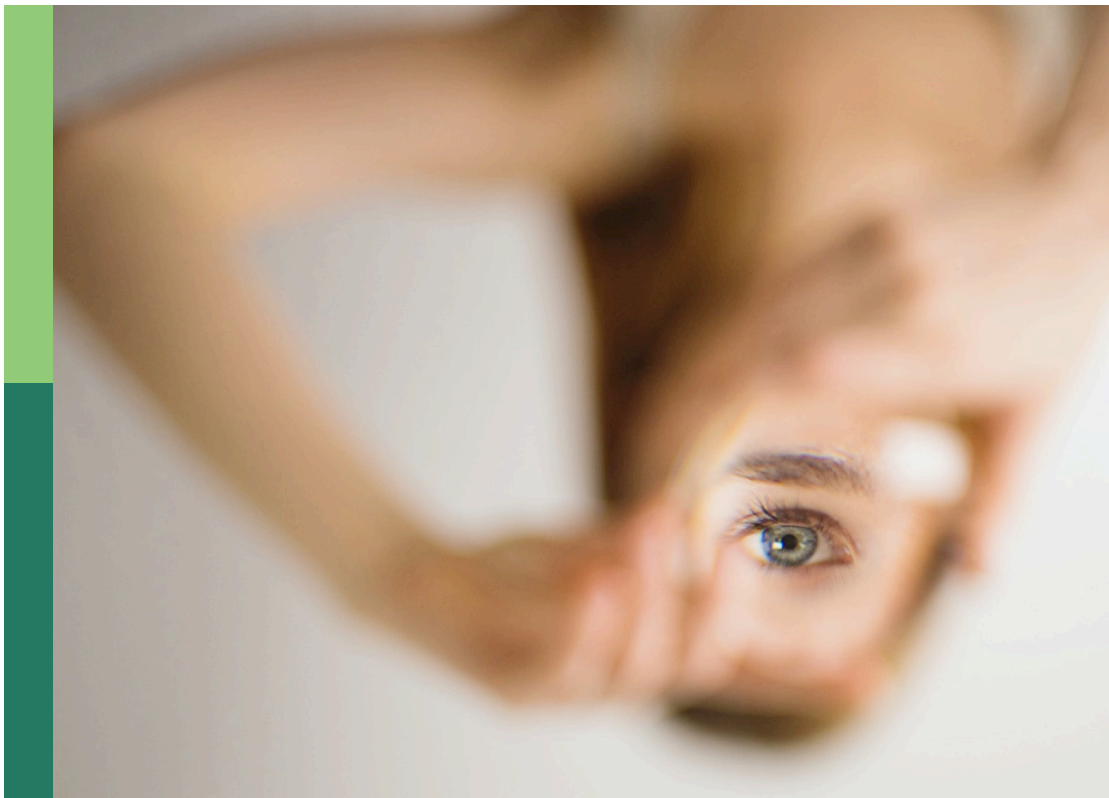
frontiers | Research Topics

The case of social emotional learning: Evidence-based practices

Edited by
Pedro Rosário and Carmel Cefai

Published in
Frontiers in Psychology
Frontiers in Education



ISSN 1664-8714
ISBN 978-2-8325-4730-4
DOI 10.3389/978-2-8325-4730-4

About Frontiers

Frontiers is more than just an open access publisher of scholarly articles: it is a pioneering approach to the world of academia, radically improving the way scholarly research is managed. The grand vision of Frontiers is a world where all people have an equal opportunity to seek, share and generate knowledge. Frontiers provides immediate and permanent online open access to all its publications, but this alone is not enough to realize our grand goals.

Frontiers journal series

The Frontiers journal series is a multi-tier and interdisciplinary set of open-access, online journals, promising a paradigm shift from the current review, selection and dissemination processes in academic publishing. All Frontiers journals are driven by researchers for researchers; therefore, they constitute a service to the scholarly community. At the same time, the *Frontiers journal series* operates on a revolutionary invention, the tiered publishing system, initially addressing specific communities of scholars, and gradually climbing up to broader public understanding, thus serving the interests of the lay society, too.

Dedication to quality

Each Frontiers article is a landmark of the highest quality, thanks to genuinely collaborative interactions between authors and review editors, who include some of the world's best academicians. Research must be certified by peers before entering a stream of knowledge that may eventually reach the public - and shape society; therefore, Frontiers only applies the most rigorous and unbiased reviews. Frontiers revolutionizes research publishing by freely delivering the most outstanding research, evaluated with no bias from both the academic and social point of view. By applying the most advanced information technologies, Frontiers is catapulting scholarly publishing into a new generation.

What are Frontiers Research Topics?

Frontiers Research Topics are very popular trademarks of the *Frontiers journals series*: they are collections of at least ten articles, all centered on a particular subject. With their unique mix of varied contributions from Original Research to Review Articles, Frontiers Research Topics unify the most influential researchers, the latest key findings and historical advances in a hot research area.

Find out more on how to host your own Frontiers Research Topic or contribute to one as an author by contacting the Frontiers editorial office: frontiersin.org/about/contact

The case of social emotional learning: Evidence-based practices

Topic editors

Pedro Rosário — University of Minho, Portugal

Carmel Cefai — University of Malta, Malta

Citation

Rosário, P., Cefai, C., eds. (2024). *The case of social emotional learning: Evidence-based practices*. Lausanne: Frontiers Media SA.

doi: 10.3389/978-2-8325-4730-4

Table of contents

frontiers | Frontiers in Psychology

TYPE Original Research
PUBLISHED 24 January 2023
DOI 10.3389/fpsyg.2022.1047022

OPEN ACCESS

EDITED BY
Pedro Rosário,
University of Minho,
Portugal

REVIEWED BY
Dayna Lee-Baggley,
Dalhousie University,
Canada
Armanda Pereira,
University of Trás-os-Montes and Alto Douro, Portugal

*CORRESPONDENCE
Júlia Halamová
julia.halamova@gmail.com

SPECIALTY SECTION
This article was submitted to Educational Psychology, a section of the journal Frontiers in Psychology

RECEIVED 17 September 2022
ACCEPTED 28 December 2022
PUBLISHED 24 January 2023

CITATION
Halamová J, Mihaľo J and Bakoš L (2023) The impact of Emotion-focused training for emotion couching delivered as mobile app on self-compassion and self-criticism. *Front. Psychol.* 13:1047022. doi: 10.3389/fpsyg.2022.1047022

The impact of Emotion-focused training for emotion couching delivered as mobile app on self-compassion and self-criticism

Júlia Halamová *, Jakub Mihaľo and Lukáš Bakoš

Faculty of Social and Economic Sciences, Institute of Applied Psychology, Comenius University in Bratislava, Bratislava, Slovakia

Introduction: Being self-compassionate is considered a beneficial emotion regulation strategy. Therefore, the acquisition of emotional skills can raise self-compassion levels and consequently reduce self-criticism.

Methods: Hence, the goal of the current study was to develop a mobile app based on the empirically proven group version of Emotion-Focused Training for Emotional Coaching (EFT-EC) and test its effectiveness in reducing self-criticism and raising self-compassion and self-protection. The sample consisted of 85 participants, of whom 22.4% were men and 77.6% were women. The mean age was 32.53 (SD=14.51), ranging from 18 to 74years. The participants filled out the following scales immediately before and after using the fourteen-day mobile app: The Forms of Self-Criticizing/Attacking & Self-Reassuring Scale (FSCRS), The Sussex-Oxford Compassion for the Self Scale (SOCS-S), and The Short-form Version of The Scale for interpersonal behaviour (s-SIB).

Results: Use of the 14-day EFT-EC mobile app significantly improved self-compassion and self-reassurance and significantly reduced self-criticism compared to pre- and post-measurements.

Discussion: The results are promising as self-criticism is a transdiagnostic phenomenon observed in various kinds of psychopathology and reducing it may prevent the emergence of psychopathologies. Moreover, the mobile app intervention can easily be accessed by a wide range of users, without requiring the services of a mental health professional, and thereby reduces the potential risk of shame or stigmatization.

KEYWORDS

self-compassion, self-criticism, self-protection, emotion, emotion focused therapy, mobile app, mHealth, MHapps

Introduction

According to Blatt and Zuroff (1992), self-criticism is constant, harsh self-scrutiny, in which the individual experiences negative emotions accompanied by feelings of unworthiness, shame, inferiority, and guilt. Elevated levels of self-criticism can lead to unhealthy perfectionism (Cox et al., 2002), shame (Gilbert and Irons, 2005), social anxiety, or post-traumatic stress disorder, and in extreme cases may cause suicidal ideations (O'Connor and Noyce, 2008). In addition, self-criticism has been linked to schizophrenia, depression, and borderline personality disorder (Blatt, 1974; Bergner, 1995). The opposite of self-criticism is self-compassion. Strauss et al. (2016) define compassion as a cognitive, affective, and behavioural process consisting of five elements: (1) recognition of suffering; (2) understanding the universality of suffering in human experience; (3) feeling empathy for the suffering person and compassion for his/her suffering (emotional resonance); (4) tolerating the discomfort elicited in response to the suffering person (e.g., restlessness, anger, fear) as well as the ability to remain open to and accept the suffering person; and (5) motivation to act to alleviate another person's suffering. Self-compassion is compassion directed at oneself in situations of personal failure, or difficult situations, and reacting with understanding and kindness toward oneself (Neff, 2003).

Self-compassion and self-criticism have an enormous effect on mental health. Traditionally self-compassionate and self-critical interventions have been carried out in face-to-face individual or group therapy sessions. Kirby et al. (2017) in their metanalysis of interventions aimed at cultivating compassion toward oneself and others found they were effective in raising self-compassion, mindfulness, and well-being and reducing depression, anxiety, and psychological distress. MacBeth and Gumley (2012) found that self-compassionate interventions reduce symptoms of depression as well as anxiety and stress. Although traditional therapy methods are effective, they are expensive, time-consuming, and geographically bound (Chandrashekar, 2018). Technological advancements have been crucial to the development of more accessible and affordable psychological interventions. For example, in an online survey Wahbeh et al. (2014) discovered that participants significantly preferred internet-delivered mindfulness meditation interventions over group and individual in-person sessions.

However, online interventions have limited accessibility too. Participants are required to use a computer, laptop, or tablet, which may not always be available. Online interventions can be accessed through a smartphone, but these online websites are often not adapted for mobile use. Mobile mental health apps (MHapps) address all of these issues (Chandrashekar, 2018). Moreover, the number of smartphone users worldwide is expected to reach 6.6 billion in 2022 and to continue growing rapidly in subsequent years (Statista, 2021). MHapps are accessible, affordable, private, and do not require the person to be at a specific location (Chandrashekar, 2018).

The trade-off with MHapps is that they are not as personalized as therapist-delivered interventions (Bakker et al., 2016). This could be partly solved by creating an environment that is individually tailored and customized to needs. Furthermore, researchers (Anthes, 2016) have raised safety issues as MHapps have not been supported by academic research and therefore there is no efficiency research or even no harm research. Anyone can create an app without the need to comply with international guidelines and rules, as these do not exist yet (Anthes, 2016). Apps that are not backed by scientific data could potentially do psychological harm to individuals (Anthes, 2016). That is why it is essential to create scientifically tested mobile apps that are affordable and that could aid a large population of people without access to in-person psychotherapy.

Emotion-focused therapy

Empirically supported methods for treating excessive self-criticism and low levels of self-compassion are emerging from the findings of Emotion-focused Therapy (EFT; Greenberg, 2011) and other related psychotherapy fields (e.g., Gilbert, 2009). According to EFT, emotions are a means of obtaining a better understanding of oneself and one's needs. Not understanding emotions and/or avoiding unpleasant ones could cause harm and lead to psychological problems (Greenberg, 2011). EFT therapists guide clients through situations to increase emotional awareness, adaptation, and regulation, and to help them transform maladaptive emotions into adaptive emotions, make better use of adaptive emotions, and cope better with maladaptive emotions. The main transformative healing process in EFT requires the evocation of self-compassion and self-protection in order to combat self-criticism (Pascual-Leone and Greenberg, 2007).

Empirical research is increasingly focused on self-compassion and self-criticism in individuals because self-compassion and self-criticism are important aspects of well-being and countering psychopathology (Ferrari et al., 2019). Research shows that EFT is an effective method for increasing self-compassion and reducing self-criticism in the non-clinical population in the prevention of mental disorders (Halamová et al., 2021). EFT therapists aim to access primary adaptive emotions because these provide useful information for tackling the situation and for meeting the needs of the individual. To counter self-criticism individuals need both to increase their self-compassion and to deploy protective anger as that encourages them to stand up for themselves (Timulak, 2015; Vrana and Greenberg, 2018).

Protective anger is an effective response to maltreatment and unmet needs (Timulak, 2015). Protective anger helps the person to gain a sense of personal power, which helps them to face painful feelings (loneliness, shame, fear, etc.) rather than avoiding them and that enables them to transform maladaptive emotions into adaptive emotions under specific guidance and facilitation. In EFT, the more often feelings of self-compassion and protective anger are incorporated into the therapy, the more emotionally

resilient and flexible the individual becomes (Timulak, 2015). It is our view that protective anger is closely related to, if not overlapping with assertiveness. Assertive people master abilities such as standing up for themselves without experiencing strong anxiety or clearly and directly expressing and verbalizing their feelings, thoughts, opinions, desires, and requirements without recourse to aggression and while respecting the rights of others (Speed et al., 2018). Assertive people have the ability not only to analyse their emotions, including the ability to clearly define their feelings, but also the ability to control their impulses and express their needs appropriately and proportionately (Stein and Book, 2006). Low levels of assertiveness can manifest in submissiveness, excessive aggression, and grumpiness toward others (Speed et al., 2018), and have been linked to depressive symptoms, social anxiety, life satisfaction, and other negative consequences (Peneva and Mavrodiev, 2013; Speed et al., 2018).

Interventions research

These concepts self-criticism, self-protection, and self-compassion are an essential part of emotional training and are key elements of resolving emotional imbalance (Heffernan et al., 2010). Currently, several interventions target these issues. Compassion Mind Training, which is based on Compassion-focused Therapy (CFT; Gilbert, 2009), aims to enhance psychological and emotional healing through understanding and feeling compassion for oneself during negative thought processes, while focusing on nourishing compassion within the self. CFT helps individuals with a highly self-critical 'inner voice' develop a more compassionate point of view in situations of suffering. An early systematic review of CFT effectiveness concluded that this therapeutic method is effective in reducing high levels of self-criticism (Leaviss and Uttley, 2014). Another intervention dealing with emotion is Cultivating Emotional Balance (CEB; Kemeny et al., 2012), which uses emotional training to help individuals experience and express emotions toward themselves and others and reduce negative emotional states. CEB integrates scientific knowledge (understanding of emotions, emotion triggers, experience, and consequences), Eastern contemplative practices, and philosophy of emotion. Participants undertake 42 h of topic presentations, group and pair discussions, guided practice exercises in meditation, and emotion regulation training. Empirical findings suggest that CEB may help individuals improve the regulation of emotions, and enhance mindfulness, self-care, and self-compassion capabilities (Kemeny et al., 2012; Sansó et al., 2017).

As stated previously, these interventions are almost exclusively delivered through face-to-face sessions (Gilbert, 2009; Greenberg, 2011; Kemeny et al., 2012). However, recently a couple of papers have explored the use of technologies (mostly online interventions) in self-compassionate training. Finlay-Jones et al. (2016) created an online platform focused on individual self-compassionate intervention. Participants were psychology students, and the intervention had a significant positive effect, increasing self-compassion and happiness, and reducing depressiveness, distress, and emotional regulation. Another study (Krieger et al., 2016) deployed an online self-compassion-based intervention among people with excessive self-criticism. Researchers found a significant long-term (3.5 months) reduction in self-criticism, stress, fear of self-compassion, and elevated self-compassion, life satisfaction, and mindfulness. Similarly, Eriksson et al. (2018) tested the effectiveness of online mindfulness-compassion training on stress and professional burnout amongst practicing psychologists. They measured outcomes in self-compassion and mindfulness, self-coldness, stress, and professional burnout. The online web intervention had a significant positive effect on all of these. Recently, research teams have attempted to create empirically supported MHapps for self-compassion. Mak et al. (2018) concluded that mindfulness, self-compassionate, and cognitive behavioural psychoeducation delivered through a mobile app was appropriate for improving mental well-being and reducing stress over the long-term. Linardon et al. (2019) reviewed the recent literature and in his meta-analytic review concluded that self-compassion and mindfulness could be elevated through MHapps. Orosa-Duarte et al. (2021) compared the effect of the mindfulness MHapp versus face-to-face mindfulness intervention among a student healthcare population. The mobile app group outperformed the in-person intervention group in terms of reduced anxiety. Both intervention groups reported a significant increase in self-compassion and mindfulness.

Elevated levels of self-compassion and lower self-criticism correlate with higher scores on happiness and well-being scales (Zessin et al., 2015). According to Gilbert and Irons (2004), self-criticism can be treated by cultivating compassion and self-compassion. Furthermore, Kemeny et al. (2012) proposed that the acquisition of emotional skills can raise levels of compassion and self-compassion. This was further supported by Heffernan et al. (2010), who confirmed a relationship between emotional intelligence and self-compassion. Moreover Beaumont et al. (2016) discovered a relation between self-compassion and emotional resilience. The protective role of self-compassion helps reduce chronic stress and its effect on emotional responses (Neff and Vonk, 2009). Neff (2003) considers self-compassion to be a beneficial emotional regulation strategy. That is, negative emotions, psychological distress, and painful feelings are accepted through kindness, understanding, and a non-judgmental attitude. Maslow (1997) argued that emotional maturity is associated with non-judgmental being, forgiveness, and acceptance of oneself as well as others. This is further supported by Neff and Vonk, 2009, who claimed that self-compassion is strongly linked to emotional intelligence and wisdom. In addition, Lazarus and Folkman (1984) have argued that people high in compassion often adopt emotional and adaptive coping responses to stress. Furthermore, self-compassion is positively linked with emotionally focused adaptive coping strategies and negatively associated with maladaptive coping responses in those faced with failure (Lazarus and Folkman, 1984). Similarly, a sample of participants with high

self-compassion were more likely to transform negative emotional states into positive ones, which results in action and appropriate adaption and change (Carver and Connor-Smith, 2010). Hence, we wanted to know whether cultivating emotional intelligence skills would have an impact on self-criticism and self-compassion (Halamová and Kanovský, 2019) and possibly self-protection.

As there was no existing mobile app focusing on the emotional aspects of individual mental health, we decided to create an app empirically supported by the latest EFT research findings and delivered through an affordable and available intervention targeting a negative aspect of high self-criticism and low self-compassion. We therefore selected an intervention by Halamová and Kanovský (2019), who created the Emotion-Focused Training for Emotional Coaching (EFT-EC), which integrates modules on emotional intelligence, self-compassion, and self-criticism. The training was developed using up-to-date knowledge on Emotion-Focused Therapy and previous empirical research and consists of 14 individual home exercises, as well as groups sessions, discussions, and group activities. The results showed a significant effect on participants' self-criticism and self-control levels. We decided to create a mobile app that would provide an affordable, empirically supported, and easy-to-access online intervention for emotional training.

The aim of the research study

Hence, our goal was to develop a mobile app of the original group version of the empirically supported Emotion-Focused Training for Emotional Coaching (EFT-EC; Halamová and Kanovský, 2019) and test its effectiveness in reducing self-criticism and raising self-compassion and self-protection. Based on this, our hypotheses were:

1. the EFT-EC intervention will significantly raise participants' self-compassion.
2. the EFT-EC intervention will significantly reduce participants' self-criticism.
3. the EFT-EC intervention will significantly raise participants' self-protection/assertiveness.

Methods

The research sample

The sample consisted of 85 Slovak-speaking participants (82 Slovak, 2 Czech, 1 Hungarian), of whom 22.4% were men and 77.6% were women. Mean age was 32.53 (SD = 14.51), ranging from 18 to 74 years. In total our sample contained 218 participants who had registered for the app. The drop-out rate was 61.0%. Regarding the 133 incomplete interventions, most participants did not finish any of the tasks (39.7%), 16.5% of participants dropped out on the second day, 20.3% on the third day, 3.8% on the fourth day, 0% on the fifth day, 6.8% on the sixth day, 0.8% on the seventh day, 3.8% on the eight day, 3% on the nineth day, 1.5% on the tenth day, 0% on the eleventh day, 0% on the twelfth day, 0 the thirteenth day, and 0% on the last day. Furthermore 3.8% participants completed the whole intervention and all exercises but did not complete the intervention questionnaires at post-measurement. Presented drop-out rates are slightly higher than other mental health studies leveraging mobile apps to distribute interventions (Torous et al., 2020) and comparable to internet interventions of Mellor et al. (2008). All participants completed an online informed consent form. Data were collected in accordance with the ethical standards of the institutional and/or national research committee and following the 1964 Helsinki Declaration and its later amendments or comparable ethical standards. The study protocol was approved by the ethical committee of a related university.

Measurement instruments

The Forms of Self-Criticizing/Attacking and Self-Reassuring Scale

The Forms of Self-Criticizing/Attacking and Self-Reassuring Scale (FSCRS) scale was developed by Gilbert et al. (2004) and will be used to measure self-criticism and self-reassurance among the mobile app participants. The scale consists of 22 items measuring three components: Reassured Self (RS), Inadequate Self (IS), and Hated Self (HS). Inadequate Self and Hated Self (IS+HS) measure personal inadequacy and the desire to hurt oneself, respectively, and together sum up to a single self-criticism score. Reassured Self focuses on being able to forgive oneself, which is similar to self-compassion. The items are rated on a 5-point Likert scale ranging from 0 ("Not at all like me") to 4 ("Extremely like me"). Example scale items are: for Inadequate Self – *"I remember and dwell on my failings,"* for Reassured Self – *"I am gentle and supportive with myself,"* and for Hated Self – *"I have become so angry with myself that I want to hurt or injure myself."* The internal consistency of the total FSCRS was excellent, $\alpha = 0.90$ (Baião et al., 2014). The analysis of the subscales revealed values of 0.82 (Reassured Self), 0.86 (Inadequate Self), and 0.80 (Hated Self) (Baião et al., 2014). In addition, the FSCRS scale showed very good psychometric properties in terms of reliability, validity, and factor structure when tested on a Slovak population sample (Halamová et al., 2017). The analysis of the results for the Slovak population showed values of 0.85 (Inadequate Self), 0.75 (Hated Self), and 0.75 (Reassured Self) (Halamová et al., 2017).

The Sussex-Oxford Compassion for the Self Scale

The Sussex-Oxford Compassion for the Self Scale (SOCS-S) was developed by Gu et al. (2020) and was used in this study to measure participant levels of self-compassion. This scale is based on a theoretically and empirically supported definition of compassion comprising five dimensions: (a) recognizing suffering

(RS), (b) understanding the universality of suffering (US), (c) feeling for the person suffering (FS), (d) tolerating uncomfortable feelings (TS), and (e) motivation to act/acting to alleviate suffering (MA). The items are rated on a 5-point Likert scale ranging from 1 ("Not at all true") to 4 ("Always true"). Example scale items include: for Recognizing Suffering – *"I recognise signs of suffering in myself,"* for Understanding the Universality of Suffering – *"Like me, I know that other people also experience struggles in life,"* for Feeling for the Person Suffering – *"When I'm going through a difficult time, I feel kindly towards myself,"* for Tolerating Uncomfortable Feelings – *"I connect with my own suffering without judging myself,"* and for Motivation to Act/Acting to Alleviate Suffering – *"I try to make myself feel better when I'm distressed, even if I cannot do anything about the cause."* The results of the psychometric analysis of the scale showed adequate internal consistency, interpretability, floor/ceiling effects, and convergent and discriminant validity (Gu et al., 2020). The SOCS scales were translated and tested on the Slovak population (Halamová and Kanovský, 2021). The results of the analysis showed good psychometric properties for both subscales (Halamová and Kanovský, 2021) – Compassion for Others ($\alpha = 0.93$) and Compassion for the Self ($\alpha = 0.89$).

The short version of the Scale for Interpersonal Behavior

The short-form version of the Scale for Interpersonal Behaviour (s-SIB; Arrindell et al., 2002) was developed to measure levels of Negative Assertion (standing up for oneself), Positive Assertion (ability to give and receive praise), Initiating Assertiveness (ability to socialize in everyday situations), and Expression of and Dealing with Personal Limitations (dealing with pressure, recognizing one's failure, failures, and criticism). A total of 25 items are rated on a 5-point Likert scale on two different measures – Distress (s-SIB), which is the discomfort participants feel in the situation described in the particular item (not at all, somewhat, rather, very, and extremely) and Performance (s-SIBF), which the is frequency of the described behaviour (I never do, I rarely do, I sometimes do, I usually do, I always do). Example scale items include: for Negative Assertions (NA for distress, FNA for performance) – "Refusing to lend something to a near acquittance," for Expression and Dealing with Personal Limitations – "Asking someone to show you the way," for Initiation Assertiveness (IA for distress, FIA for performance) – "Giving your opinion to a person in authority," and for Positive Assertions (PA for distress, FPA for performance) – "Telling someone that you like him/her." The s-SIB scales were translated and tested on the Slovak population (Vráblová and Halamová, 2022). The results of the analysis showed good psychometric properties: Cronbach α coefficients for all subscales were – Positive Assertion (distress $\alpha = 0.93$ and performance $\alpha = 0.94$), Negative Assertion (distress $\alpha = 0.83$ and performance $\alpha = 0.82$), Initiating Assertiveness (distress $\alpha = 0.83$ and performance $\alpha = 0.81$), and Expression of and Dealing with Personal Limitations (distress $\alpha = 0.79$ and performance $\alpha = 0.81$). The results of the Mokken analysis supported using the total scores for s-SIB distress and s-SIB performance and their subscales.

EFT-EC mobile application

The participants of the EFT-EC intervention undertook a 14-day intervention, where the goal was to raise self-compassion and self-protection and reduce self-criticism. Each task began with a short psychoeducational section that provided basic information about the task at hand. All 14 tasks took approximately 15 min to complete. Participants were asked questions and had to reply using expressive writing to deepen the effect of the intervention (Pennebaker and Beall, 1986; Pennebaker, 2017). At the end of each task, we asked the following questions: How did you feel during the exercise? (emotional aspect). What did you realize during the exercise? (cognitive aspect). What can you take from the exercise for use in everyday life? (behavioural aspect). Participants could complete one task only within a 24-h period so as to give them time for reflection and to space out the tasks. This also served as a check on participants' commitment to the intervention. The mobile app was internet based and did not work offline as it was necessary to collect data about the participants.

The EFT-EC intervention is focused on raising awareness of emotions and current behavioural patterns toward oneself and other people in everyday situations. Participants are taught effective and healthy ways to cope with and manage emotions and to enhance their emotional intelligence, which often results in better work performance and relationship satisfaction. Participants who completed the intervention could compare their pre and post-intervention scores using interactive graphs. The scores were calculated from the initial and post-intervention questionnaire responses. This provided participants with a motivational tool and a tangible result.

Day 0: Initial measures

Pre-measurements.

Day 1: Examining my emotional closeness in relationships (inspired by Gottman and Silver, 2000; Johnson, 2011; Halamová and Kanovský, 2019)

This exercise consists of questions exploring the participants' attitudes to their emotions based on their upbringing, sociocultural background, and the way they form emotional closeness to loved ones or how comfortable they are with asking for closeness or other needs to be met in their relationships.

Day 2: Self-soothing with sensory perception [inspired by Halamová and Kanovský (2019), Linehan (1993), and Segal (2008)]

The goal of this exercise is to find ways to calm down using readily available tools such as using one's senses to calm oneself down and induce a pleasant feeling. During this exercise, participants can explore a wide range of sensory sensations through motion, sight, hearing, touch, smell, and taste.

Day 3: Safe space [inspired by Greenberg and Warwar (2006) and Halamová and Kanovský (2019)]

Imagining a safe place is another way of preparing to cope with the potential stress of waves of feelings. Participants are

instructed to imagine a safe space they can always return to. The purpose of this guided meditation is to teach participants how to calm themselves down in stressful situations.

Day 4: Raising emotional awareness [inspired by Greenberg (2002) and Halamová and Kanovský (2019)]

The goal of this exercise is for participants to learn to identify more precisely what they feel in any given situation (through becoming aware of situations, triggers, thoughts, body sensations, needs, desired behaviour, actual behaviour, and by naming their felt emotions).

Day 5: Distinguishing between primary and secondary emotions and between adaptive and maladaptive emotions [inspired by Halamová (2013) and Halamová and Kanovský (2019)]

Through this exercise, participants will learn to distinguish between primary and secondary emotions as well as between adaptive and maladaptive emotions. Participants are guided through choosing the most intense emotion and answer questions relating to the emotion.

Day 6: Focusing [inspired by Gendlin (1996), Halamová and Kanovský (2019), and McGuire (2007)].

This exercise involves creating a felt sense and using it to better understand inner experiences or to solve problems.

Day 7: Emotion expression [inspired by Ekman (2012), Greenberg (2002), and Halamová and Kanovský (2019)].

These exercises involve recalling a recent situation in which participants felt intense anger. After that participants are instructed to let the emerging feelings grow as strong as possible and to observe the changes to their body and face. Afterwards they are asked to describe the verbal and nonverbal signs of the emotion and compare their own expressions of anger with scientific findings about how anger is usually expressed. The same exercise is then performed with the emotion joy.

Day 8: Articulating the relationship needs behind primary emotions [inspired by Halamová (2013), Halamová and Kanovský (2019), and Johnson (2011)].

This exercise helps participants to identify the needs behind their emotions in a selected situation and what they need in the given situation and to articulate it.

Day 9: Compliments [inspired by Halamová (2013)].

This exercise teaches participants to give compliments to loved ones. Participants are instructed to think about the emotion they feel and then make a list of things that they appreciate about their loved ones and then compliment them. The compliment should be specific and relate to appearance, qualities, behaviour, skills, experience, relationships, values, performance, personality, character, etc.

Day 10: Complaints [inspired by the Gottman Institute (2011) and Halamová (2013)].

Based on research by the Gottman Institute (2011), this exercise teaches participants the skill of complaining constructively. The exercise involves learning a structure for formulating complaints and then practicing applying that structure to a series of past regrets.

Day 11: Apology [inspired by Dolhanty (2021) and Halamová and Kanovský (2019)].

During this exercise, participants are coached on how to apologize: what they need to say to somebody when they regret not having said something at the time the regrettable event happened.

Day 12: Empathetic understanding [inspired by Dolhanty (2021) and Halamová (2013)].

The exercise teaches participants how to be empathetic when talking to other people. The exercise involves learning a structure for formulating empathetic responses and then practicing applying that structure to a series of past relationship situations.

Day 13: Facilitating emotional change [inspired by Halamová (2013) and Pascual-Leone (2017)].

Participants are guided toward remembering a situation from the recent past that is emotionally discomforting. They are instructed to answer several questions about their emotional state and the exercise helps them facilitate an emotional change in the situation.

Day 14: Self-care [inspired by Ellison and Greenberg (2007) and Halamová (2013)].

At the end of an intervention, it is usually essential that participants are able to cope with a period of higher stress levels. It helps to prepare thoroughly for such periods in advance (Halamová et al., 2019). This exercise helps participants to cope with difficult moments and overcome the feelings of elevated vulnerability that often accompany stressful situations.

Day 15–18: after-intervention measures.

Post-measurements.

Data analyses

The data analysis was performed using IBM SPSS statistics program version 27 (IBM Corporation, 2020). Cronbach alpha was calculated to assess the reliability of each scale and subscale. After that, we deployed the Shapiro-Wilks Normality test to calculate the data distribution. See the results in Appendix 1. Where the data distribution was not violated, we used paired t-Tests and calculated Cohen's d for effect size results. Where the data distribution was not normal, we deployed the Wilcoxon signed-rank test and the Mann–Whitney U test to calculate the effect size.

Results

The reliability analysis of the exploited scales and their subscales showed the following results: for FSCRS IS 0.877; RS 0.824; HS 0.700; IS+HS 0.885, for SOCS 0.856; RS 0.814; US 0.768; FS 0.687; TS 0.759; MA 0.712, for s-SIB distress 0.932; NA 0.756; PL 0.762; IA 0.694; PA 0.761, and for s-SIB performance 0.907; FNA 0.715; FPL 0.753; FIA 0.627; FPA 0.676. All were at an acceptable level.

Self-compassion

A statistically significant effect of medium strength was obtained for the total score of self-compassion, $t = -3{,}358$; $df = 82$;

$p = 0{,}001$; $d = 0.52$, and for the subscales (FS) feeling for the person suffering $Z = -3{,}203$; $p = 0{,}001$; $r_m = 0.35$ and (MA) motivation to act/acting to alleviate suffering $Z = -3{,}063$; $p = 0{,}002$; $r_m = 0.34$. For the (RS) recognizing suffering subscale there was a statistically significant effect of small strength $Z = -2{,}369$; $p = 0{,}018$; $r_m = 0.26$. There was no statistically significant difference between the pre-test and post-test scores for (US) understanding the universality of suffering ($Z = -0{,}702$; $p = 0{,}482$; $r_m = 0.03$) and (TS) tolerating uncomfortable feelings ($t = -1{,}964$; $df = 82$; $p = 0{,}053$; $d = 0.31$).

Self-criticism

We found a statistically significant and medium size effect for self-criticism (IS+HS) in the pre-test and post-test measurements, $t = 3{,}569$; $df = 82$; $p = 0{,}001$; $d = 0.55$; and for the subscales (IS) Inadequate Self, $t = 3{,}420$; $df = 82$; $p = 0{,}000$; $d = 0.61$ and (RS) Reassured Self, $Z = -4{,}970$; $p = 0{,}000$; $r_m = 0.55$. There was no statistically significant difference between the pre-test and post-test scores for the Hated Self subscale ($Z = -1{,}788$; $p = 0{,}074$; $r_m = 0.20$).

Self-protection/assertiveness

We did not find a statistically significant difference between the pre-test and post-test measurements for the total assertiveness score ($t = 1{,}444$; $df = 82$; $p = 0{,}153$; $d = 0.23$), or any of the s-SIB distress dimensions (NA) Negative Assertions ($t = 0{,}568$; $df = 82$; $p = 0{,}572$; $d = 0.09$), (PL) Expression of and Dealing with Personal Limitations ($Z = -1{,}418$; $p = 0{,}156$; $r_m = 0.16$), (IA) Initiating Assertiveness ($t = 3{,}420$; $df = 82$; $p = 0{,}081$; $d = 0.53$), and (PA) Positive Assertions ($t = 1{,}227$; $df = 82$; $p = 0{,}223$; $d = 0.19$).

Similarly, there was no significant difference in the total s-SIB performance score ($t = 0{,}025$; $df = 82$; $p = 0{,}980$; $d = 0.00$), or any of its subscales (FNA) Negative Assertions ($t = -0{,}428$; $df = 82$; $p = 0{,}670$; $d = 0.07$), (FPL) Expression of and Dealing with Personal Limitations ($t = 0{,}022$; $df = 82$; $p = 0{,}982$; $d = 0.00$), (FIA) Initiating Assertiveness ($t = -0{,}432$; $df = 82$; $p = 0{,}667$; $d = 0.07$), and (FPA) Positive Assertions ($t = 0{,}894$; $df = 82$; $p = 0{,}374$; $d = 0.14$).

Discussion

The aim of the research study was to develop a mobile app based on the original group training called Emotion-Focused Training for Emotional Coaching (EFT-EC; Halamová and Kanovský, 2019) and to test its effectiveness in reducing self-criticism and raising self-compassion and self-protection. Based on the results, we found support for its effectiveness in relation to self-criticism and self-compassion, but not self-protection.

We found a statistically significant effect for the total self-compassion score (SOCS-S) as well its subscales (FS) feeling for the person suffering, (MA) motivation to act/acting to alleviate suffering, and (RS) recognizing suffering. The app focused on learning emotional skills so it is understandable that participants were better able to recognize suffering and feel more for the suffering person, which could lead to enhanced motivation to help. The EFT-EC intervention incorporated questions about cognitions, emotions, and behaviours and probed participants to reflect on these three aspects of life. This could have heightened the positive effect of the intervention on participants as they may have processed the knowledge gained more effectively. No effect was found for the dimensions of (US) understanding the universality of suffering and (TS) tolerating uncomfortable feelings as the app did not deal with universality. The focus was more on emotional awareness rather than directly tolerating feelings.

Our results revealed a positive effect on the total score for self-criticism and the subscales (IS) Inadequate Self and (RS) Reassured Self. No effect was found in the hated-self dimensions but that is not surprising given its clinical nature and the more severe symptoms of the population scoring high on this dimension (Gilbert et al., 2004). Both self-criticism and self-compassion affect individuals greatly. Self-compassionate individuals are happier (Zessin et al., 2015) and better able to cope with stress and anxiety (Neff et al., 2007). Our results suggest that learning emotional skills could improve emotional skills but also self-compassion and self-criticism, which could yield greater happiness and better coping skills.

We have confirmed the previous empirical finding (Heffernan et al., 2010; Kemeny et al., 2012) that individuals can cultivate self-compassion by learning emotional skills. Even though just two of the tasks in the intervention focused directly on self-compassion, the intervention mediated the unforgiving side of self-critical thoughts (Gilbert and Irons, 2005). We also found that use of the short mobile intervention could enhance emotional intelligence, exert a direct positive effect on self-compassion (Heffernan et al., 2010), and possibly has an effect on emotional resilience as well (Beaumont et al., 2016). Empirical findings suggest that cultivating the protective role of self-compassion can reduce chronic stress and its impact on emotional responses (Lazarus and Folkman, 1984; Neff and Vonk, 2009) and transform negative emotional states (Carver and Connor-Smith, 2010). We found a similar effect, as the use of self-compassion is a beneficial emotional regulation strategy (Neff, 2003) that signifies emotional maturity (Maslow, 1997) and could be learned by leveraging low-cost, accessible online intervention delivered through a mobile app. Similarly to the findings of Kemeny et al. (2012) we found that by cultivating emotional balance we were able to foster self-compassion capabilities (Kemeny et al., 2012; Sansó et al., 2017).

We were able to successfully incorporate Emotion Focus Therapy methods into an accessible online intervention that had a positive effect on self-compassion and self-criticism. However, it did not have a significant effect on self-protection or assertiveness. This could be explained by the absence of direct exercises on self-protection. Only two tasks – Complaints and, to some extent, Articulating the Relationship Needs Behind Primary

Emotions – were related to self-protection. Specific interventions with more assertiveness and self-protection tasks could perhaps obtain more significant results in this dimension, as healthy self-protection has wide-ranging benefits. In order to effectively raise self-protection, the EFT-EC mobile app should include exercises for developing these skills. A lack of self-protective and assertive behaviours may result in submissiveness, excessive aggression, negative emotions (Speed et al., 2018), or even depressive symptoms, social anxiety, and affect life satisfaction (Peneva and Mavrodiev, 2013; Speed et al., 2018).

Our research study did not confirm that learning emotional intelligence skills is not closely related assertiveness or self-protection skills; although some scholars propose that assertiveness is part of emotional intelligence [see Bar-On (1997)].

Traditionally, self-compassion and self-criticism interventions have been delivered in face-to-face group therapy settings (e.g., CFT, Gilbert, 2009; CEB, Kemeny et al., 2012). This creates an effective, but time-consuming and expensive solution to the problem (Chandrashekar, 2018). Like previous studies (Finlay-Jones et al., 2016; Eriksson et al., 2018; Mak et al., 2018; Linardon et al., 2019) we found that it is possible to increase self-compassion and reduce self-criticism by offering short online mobile apps or online-based apps. These are a cost-effective easy-to-administer solution that has a positive effect by raising self-compassion, mindfulness, and well-being and by reducing depression, anxiety, and psychological distress (MacBeth and Gumley, 2012; Kirby et al., 2017). Some people prefer online interventions as there are barriers to traditional therapy sessions (cost, negative stigma, unavailability, lack of anonymity; Wahbeh et al., 2014). Nonetheless, online interventions have many drawbacks, such as data safety and the absence of empirical research, and lack the personal touch that is reminiscent of human interaction (Anthes, 2016; Bakker et al., 2016).

Limitations

The study design did not include a control group and so we could not statistically assess the effect by comparing active and passive participants. Therefore, there is a possibility that the changes could be attributed to the time and not the intervention itself. In addition, the mobile app was tested in one particular language and culture. It would be good to translate the app and see how it works in different languages. Finally, the participants were self-selected and there was no feedback so we can only speculate as to the reason for the premature dropout rate.

Future studies

Future research could focus on effectiveness of this intervention and/or app design in different cultures or with subjects speaking different languages. Currently, we are in the process of gathering data from culturally non-specific English-speaking participants. In addition, we suggest measurement of emotion intelligence in future so it is tested whether the intervention significantly increase the ability to process emotions which is the main target of the intervention based on its name and the content.

Conclusion

The 14-day mobile app based on the empirically supported Emotion Focused Training for Emotion Couching (EFT-EC) significantly improved self-compassion and self-reassurance, and significantly reduced self-criticism, comparing pre-and post-measurements. The results are promising as reducing self-criticism, a transdiagnostic phenomenon of various kinds of psychopathology, could prevent the emergence of psychopathologies. Furthermore, the mobile app intervention could be made easily accessible to a wide range of users without having to involve a mental health professional and hence without the potential risk of shame or stigmatization.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Ethics statement

The studies involving human participants were reviewed and approved by The Ethical Committee of Faculty of Social and Economic Sciences, Comenius University in Bratislava. The patients/participants provided their written informed consent to participate in this study.

Author contributions

JH designed the intervention and JM performed the statistical analysis. JH and JM designed research. JM, JH, and LB collected data. All authors wrote the first draft of the article, interpreted the results, revised the manuscript, and read and approved the final manuscript.

Funding

This study was supported by the Vedecká grantová agentúra VEGA under Grant 1/0075/19 and the Slovak Research and Development Agency under the Contract no. PP-COVID-20-0074.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Publisher's note

References

Anthes, E. (2016). Mental health: There's an app for that. *Nature* 532, 20–23. doi: 10.1038/532020a

Arrindell, W. A., Sanavio, E., and Sica, C. (2002). Introducing a short form version of the Scale of Interpersonal Behaviour (s-SIB) for use in Italy. Psicoterapia Cognitiva e Comportamentale. 8, 3–18.

Baião, R., Gilbert, P., McEwan, K., and Carvalho, S. (2014). Forms of self-criticising/attacking & self-reassuring scale: psychometric properties and normative study. *Psychol. Psychother. Theory Res. Pract.* 88, 438–452. doi: 10.1111/papt.12049

Bakker, D., Kazantzis, N., Rickwood, D., and Rickard, N. (2016). Mental health smartphone apps: review and evidence-based recommendations for future developments. *JMIR Mental Health* 3:e7. doi: 10.2196/mental.4984

Bar-On, R. (1997). *The Emotional Intelligence Inventory (EQ-I). Technical Manual*. Toronto: Multi-Health systems.

Beaumont, E., Irons, C., Rayner, G., and Dagnall, N. (2016). Does compassion-focused therapy training for health care educators and providers increase self-compassion and reduce self-persecution and self-criticism? *J. Contin. Educ. Health Prof.* 36, 4–10. doi: 10.1097/CEH.0000000000000023

Bergner, R. M. (1995). *Pathological Self-Criticism: Assessment and Treatment*. New York: Plenum Press.

Blatt, S. J. (1974). Levels of object representation in anaclitic and introjective depression. *Psychoanal. Study Child* 29, 107–157. doi: 10.1080/00797308.1974.11822616

Blatt, S. J., and Zuroff, D. C. (1992). Interpersonal relatedness and self-definition: two prototypes for depression. *Clin. Psychol. Rev.* 12, 527–562. doi: 10.1016/0272-7358(92)90070-o

Carver, C. S., and Connor-Smith, J. (2010). Personality and coping. *Annu. Rev. Psychol.* 61, 679–704. doi: 10.1146/annurev.psych.093008.100352

Chandrashekar, P. (2018). Do mental health mobile apps work: evidence and recommendations for designing high-efficacy mental health mobile apps. *Mhealth* 4:6. doi: 10.21037/mhealth.2018.03.02

Corporation, IBM. (2020). *IBM SPSS statistics for windows, version 27.0*. Armonk, NY: IBM Corp.

Cox, B. J., Walker, J. R., Enns, M. W., and Karpinski, D. C. (2002). Self-criticism in generalized social phobia and response to cognitive-behavioral treatment. *Behav. Ther.* 33, 479–491. doi: 10.1016/s0005-7894(02)80012-0

Dolhanty, J. (2021). Emotion focused skills training. Unpublished materials.

Ekman, P. (2012). Emotions revealed. New York: Holt Paperbacks.

Ellison, J. A., and Greenberg, L. S. (2007). "Emotion-focused experiential therapy" in *Handbook of Homework Assignments in Psychotherapy*. eds. N. Kazantzis and L. L'Abate (New York, NY: Springer), 65–83.

Eriksson, T., Germundsjö, L., Åström, E., and Rönnlund, M. (2018). Mindful self-compassion training reduces stress and burnout symptoms among practicing psychologists: a randomized controlled trial of a brief web-based intervention. *Front. Psychol.* 9:2340. doi: 10.3389/fpsyg.2018.02340

Ferrari, M., Hunt, C., Harrysunker, A., Abbott, M. J., Beath, A. P., and Einstein, D. A. (2019). Self-compassion interventions and psychosocial outcomes: a meta-analysis of RCTS. *Mindfulness* 10, 1455–1473. doi: 10.1007/s12671-019-01134-6

Finlay-Jones, A., Kane, R., and Rees, C. (2016). Self-compassion online: a pilot study of an internet-based self-compassion cultivation program for psychology trainees. *J. Clin. Psychol.* 73, 797–816. doi: 10.1002/jclp.22375

Gendlin, E.T. (1996). *Focusing Psychotherapy: A Manual of the Experiential Method*. New York: Guilford.

Gilbert, P. (2009). *The Compassionate Mind: A New Approach to the Challenges of Life*. London: Constable & Robinson.

Gilbert, P., Clark, M., Hempel, S., Miles, J. N. V., and Irons, C. (2004). Criticising and reassuring oneself: an exploration of forms, styles and reasons in female students. *Br. J. Clin. Psychol.* 43, 31–50. doi: 10.1348/014466504772812959

Gilbert, P., and Irons, C. (2004). A pilot exploration of the use of compassionate images in a group of self-critical people. *Memory* 12, 507–516.

Gilbert, P., and Irons, C. (2005). "Compassionate mind training, for shame and self-attacking, using cognitive, behavioral, emotional and imagery interventions" in *Compassion: Conceptualizations, Research, and Use in Psychotherapy*. ed. P. Gilbert (London: Brunner-Routledge), 263–325. doi: 10.4324/9780203003459-15

Gottman Institute (2011). How to complain without hurting your partner. Available at: http://www.youtube.com/watch?v=bShsyKUFjKE

Gottman, J. M., and Silver, N. (2000). *The Seven Principles for Making Marriage Work: A Practical Guide from the Country's Foremost Relationship Expert*. New York: Three Rivers Press.

Greenberg, L. (2002). *Emotion-Focused Therapy: Coaching Clients to Work through Feelings*. Washington, D.C.: American Psychological Association Press.

Greenberg, L. S. (2011). *Emotion-Focused Therapy*. Washington, DC: American Psychological Association.

Greenberg, L. S., and Warwar, S. H. (2006). Homework in an emotion-focused approach to experiential therapy. *J. Psychother. Integr.* 16, 178–200. doi: 10.1037/1053-0479.16.2.178

Gu, J., Baer, R., Cavanagh, K., Kuyken, W., and Strauss, C. (2020). Development and psychometric properties of the Sussex-Oxford compassion scales (SOCS). *Assessment* 27, 3–20. doi: 10.1177/1073191119860911

Halamová, J. (2013). *Terapia zameraná na emócie I. Učebnica*. Bratislava: Vydavateľstvo UK.

Halamová, J., and Kanovský, M. (2019). Emotion-focused training for emotion coaching - an intervention to reduce self-criticism. *Hum. Aff.* 29, 20–31. doi: 10.1515/humaff-2019-0003

Halamová, J., and Kanovský, M. (2021). Factor structure of the Sussex-Oxford Compassion Scales. *Psihologijske Teme* 30, 489–508. doi: 10.31820/pt.30.3.5

Halamová, J., Kanovský, M., and Pacúchová, M. (2017). Robust psychometric analysis and factor structure of the Forms of Self–criticizing/Attacking and Self–reassuring Scale. *Česk. Psychol.* 61, 331–349.

Halamová, J., Kanovský, M., Varšová, K., and Kupeli, N. (2021). Randomised controlled trial of the new short-term online emotion focused train-ing for self-compassion and self-protection in a nonclinical sample. *Curr. Psychol.* 40, 333–343. doi: 10.1007/s12144-018-993

Halamová, J., Kanovský, M., Kóróniová, J., Kénesy Túniyová, M., and Kupeli, N. (2019). Psychological and physiological effects of emotion focused training for self-compassion and self-protection. *Res. Psychother.* 22, 265–280. doi: 10.4081/ripppo.2019.358

Heffernan, M., Quinn, M. T., McNulty, R., and Fitzpatrick, J. J. (2010). Self compassion and emotional intelligence in nurses. *Int. J. Nurs. Pract.* 16, 366–373. doi: 10.1111/j.1440-172X.2010.01853.x

Johnson, S. M. (2011). *Hold me tight*. London: Piatkus.

Kemeny, M. E., Foltz, C., Cavanagh, J. F., Cullen, M., Giese-Davis, J., Jennings, P., et al. (2012). Contemplative/emotion training reduces negative emotional behavior and promotes prosocial responses. *Emotion* 12, 338–350. doi: 10.1037/a0026118

Kirby, J. N., Tellegen, C. L., and Steindl, S. R. (2017). A meta-analysis of compassion-based interventions: current state of knowledge and future directions. *Behav. Ther.* 48, 778–792. doi: 10.1016/j.beth.2017.06.003

Krieger, T., Martig, D. S., van den Brink, E., and Berger, T. (2016). Working on self-compassion online: a proof of concept and feasibility study. *Internet Interv.* 6, 64–70. doi: 10.1016/j.invent.2016.10.001

Lazarus, R. S., and Folkman, S. (1984). *Stress, Appraisal, and Coping*. New York, NY: Springer Publishing Company.

Leaviss, J., and Uttley, L. (2014). Psychotherapeutic benefits of compassion-focused therapy: an early systematic review. *Psychol. Med.* 45, 927–945. doi: 10.1017/s0033291714002141

Linardon, J., Cuijpers, P., Carlbring, P., Messer, M., and Fuller-Tyszkiewicz, M. (2019). The efficacy of app-supported smartphone interventions for mental health problems: a meta-analysis of randomized controlled trials. *World Psychiatry* 18, 325–336. doi: 10.1002/wps.20673

Linehan, M.M. (1993). *Skills Training Manual for Treating Borderline Personality Disorder*. New York: Guilford Press.

MacBeth, A., and Gumley, A. (2012). Exploring compassion: a meta-analysis of the association between self-compassion and psychopathology. *Clin. Psychol. Rev.* 32, 545–552. doi: 10.1016/j.cpr.2012.06.003

Mak, W. W., Tong, A. C., Yip, S. Y., Lui, W. W., Chio, F. H., Chan, A. T., et al. (2018). Efficacy and moderation of mobile app–based programs for mindfulness-based training, self- compassion training, and cognitive behavioral psychoeducation on mental health: randomized controlled noninferiority trial. *JMIR Mental Health* 5:e60. doi: 10.2196/mental.8597

Maslow, A. (1997). *Toward a Psychology of Being, 2nd Edn*. New York: Van Nostrand Reinhold.

McGuire, K. (2007). Complete focusing instructions. Available at: http://www.cefocusing.com/wordpress/?p=75

Mellor, D., Firth, L., and Moore, K. (2008). Can the internet improve the well-being of the elderly? *Ageing Int.* 32, 25–42. doi: 10.1007/s12126-008-9006-3

Neff, K. D. (2003). Self-compassion: an alternative conceptualization of a healthy attitude toward oneself. *Self Identity* 2, 85–101. doi: 10.1080/15298860309032

Neff, K. D., Kirkpatrick, K. L., and Rude, S. S. (2007). Self-compassion and adaptive psychological functioning. *J. Res. Pers.* 41, 139–154. doi: 10.1016/j.jrp.2006.03.004

Neff, K. D., and Vonk, R. (2009). Self-compassion versus global self-esteem: two different ways of relating to oneself. *J. Pers.* 77, 23–50. doi: 10.1111/j.1467-6494.2008.00537.x

O'Connor, R. C., and Noyce, R. (2008). Personality and cognitive processes: self-criticism and different types of rumination as predictors of suicidal ideation. *Behav. Res. Ther.* 46, 392–401. doi: 10.1016/j.brat.2008.01.007

Orosa-Duarte, Á., Mediavilla, R., Muñoz-Sanjose, A., Palao, Á., Garde, J., López-Herrero, V., et al. (2021). Mindfulness-based mobile app reduces anxiety and increases self-compassion in healthcare students: a randomised controlled trial. *Med. Teach.* 43, 686–693. doi: 10.1080/0142159x.2021.1887835

Pascual-Leone, A. (2017). How clients "change emotion with emotion": a programme of research on emotional processing. *Psychother. Res.* 28, 165–182. doi: 10.1080/10503307.2017.1349350

Pascual-Leone, A., and Greenberg, L. (2007). Emotional processing in experiential therapy: why "the only way out is through". *J. Consult. Clin. Psychol.* 75, 875–887. doi: 10.1037/0022-006X.75.6.875

Peneva, I., and Mavrodiev, S. (2013). A historical approach to assertiveness. *Psychol. Thought* 6, 3–26. doi: 10.5964/psyct.v6i1.14

Pennebaker, J. W. (2017). Expressive Writing in Psychological Science. Perspect. *Psychol. Sci.* 13, 226–229. doi: 10.1177/1745691617707315

Pennebaker, J. W., and Beall, S. K. (1986). Confronting a traumatic event: Toward an understanding of inhibition and disease. *J. Abnorm. Psychol.* 95, 274–281. doi: 10.1037/0021-843x.95.3.274

Sansó, N., Galiana, L., Cebolla, A., Oliver, A., Benito, E., and Ekman, E. (2017). Cultivating emotional balance in professional caregivers: a pilot intervention. *Mindfulness* 8, 1319–1327. doi: 10.1007/s12671-017-0707-0

Segal, J. (2008). *The Language of Emotional Intelligence: The Five Essential Tools for Building Powerful and Effective Relationships*. New York: McGraw-Hill.

Speed, B. C., Goldstein, B. L., and Goldfried, M. R. (2018). Assertiveness training: a forgotten evidence-based treatment. *Clin. Psychol. Sci. Pract.* 25, 1–20. doi: 10.1111/cpsp.12216

Statista. (2021). Forecast number of mobile users worldwide 2020–2025. Statista. Available at: https://www.statista.com/statistics/218984/number-of-global-mobile-users-since-2010/ (Accessed March 12, 2022).

Stein, S. J., and Book, H. E. (2006). *The EQ edge: emotional intelligence and your success, (2nd edition)*. Toronto, Canada: Multi-Health Systems.

Strauss, C., Taylor, B. L., Gu, J., Kuyken, W., Baer, R., Jones, F., et al. (2016). What is compassion and how can we measure it? A review of definitions and measures. *Clin. Psychol. Rev.* 47, 15–27. doi: 10.1016/j.cpr.2016.05.004

Timulak, L. (2015). Transforming Emotional Pain in Psychotherapy: An Emotion-Focused Approach. London, UK: Routledge, 183.

Torous, J., Lipschitz, J., Ng, M., and Firth, J. (2020). Dropout rates in clinical trials of smartphone apps for depressive symptoms: a systematic review and meta-analysis. *J. Affect. Disord.* 263, 413–419. doi: 10.1016/j.jad.2019.11.167

Vráblová, V., and Halamová, J. (2022). Short Version of the Scale for Interpersonal Behavior (s-SIB): Slovak Translation, Psychometric Analysis, and Factor Structure. *Front. Psychol.* 13:1024530. doi: 10.3389/fpsyg.2022.1024530

Vrana, G., and Greenberg, L. (2018). Overview of emotion-focused therapy. ed. M. Foroughe. *Emotion focused family therapy with children andcaregivers: A trauma-informed approach*. New York, NY: Routledge, 1–22.

Wahbeh, H., Svalina, M. N., and Oken, B. S. (2014). Group, one-on-one, or internet? Preferences for mindfulness meditation delivery format and their predictors. *Open Med. J.* 1, 66–74. doi: 10.2174/1874220301401010066

Zessin, U., Dickhauser, O., and Garbade, S. (2015). The relationship between self-compassion and well-being: a meta-analysis. *Appl. Psychol. Health Well Being* 7, 340–364. doi: 10.1111/aphw.12051

10.3389/fpsyg.2022.1047022

Appendix 1

The results of Shapiro-Wilks Normality tests and Cronbach's alpha for internal consistency.

	Shapiro-Wilkes Normality Test						Cronbach's α
Scales and dimensions	Pretest			Postest			
	Statistic	Df	Sig.	Statistic	Df	Sig.	
FSCRS IS	0.974	84	0.088	0.98	84	0.217	0.877
FSCRS RS	0.944	84	0.085	0.965	84	0.023	0.824
FSCRS HS	0.944	84	0.001	0.931	84	0	0.7
FSCRS IS+HS	0.973	84	0.08	0.978	84	0.166	0.885
SOCS-S	0.978	84	0.574	0.98	84	0.221	0.856
SOCS-S RS	0.933	84	0	0.899	84	0	0.814
SOCS-S US	0.815	84	0	0.77	84	0	0.768
SOCS-S FS	0.963	84	0.016	0.972	84	0.065	0.687
SOCS-S TS	0.981	84	0.266	0.979	84	0.199	0.759
SOCS-S MA	0.974	84	0.092	0.958	84	0.009	0.712
s-SIB	0.978	84	0.162	0.978	84	0.17	0.932
s-SIB NA	0.986	84	0.491	0.983	84	0.327	0.756
s-SIB PL	0.978	84	0.172	0.969	84	0.041	0.762
s-SIB IA	0.983	84	0.33	0.989	84	0.723	0.694
s-SIB PA	0.982	84	0.279	0.961	84	0.013	0.761
s-SIB F	0.987	84	0.59	0.98	84	0.231	0.907
s-SIB FNA	0.983	84	0.333	0.983	84	0.335	0.715
s-SIB FPL	0.988	84	0.649	0.987	84	0.561	0.753
s-SIB FIA	0.974	84	0.088	0.98	84	0.225	0.627
s-SIB FPA	0.981	84	0.266	0.982	84	0.299	0.676

frontiers | Frontiers in Psychology

TYPE Original Research
PUBLISHED 12 May 2023
DOI 10.3389/fpsyg.2023.1128680

OPEN ACCESS

EDITED BY
Pedro Rosário,
University of Minho, Portugal

REVIEWED BY
Risto Marttinen,
George Mason University, United States
Maura Pilotti,
Prince Mohammad Bin Fahd University, Saudi Arabia
Dongmei Meng,
East China Jiaotong University, China
Armanda Pereira,
University of Trás-os-Montes and Alto Douro, Portugal
Dayna Lee-Baggley,
Dalhousie University, Canada

*CORRESPONDENCE
Maureen R. Weiss
✉ mrweiss@umn.edu

†These authors have contributed equally to this work

RECEIVED 26 January 2023
ACCEPTED 13 April 2023
PUBLISHED 12 May 2023

CITATION
Weiss MR, Kipp LE and Riley A (2023) Inspiring IDEA: Girls on the Run's developmental approach to and assessment of inclusion, diversity, equity, and access programming. *Front. Psychol.* 14:1128680. doi: 10.3389/fpsyg.2023.1128680

Inspiring IDEA: Girls on the Run's developmental approach to and assessment of inclusion, diversity, equity, and access programming

Maureen R. Weiss[1*†], Lindsay E. Kipp[2†] and Allison Riley[3]

[1]School of Kinesiology, University of Minnesota, Minneapolis, MN, United States, [2]Department of Health and Human Performance, Texas State University, San Marcos, TX, United States, [3]Girls on the Run International, Charlotte, NC, United States

Introduction: Evaluation studies of positive youth development (PYD) programs show promising impact on children's psychosocial and behavioral outcomes, but less is known about how programming affects youth of varying racial, ethnic, and cultural identities. *Girls on the Run*, a physical activity-based PYD program, has developed curricula and coach training with a lens toward inclusion, diversity, equity, and access (IDEA). The purpose of this study was to assess the program's effectiveness in achieving IDEA programming goals.

Methods: Surveys were completed by youth (n = 342), caregivers (n = 2,375), and coaches (n = 1,406), and focus groups/interviews were conducted with 12 youth, 20 caregivers, and 9 coaches, diverse in race, ethnicity, ability, and other identities. Survey and focus group/interview questions addressed participants' thoughts and experiences regarding inclusion, diversity, equity, and access in *Girls on the Run*.

Results: Quantitative analyses of survey responses revealed favorable responses by all groups that the program: (a) provides a safe, inclusive, and supportive climate for all youth; (b) consists of teams with racially and ethnically diverse backgrounds; and, (c) successfully engages in strategies to reduce barriers to participation. Qualitative analyses of focus group/interview data resulted in 5 higher-order themes: (a) positive sentiments by girls, caregivers, and coaches; (b) social justice in the curriculum; (c) access to programming; (d) considerations regarding racial diversity; and, (e) serving gender-diverse participants.

Discussion: Collective findings characterized *Girls on the Run* as successful in meeting its pledge toward inclusion, diversity, equity, and access to participation. All groups recognized the program's positive impact on girls' social and emotional learning and fostering an atmosphere of community connectedness. Curricular lessons and coach training align with evidence based strategies for inclusive and equitable programming, which can serve as an exemplar for other out-of-school-time programs.

KEYWORDS

out-of-school-time, positive youth development, social-emotional learning, physical activity, mixed methods, diversity, equity, inclusion

Introduction

Afterschool programs provide meaningful contexts for enhancing youths' physical and psychosocial skills, health, and well-being (Mahoney et al., 2005; Smith, 2007; Pittman, 2017). In recent years, greater attention has been given to studying the characteristics, processes, and impact of out-of-school-time programs on PYD outcomes (Deutsch et al., 2017; Fredricks et al., 2017). Organized sports and physical activities connote a prevalent extracurricular pastime for

children and adolescents (Weiss et al., 2012), offering opportunity for positive developmental outcomes such as close friendships, supportive relationships with adults, self-confidence, and motor skills enabling lifelong activity (Stuntz and Weiss, 2010; Eime et al., 2013; Goodway and Robinson, 2015). Attaining these benefits requires social, contextual, and cultural supports to ensure accessible and equitable growth and development for *all* youth (Leman et al., 2017; Simpkins et al., 2017; Smith et al., 2017).

Physical activity-based PYD (PA-PYD) programs in school and out-of-school-time settings are especially suited to bring about desirable psychosocial and behavioral outcomes (Weiss and Wiese-Bjornstal, 2009; Hellison, 2011; Weiss, 2011; Ward and Parker, 2013). PYD is a framework that highlights the strengths of young people by teaching attributes and skills to empower them to succeed and thrive in their everyday lives (Larson, 2000; Damon, 2004; Ramey and Rose-Krasnor, 2011; Moore, 2017). PYD programs consist of structured activities for optimizing social, emotional, and behavioral competencies (Eccles and Gootman, 2002; Roth and Brooks-Gunn, 2003). Contextual features include opportunities for learning skills that generalize beyond the target activity; an environment emphasizing safe, trusting, and supportive relationships; clear and consistent expectations; emphasis on autonomy and expression; encouragement of prosocial values and norms; a climate of inclusivity and belonging; and engaging interactions among family, school, and community. The PYD framework guides Girls on the Run's curricula, coach training, and overall programming and, as such, formed the conceptual basis of the present study.

The PYD approach was framed by developmental psychologists with a focus on promoting academic, social, and emotional skills in school, home, and neighborhood contexts (Larson, 2000; Lerner et al., 2005; Benson, 2006). PYD was naturally appealing to sport science researchers and adapted for organized activities in school (e.g., physical education) and afterschool (e.g., sports) settings (Petitpas et al., 2005; Weiss and Wiese-Bjornstal, 2009; Hellison, 2011). While mainstream PYD and SEL researchers acknowledge sports and physical activities as *contexts* for youth development (Larson et al., 2006; Ramey and Rose-Krasnor, 2011; Jones et al., 2021), sport science researchers also identify *physical activity* level (frequency, intensity, duration), physical fitness, and fundamental motor skills as crucial behavioral competencies (Weiss and Wiese-Bjornstal, 2009; Weiss et al., 2012; Dzewaltowski and Rosenkranz, 2014). PA-PYD programs aim to improve both physical activity *and* social and emotional skills.

Enhancing physical activity alongside social and emotional learning is significant given the millions of youth in extracurricular pursuits but who still fall short of recommended activity levels (U.S. Department of Health and Human Services, 2018; Pfeiffer and Wierenga, 2019). Substantial evidence shows improved cognitive, psychosocial, and physical health for children and adolescents who engage in at least 60 min daily of moderate-to-vigorous physical activity (Donnelly et al., 2016; Hillman et al., 2017; U.S. Department of Health and Human Services, 2018). Only a small percentage of children and adolescents are meeting these guidelines (Designed to Move, 2012; Tremblay et al., 2016; U.S. Department of Health and Human Services, 2018), with percentages significantly lower for underserved and marginalized youth. Declining physical activity levels combined with increasing sedentary behaviors due to video gaming and social media (Banda and Robinson, 2017) reinforce the unique opportunity of PA-PYD programs to reverse this trend (Weiss et al., 2012; Dzewaltowski and Rosenkranz, 2014; Weiss, 2019).

The National Youth Sports Strategy (NYSS; U.S. Department of Health and Human Services, 2019) was implemented to motivate efforts by afterschool programs to meet physical activity guidelines, with special attention to underserved and marginalized populations—youth of color, youth of low-income families, youth living in rural communities, migrant youth, LGBTQ+ youth, and youth with disabilities. These populations have the most to gain from positive physical activity experiences but face many barriers to participation. NYSS highlighted *Girls on the Run* (GOTR) as an afterschool program dedicated to providing opportunities for *all* youth to improve physical activity and psychosocial outcomes. The current manuscript presents data of the program's sustained efforts to offer, and assess effectiveness in delivering, inclusive, diverse, equitable, and accessible programming to enable participation benefits for *all* youth.

As a PA-PYD program, GOTR[1] employs running, motor skills, and physical activities to develop 3rd to 8th grade girls' social, emotional, *and* physical competencies for leading a healthy lifestyle (Riley and Britt, 2017). The mission, "we inspire girls to be joyful, healthy, and confident using a fun, experience-based curriculum which creatively integrates running," is accompanied by a vision in which "every girl knows and activates her limitless potential and is free to boldly pursue her dreams." The 10-week, 20-lesson intentional curriculum includes 75–90 min that *integrate* physical activity and social-emotional learning of developmentally-appropriate concepts: Identity (self-care and self-awareness), Connectedness (selecting and sustaining healthy relationships), and Empowerment (appreciating differences and celebrating strengths). The curriculum is designed to create space for participants' experiences, cultures, and identities to shape the content of lessons, conversations, questions, and examples.

The curriculum aligns with Lerner's *Five Cs* framework—confidence, competence, connection, caring, and character (Lerner et al., 2005; Lerner and Lerner, 2006). Lerner stated that a sixth C, contribution, is attainable after the *Five Cs* are demonstrated, and GOTR explicitly includes lessons on implementing a community impact project. Thus, the program aims to help girls develop social, emotional, and physical *competence*, feel *confident* in who they are, create positive *connections* with peers and adults, develop moral *character*, respond to others and oneself with *care* and compassion, and make a meaningful *contribution* to community. GOTR annually serves about 200,000 girls in ~175 Councils spanning all 50 United States, District of Columbia, and Canada. Evaluation research shows evidence of positive and sustained impact on social and emotional skills *and* physical activity levels (e.g., Bean et al., 2012; Ullrich-French and Cole, 2018; Weiss et al., 2019, 2020, 2021).

Safe, trusting, and supportive relationships are a hallmark of effective PYD programs, and GOTR maximizes this aspect through their national coach training. This is a requirement for new *and* returning coaches where they are actively engaged in learning strategies to deliver the curriculum with fidelity. The heart of this training revolves around the acronym BPM: Building Relationships; Positive, Inclusive Environment; and, Mastery Climate—key contextual features of effective PYD programs

1 www.girlsontherun.org

(Eccles and Gootman, 2002). Coaches are also prepared to deliver culturally responsive and inclusive lessons. During training, coaches reflect on how their social and cultural backgrounds, and those of girls on their teams, might affect attitudes and behaviors toward themselves and others. A module also covers social identities, bias, debiasing, and guiding conversations on social justice with their teams.

GOTR was recognized by Jones et al. (2017, 2021) in their comprehensive reports highlighting school and out-of-school-time programs meeting rigorous criteria for demonstrating positive impact on social and emotional learning with elementary-age youth. The program was identified as making predominant use of physical activities (labeled kinesthetic activities) as an instructional strategy for developing SEL competencies. Programs were evaluated on domains of cognitive skills (e.g., attention control), social skills (e.g., cooperative behavior), emotion skills (e.g., self-regulation), values (e.g., prosocial norms), perspectives (e.g., gratitude), and identity (e.g., self-esteem). GOTR was rated strongest in promoting SEL skills in social, identity, and values domains; having extensive support for community engagement; and demonstrating a commitment to equitable and inclusive education.

Since 2014, inclusion, diversity, equity, and access (IDEA) has been at the forefront of GOTR's initiatives to elevate curricula, coach training, and programming. Readers are also directed to the inclusion and diversity link on the GOTR website. Jones et al. (2021) reported that GOTR strongly focuses on participation inclusivity, diversity, equity, and accessibility by integrating concepts into all aspects of program delivery. Examples include:

- providing scholarships to offset registration cost for low-income families;
- offering resources and materials in English and Spanish;
- partnering with the National Center on Health, Physical Activity and Disability (NCHPAD) to adapt lessons for girls with cognitive, sensory, and physical disabilities;
- training coaches on abuse prevention (in partnership with Darkness to Light), trauma-sensitive instruction, and disability inclusion;
- welcoming all girl-identifying youth as well as non-binary and gender-nonconforming youth; and
- framing lessons to counter gender stereotypes that negatively impact girls' self-esteem, motivation, and health.

Girls on the Run sustains a commitment to inspire IDEA for *all* girls varying in race, ethnicity, culture, socioeconomic status, ability, and gender identity. In 2021, they made a pledge to advance their commitment in programming, coach training, and evaluation practices:

> "We are committed to leveraging our intellectual, financial, and human resources to advance strategies to be inclusive, equitable and accessible to all. Our headquarters and councils are working to bring diverse voice to the table as we know that unique perspectives strengthen the quality and scope of our organization. We pledge to be a reflection of the communities we engage, not only in appearance, but also through fostering an atmosphere of community connectedness that serves as a model for our girls and community members."

The overarching goal is that "all participants have a meaningful and engaging experience," with objectives of updating programming and coach training; identifying strengths, opportunities, and areas for improvement; and, developing a sustainable system to advance IDEA priorities.

In recent years, PYD researchers place greater priority on conducting studies and evaluating program impact with diverse youth populations (Deutsch et al., 2017; Leman et al., 2017; Simpkins et al., 2017; Smith et al., 2017; Arellano et al., 2018). Simpkins and colleagues noted that Eccles and Gootman's (2002) features of effective PYD programs defined universal developmental needs but may not be sensitive to youth varying in racial, ethnic, and cultural diversity. Efforts to review programming based on IDEA are needed to ensure that sociocultural norms and identities of diverse youth are addressed in participation experiences. As Simpkins (2015) argued, "It is time to bring equity, inclusion, and diversity to the forefront of research on organized activities. Issues related to equity, inclusion, and diversity need to be considered in terms of who has access to activities, the predictors of participation, how to design meaningful and effective activities, and the outcomes associated with activities" (p. 123).

Given the need for greater inclusion of diverse populations in evaluation efforts and GOTR's pledge to elevate IDEA for girls, families, and coaches, the purpose of this study was to assess the program's effectiveness in achieving IDEA goals in curricular offerings and coach training. The Mid-Atlantic Equity Consortium, Inc. (MAEC)[2] was commissioned by GOTR to conduct an external review of initiatives to promote IDEA with multiple and diverse groups—youth participants, caregivers, and coaches. The ultimate goal of the evaluation was to build capacity for GOTR by identifying strengths and opportunities for sustaining IDEA in quality programming, coach training, and assessing impact. We conducted a secondary data analysis of the survey and focus group/interview data collected by MAEC; discuss how findings align with GOTR's goals for sustaining an IDEA lens; and propose how study findings and related research can assist afterschool programs with strategies for prioritizing IDEA in programming consistent with PYD and SEL approaches. Based on studies evaluating the effectiveness of Girls on the Run in promoting socioemotional development (e.g., Ullrich-French and Cole, 2018; Weiss et al., 2020, 2021; Jones et al., 2021), and the program's sustained commitment to a culturally responsive curriculum for *all* participants, we hypothesized that respondents of diverse identities will favorably appraise their experiences in the program as inclusive, equitable, and accessible.

Method

GOTR's IDEA initiative defined

The overarching goal that "*all* participants have a meaningful and engaging experience" refers to people of all intersecting social identities—race, ethnicity, gender, ability, income level, religion, and

2 MAEC was founded in 1992 as an education non-profit dedicated to increasing access to high-quality education for culturally, linguistically, and economically diverse learners.

TABLE 1 Sample survey questions for youth, caregivers, and coaches.

Youth	Caregivers	Coaches
I have friends or teammates that I get along with at GOTR	My child has friends or teammates they get along with at GOTR	All participants on my team have friends or teammates they get along with at GOTR
I feel included in all activities at GOTR that I want to participate in	My child feels included and welcomed in all activities at GOTR that they want to participate in	All participants on my team feel included and welcomed in all activities they want to participate in
My GOTR coaches are about me	GOTR coaches care about my child and who they are as a person	All coaches on my team care about each participant and who they are as a person
I use what I learn during GOTR in my life (at home, in school, another sport, afterschool activity)	I feel that the content/topics my child learns about at GOTR are important for my child to learn	The GOTR lessons are relevant to all the participants on my team
My coaches listen to me when I talk with them	My child's coaches communicate with me on a regular basis about what my child is learning in GOTR	The coaches on my team listen to participants when participants talk to them
My coaches take time to help or talk with me when I need it	My child's coaches know how to relate to me when I talk with them	I know how to relate to participants on my team when I talk with them

Questions were rated on a 4-point Likert scale ranging from strongly disagree to strongly agree.

others—are afforded opportunities to develop and improve social–emotional skills, cognitive abilities, and physical activity behaviors. To this point, each of the IDEA criteria are operationally defined and presented on the GOTR website:

- Inclusive: Girls on the Run is a place of belonging and welcomes, engages, and values all people.
- Diverse: The Girls on the Run movement mirrors the communities it serves. People of all races, ethnicities, thinking styles, abilities, generations, social roles, income levels, sexual orientation, gender identity, educational levels, and religions are represented and serve as active members of the organization.
- Equitable: Girls on the Run is a place where systemic disparities are acknowledged and addressed. Policies and practices ensure everyone can activate their limitless potential.
- Accessible: Everyone can fully participate in Girls on the Run programming, retrieve and utilize resources, and contribute through volunteer and employment opportunities.

Advisory group

Prior to collecting data, a 23-member advisory group was convened to provide input about the content and relevance of survey and focus group/interview questions. Members included GOTR headquarters staff, Council staff, site liaisons, caregivers, former youth participants, and programming experts (e.g., youth development academics, NCHPAD coordinator). An initial meeting entailed GOTR and MAEC personnel introducing the project purposes and tasks requested on behalf of the advisory group. Follow-up communications involved feedback on survey and focus group/interview questions and initial findings.

Survey measure

Composition

Surveys were developed in collaboration by MAEC evaluation team members and GOTR leadership staff to be administered via Qualtrics. Questions were intentionally designed to focus on participants' thoughts and experiences regarding inclusion, diversity, equity, and access in Girls on the Run. Questions were tailored to youth participants, caregivers, and coaches, and available in English and Spanish. Many questions were asked in parallel format (e.g., "I feel safe at Girls on the Run"; "My child feels safe (socially, emotionally, and physically) at Girls on the Run," "All participants on my team feel safe (socially, emotionally, and physically) at Girls on the Run").[3] Most questions included a 4-point Likert scale ranging from strongly disagree to strongly agree, with an option of "I do not know" (not included in analyses). Some items allowed for optional follow-up open-ended responses. Sample questions are seen in Table 1.

Participant numbers and demographics

Responses represented 76 Councils (of nearly 175), including youth participants ($n = 342$), caregivers ($n = 2{,}375$), and coaches ($n = 1{,}406$).[4] Table 2 shows percentages by race/ethnicity for all groups. Less than 1% of youth were identified as nonbinary or transgender by their caregivers. A majority of the girls (64.7%) were in their first season in the program, with the remaining 35.3% indicating 2–6 seasons. For each season, time and intensity of exposure translates to 10 weeks, 2 sessions weekly, and 75–90 min per session, for a total of 20 lessons, 25–30 h, and a season-ending 5 K event.

Caregivers indicated being their child's biological or birth parent (95%), with others a relative, legal guardian, or foster or adoptive parent. Coaches averaged 3 seasons' experience in GOTR ($M = 3.3$, $SD = 2.9$), with 39% in their first season. Most coaches identified as female (97.4%); others identified as male (1.3%), nonbinary (0.08%), transgender (0.08%), or chose "prefer to self-describe" (0.16%) or "prefer not to say" (1.0%).

3 Caregivers were asked to collaborate with and help their daughter do the survey. Caregivers who were also coaches completed the survey twice, once for each perspective.

4 ≥90% of the respondents identified Girls on the Run (grades 3–5) as their program experience; others named Heart & Sole (grades 6–8) and Camp GOTR (shortened summer program).

TABLE 2 Race breakdown (%) for survey participants by group (*N*=3,695).

Race	Youth (*n*=286)	Caregivers (*n*=2,132)	Coaches (*n*=1,277)
American Indian/Alaskan Native	0	0	0.2
Asian	2.4	3.9	2.8
Black/African American	6.6	6.8	4.3
Hispanic/ Latinx	6.3	6.1	3.8
Multiracial	10.5	8.4	3.5
Native Hawaiian/ Pacific Islander	0	0	0.2
White/ Caucasian	63.6	70.9	81.4
Other	2.8	0.1	0.7
Prefer Not to Say	7.7	3.8	3.1

Participants were coded as Multiracial if they selected more than one category (e.g., White and Native Hawaiian/Pacific Islander; Asian and American Indian/Alaskan Native).

TABLE 3 Race breakdown for focus group/interview participants (*N*=41).

Race	Youth (*n*=12)	Caregivers (*n*=20)	Coaches (*n*=9)
Asian	2	0	0
Black/African American	5	8	0
Hispanic/ Latinx	2	8	1
Native American	0	0	1
White/ Caucasian	2	4	6
Other	0	0	1

Race was left blank for one youth participant.

Focus groups and interviews

Participants

A total of 41 individuals participated in 6 focus groups and 9 interviews, including 12 girls, 20 caregivers, and 9 coaches. There were 2 youth focus groups with 6 participants each, 2 caregiver focus groups with 5 and 6 individuals, and 2 coach focus groups with 3 and 4 individuals. Two coaches and 5 caregivers gave individual interviews, whereas 4 unrelated caregivers participated in paired interviews. Table 3 displays the racial breakdown by group.[5]

5 For focus groups and interviews, the caregiver's race served as a proxy for their child's race because the volunteer sign-up at the end of the survey only asked for the family member's and not their child's race.

Protocols

After drafting focus group and interview questions, MAEC sought input from the advisory group on wording, relevance, and cultural and linguistic sensitivity. All focus groups and interviews were conducted virtually by a facilitator and an assistant notetaker, including MAEC evaluation team or staff members. At least one person from the MAEC evaluation team was present at each focus group. All members of the MAEC evaluation team had at least a Master's degree with graduate level coursework in qualitative methods. All had led focus groups for projects with other organizations prior to this external review. Interviewers and advisory group, evaluation team, and staff members represented diverse groups based on race, ethnicity, culture, nationality, gender, and education level.

For youth participants, the interviewer introduced herself and the session purpose to learn about their experiences in GOTR. Girls were apprised that responses would be confidential and they did not have to respond to questions that made them feel uncomfortable. The protocol was adapted from focus group guidelines with children (Terre des hommes, 2019). Sessions with caregivers and coaches also began with an introduction and purpose of learning about their child's or team members' experiences in GOTR, with a focus on whether and how the program is an inclusive, accepting, and equitable space for all youth participants.

For youth, questions centered on three issues: equity (referred to as fairness); being included, welcomed, and instilled with a sense of belonging; and, the curriculum. For caregivers, issues focused on equity; their child's experiences; their own experiences and perceptions of the program; the curriculum; social justice; and, other considerations (e.g., inclusion of non-binary youth, diversity of friendships). For coaches, issues of equity, team members' experiences, and the curriculum were also at the forefront, in addition to questions regarding coach training and parent/family engagement. Questions were followed with clarification and elaboration probes. Table 4 displays an abbreviated version of focus group/interview questions for all three groups.

Procedure/recruitment

GOTR's Chief Program Officer contacted Council Directors about the study purpose and required tasks. Initially 87 Councils indicated interest, and additional information was provided about the survey, timeline, and recruitment strategies. This included an email restating the purpose ("gather the thoughts and experiences of GOTR participants, parents/guardians, and coaches related to inclusion, diversity, equity and access [IDEA] at GOTR"), templates for distributing to caregivers and coaches, and an online link and QR code to access the survey. Study participants were informed that responses were confidential and upon completion they would be eligible to win a gift card. At survey's end, respondents were prompted about volunteering for a focus group or interview with an added gift card incentive. Volunteers provided demographic information, which experiences they could speak to (e.g., GOTR participants who are Black/African American; GOTR participants who identify as LGBTQIA+), and whether they permit their child to participate in a focus group or interview regarding their experiences. From this information, focus group and interview participants were identified using purposive sampling, and various affinity groups were formed to ensure diversity in race, ethnicity, language spoken at home, and types of GOTR experiences they could speak to. Surveys, focus groups, and interviews were conducted virtually.

TABLE 4 Abbreviated focus group/interview questions for all three groups.

Youth	Caregivers	Coaches
What does fairness look like and feel like in Girls on the Run?	What does equity look like and feel like in Girls on the Run?	What does equity look like and feel like in Girls on the Run?
Do you feel included and welcomed in the Girls on the Run activities that you want to participate in?	Does your child feel included and welcomed in all activities at Girls on the Run that they want to participate in?	As a coach, what have you done to ensure participants on your team feel included and welcomed in all activities at Girls on the Run that they want to participate in?
During Girls on the Run lessons, do you get to share stories or experiences about your own life?	From your perspective, how does Girls on the Run ensure that participants from diverse backgrounds feel that they belong?	How do you, as a coach, ensure participants from diverse backgrounds feel that they belong?
Do you feel that your coach(es) care about you and listen to you?	Do you believe coaches have positive relationships with participants, including participants from different socioeconomic backgrounds, religions, races, etc. Why or why not?	Have you experienced any challenges in developing connections with participants from diverse backgrounds, including participants from different socioeconomic backgrounds, religions, races, etc.? If so, can you elaborate?
Have you used anything you have learned during Girls on the Run in your life? (at home, in school, in another sport or afterschool activity? If so, how?)	From your perspective, what are critical issues related to equity that Girls on the Run should focus on in the lessons taught?	From your perspective, what are critical issues related to equity that Girls on the Run should focus on?

The full set of interview questions is available from the first author.

Data analyses

Quantitative analyses

We calculated means (*M*) and standard deviations (*SD*) for all survey items for girls, caregivers, and coaches. Independent *t*-tests were conducted to determine whether responses differed by race/ethnicity, comparing those who identified as White-only to those of any other racial or ethnic category, labeled as Black, Indigenous, People of Color (BIPOC).[6] We applied a Bonferroni adjustment to protect against Type 1 errors (Tabachnick and Fidell, 2019). Statistical significance was set at $p < 0.0031$ for girls (0.05/16 items), $p < 0.0026$ for caregivers (0.05/19 items), and $p < 0.0016$ for coaches (0.05/32 items). Effect size (ES) was calculated using Cohen's *d* (1988): $d \geq 0.20$ = small, ≥ 0.50 = medium, ≥ 0.80 = large.

Qualitative analyses

Open-ended survey responses were coded to create a list of key topics and number of examples cited by respondents. Focus groups and interviews were recorded and transcribed verbatim. Facilitators and notetakers met to identify emergent themes within and across all group and individual sessions. Then, three members of the MAEC evaluation team read and deidentified the transcripts, assigning speaker codes and removing comments that could reveal identity. During this process, MAEC team members selected quotes that aligned with emergent themes identified in the group meeting and noted any additional themes. Then, one member of the MAEC team coded the deidentified transcripts in MAXQDA, a software program designed for computer-assisted qualitative and mixed methods data analysis, checking the document to ensure quotes aligned with themes and coding additional transcript segments. This team member then generated theme summaries, which were checked by facilitators, notetakers, and the MAEC evaluation team to ensure they accurately captured participants' perspectives and experiences.

Results

Quantitative analyses: youth participants

Several survey items centered on feelings of inclusion in GOTR (e.g., "I am given the chance to talk about my own examples and things from my life …"; "I feel included in all activities … that I want to participate in"; "I can be myself at Girls on the Run"). A few items focused on positive developmental outcomes (e.g., "I have friends or teammates that I get along with at Girls on the Run"). For almost all items (14 of 16), responses tended toward "strongly agree" (>3.5), indicating high approval with their experiences of feeling safe, included, and treated equitably (Table 5). Ratings were also high for relevance of lesson content (e.g., "I use what I learn during Girls on the Run in my life [at home, in school, in another sport or afterschool activity]"). Five items related to perceptions about coaches, all receiving "strongly agree" ratings (e.g., "My coach cares about me"; "I feel comfortable talking to my coach"; "My coach takes time to help or talk with me when I need it"). No differences emerged for White and BIPOC participants on 15 of 16 items, the only exception ($p > 0.0031$; $d = 0.31$), "At Girls on the Run, everyone knows how to say my name or does their best to say my name the right way," with White participants reporting stronger agreement ($M = 3.73$) than BIPOC participants ($M = 3.55$). However, both means indicate strong agreement and the effect size indicated small practical significance.

6 Sample sizes for racial groups within BIPOC (e.g., Hispanic, Asian, Native Hawaiian/Pacific Islander) were relatively small and disproportionate compared to White, so we used the BIPOC category in our analyses for more stable estimates.

10.3389/fpsyg.2023.1128680

TABLE 5 Girls: means and standard deviations for all girls and for White and BIPOC groups, with effect size comparing race/ethnicity.

Item on girl survey	*M* (*SD*)			Cohen's *d*
	All	White	BIPOC	
I enjoy Girls on the Run.	3.60 (0.58)	3.62 (0.51)	3.63 (0.58)	0.02
I am proud to be a part of Girls on the Run.	3.68 (0.52)	3.69 (0.48)	3.71 (0.51)	0.04
I have friends or teammates that I get along with at Girls on the Run.	3.69 (0.52)	3.70 (0.51)	3.70 (0.51)	0
I can be myself at Girls on the Run.	3.64 (0.56)	3.64 (0.53)	3.61 (0.62)	0.05
All of my teammates can be themselves at Girls on the Run.	3.66 (0.51)	3.66 (0.49)	3.63 (0.53)	0.06
At Girls on the Run, everyone knows how to say my name or does their best to say my name the right way.	3.67 (0.55)	3.73 (0.52)	3.55 (0.65)	0.31
I feel safe at Girls on the Run.	3.79 (0.42)	3.82 (0.39)	3.79 (0.46)	0.07
I feel included in all activities at Girls on the Run that I want to participate in.	3.70 (0.53)	3.73 (0.48)	3.73 (0.54)	0
I learn things at Girls on the Run that are interesting to me.	3.41 (0.64)	3.40 (0.60)	3.46 (0.59)	0.10
I use what I learn during Girls on the Run in my life (for example, at home, in school, in another sport or afterschool activity).	3.29 (0.66)	3.23 (0.62)	3.35 (0.67)	0.18
I am given the chance to talk about my own examples and things from my life at Girls on the Run.	3.54 (0.62)	3.58 (0.55)	3.54 (0.63)	0.07
My coaches provide me with choices and options.	3.66 (0.54)	3.66 (0.52)	3.74 (0.47)	0.16
My Girls on the Run coaches care about me.	3.79 (0.42)	3.78 (0.42)	3.83 (0.38)	0.13
My coaches take time to help or talk with me when I need it.	3.69 (0.51)	3.72 (0.46)	3.67 (0.52)	0.10
I feel comfortable talking to my coach(es).	3.63 (0.55)	3.66 (0.53)	3.59 (0.57)	0.13
My coach(es) listens to me when I talk with them.	3.74 (0.48)	3.77 (0.42)	3.75 (0.49)	0.04

N for the full girl sample was 342. Of these, 78 did not report race/ethnicity (either left blank or chose "prefer not to say"). Sample size for White was 181 and for BIPOC was 83.

Quantitative analyses: caregivers

Responses reflected strong approval on items closely related to their child's participation experiences reflecting inclusion and accessibility (e.g., "My child feels included and welcomed in all activities … they want to participate in"; "My child feels safe [socially, emotionally, and physically] at Girls on the Run"). They also felt strongly that lesson content was relevant and useful for their child. Caregivers affirmed that coaches cared about who their child was as a person. For those who reported their child required accommodations to participate, 100% agreed or strongly agreed that GOTR provided the accommodations needed ($M = 3.72$) and that their child was able to participate equitably to her peers ($M = 3.76$).

Caregivers strongly agreed GOTR is inclusive, accessible, and equitable for *themselves* (e.g., "My child's coaches know how to relate to me when I talk with them"; "The coaches/staff at Girls on the Run verbally communicate with me in a way I can understand"). Scores for 2 items were just below 3.5: "My child's coaches communicate with me on a regular basis about what my child is learning in Girls on the Run," and "I am familiar with the Girls on the Run lesson content and its program goals." These items had larger *SD's* than other items, indicating greater variability in how familiar caregivers are with lessons.

Scores for 2 items were closer to 3.0: "It is important to me that the content presented during Girls on the Run lessons includes social justice topics," and "The diversity of my child's teammates is representative of the diversity in my community." Again, the higher *SD's* for these items indicate more varied perceptions. White and BIPOC caregivers differed ($p < 0.0026$) on these two items (Table 6); BIPOC agreed more strongly with both statements. Scores for both groups, however, were between "agree" and "strongly agree," with effect sizes small for importance of including social justice topics ($d = 0.44$) and imperceptible for diversity of child's teammates ($d = 0.18$). Perceived importance of teaching about social justice and whether their child's team was representatively diverse were clarified in focus group/interview responses.

Quantitative analyses: coaches

Coaches favorably appraised the program's accessibility, diversity, and inclusion and their role in reinforcing these ideals (Table 7). Coaches strongly believe they create a supportive and respectful environment, such as being familiar with team members' cultural identities (e.g., race/ethnicity, languages spoken), knowing how to pronounce each participant's name, and valuing individuals' culture, identity, and who they are as a person. Similar to youth and caregivers, coaches highly rated GOTR experiences as safe, welcoming, and accommodating regardless of ability. They also strongly agreed that GOTR lessons were relevant and useful, and that examples and scenarios represented their team's diversity.

10.3389/fpsyg.2023.1128680

TABLE 6 Caregivers: means and standard deviations for all caregivers and for White and BIPOC groups, with effect size comparing race/ethnicity.

Item on caregiver survey	*M* (*SD*)			Cohen's *d*
	All	White	BIPOC	
My child enjoys Girls on the Run.	3.73 (0.50)	3.73 (0.48)	3.79 (0.48)	0.13
My child is proud to be a part of Girls on the Run.	3.77 (0.47)	3.77 (0.44)	3.82 (0.44)	0.11
My child has friends or teammates they get along with at Girls on the Run.	3.74 (0.49)	3.76 (0.45)	3.73 (0.52)	0.06
My child can be their full self at Girls on the Run.	3.71 (0.51)	3.72 (0.49)	3.73 (0.51)	0.02
At Girls on the Run, everyone knows how to pronounce my child's name or makes an effort to pronounce it correctly.	3.84 (0.39)	3.86 (0.36)	3.82 (0.43)	0.10
My child feels safe (socially, emotionally, and physically) at Girls on the Run.	3.81 (0.42)	3.82 (0.40)	3.82 (0.42)	0
My child feels included and welcomed in all activities at Girls on the Run that they want to participate in.	3.79 (0.44)	3.80 (0.43)	3.81 (0.43)	0.02
Girls on the Run coaches care about my child and who they are as a person.	3.82 (0.42)	3.83 (0.39)	3.83 (0.42)	0
My child's coaches communicate with me on a regular basis about what my child is learning in Girls on the Run.	3.47 (0.76)	3.49 (0.74)	3.49 (0.76)	0
I am familiar with the Girls on the Run lesson content and its program goals.	3.38 (0.66)	3.37 (0.65)	3.46 (0.66)	0.14
I feel that what my child is learning at Girls on the Run is relevant to them and their life.	3.71 (0.48)	3.74 (0.45)	3.74 (0.46)	0
I feel that the content/topics my child learns about at Girls on the Run are important for my child to learn.	3.76 (0.44)	3.78 (0.42)	3.78 (0.43)	0
It is important to me that the content presented during Girls on the Run lessons includes social justice topics.	3.17 (0.86)	3.12 (0.85)	*3.46 (0.71)	0.44
The diversity of my child's teammates is representative of the diversity in my community.	3.27 (0.71)	3.23 (0.70)	*3.36 (0.73)	0.18
My child's coach(es) knows how to relate to me when I talk with them.	3.64 (0.54)	3.66 (0.52)	3.63 (0.55)	0.06
The coaches/staff at Girls on the Run verbally communicate with me in a way I can understand.	3.70 (0.50)	3.73 (0.48)	3.66 (0.55)	0.14
Girls on the Run's written materials (e.g., flyers, emails, etc.) are provided in a language I can understand.	3.77 (0.44)	3.79 (0.42)	3.74 (0.47)	0.11
Girls on the Run provided the accommodations my child needed.	3.72 (0.45)	3.70 (0.47)	3.73 (0.46)	0.06
My child participated equally to her peers.	3.76 (0.43)	3.70 (0.47)	3.82 (0.40)	0.28

N for the full caregiver sample was 2,375. Of these, 306 did not report race/ethnicity (either left blank or chose "prefer not to say"). Sample size for White was 1,490 and for BIPOC was 579. For the last two items, only those who answered "Yes" to the question, "Does your child require any accommodations in order to fully participate in Girls on the Run?" responded ($n = 50$; 27 White, 22 BIPOC, 1 did not report race/ethnicity).
*Indicates significantly different from White ($p < 0.0026$).

Several questions prompted whether coaches felt knowledgeable and prepared to serve girls from diverse backgrounds. Scores ranged from 3.37 to 3.55 for feeling equipped with the knowledge and skills to serve various groups, with greater confidence reported for working with individuals diverse in race/ethnicity, socioeconomic status, and disability than for those of English Learner status and gender identity. Most coaches agreed their GOTR training prepared them to work with girls and families of diverse backgrounds and that their council provides resources to address barriers families may face when accessing GOTR.

Statistically significant differences emerged between White and BIPOC coaches for 6 items ($p < 0.0016$). First, BIPOC coaches felt stronger about the importance of including social justice topics in GOTR lessons. Second, BIPOC coaches felt better equipped to work with diverse participants based on 5 of 7 demographic groups: race/ethnicity, socioeconomic status, national origin, English Learner status, and gender identity. However, scores for both groups fell

TABLE 7 Coaches: means and standard deviations for all coaches and for White and BIPOC groups, with effect size comparing race/ethnicity.

Item on coach survey	*M* (*SD*)			Cohen's *d*
	All	White	BIPOC	
All participants on my team enjoy Girls on the Run.	3.50 (0.58)	3.49 (0.57)	3.56 (0.59)	0.12
The participants on my team feel proud to be a part of Girls on the Run.	3.64 (0.50)	3.63 (0.50)	3.69 (0.48)	0.12
All participants on my team have friends or teammates they get along with at Girls on the Run.	3.61 (0.54)	3.62 (0.52)	3.60 (0.59)	0.04
All participants on my team feel they can be their full selves at Girls on the Run.	3.56 (0.55)	3.56 (0.54)	3.63 (0.55)	0.13
I am familiar with the cultural identities (e.g., race/ethnicity, languages spoken, religious affiliation, etc.) of each participant on my team.	3.43 (0.66)	3.43 (0.67)	3.51 (0.62)	0.12
I know how to pronounce the name of each participant on my team.	3.84 (0.39)	3.86 (0.37)	3.82 (0.40)	0.10
Each participant's culture, identities, and who they are as a person are valued at Girls on the Run.	3.83 (0.39)	3.85 (0.37)	3.83 (0.41)	0.05
All participants on my team feel safe (socially, emotionally, and physically) at Girls on the Run.	3.76 (0.44)	3.76 (0.44)	3.82 (0.40)	0.14
All participants on my team can participate in all activities that they want to participate in, regardless of ability or disability.	3.81 (0.43)	3.83 (0.40)	3.82 (0.44)	0.02
All participants on my team feel included and welcomed in all activities that they want to participate in.	3.77 (0.44)	3.78 (0.43)	3.79 (0.45)	0.02
All coaches on my team care about each participant and who they are as a person.	3.87 (0.36)	3.89 (0.35)	3.85 (0.37)	0.11
The Girls on the Run lessons are relevant to all the participants on my team.	3.68 (0.53)	3.69 (0.51)	3.74 (0.51)	0.10
The examples and scenarios in the Girls on the Run lessons are representative of the diversity of participants on my team.	3.54 (0.59)	3.54 (0.58)	3.55 (0.61)	0.02
The skills and strategies participants learn through the Girls on the Run lessons are useful to them in their lives.	3.76 (0.44)	3.78 (0.42)	3.78 (0.44)	0
Each participant on my team is given the chance to talk about their own examples and experiences during the Girls on the Run practices.	3.82 (0.41)	3.83 (0.39)	3.81 (0.41)	0.05
It is important to me that the content presented during Girls on the Run lessons includes social justice topics.	3.33 (0.77)	3.31 (0.77)	*3.58 (0.66)	0.38
The diversity of the participants on my team is representative of the diversity of the Girls on the Run site (e.g., school, community center, etc.).	3.38 (0.68)	3.37 (0.68)	3.46 (0.69)	0.13
I provide choices and options to the participants on my team.	3.62 (0.50)	3.63 (0.50)	3.61 (0.51)	0.04
The coaches on my team listen to participants when participants talk to them.	3.83 (0.39)	3.85 (0.37)	3.82 (0.42)	0.08
I know how to relate to the participants on my team when I talk with them.	3.68 (0.48)	3.67 (0.48)	3.72 (0.48)	0.10
I feel equipped with the knowledge and skills to serve participants from diverse backgrounds including:				
Race/ethnicity	3.52 (0.54)	3.49 (0.54)	*3.73 (0.47)	0.48
Socioeconomic status	3.55 (0.53)	3.53 (0.53)	*3.67 (0.49)	0.27
National origin	3.47 (0.56)	3.44 (0.55)	*3.65 (0.52)	0.39
English Learner status	3.38 (0.64)	3.32 (0.65)	*3.65 (0.54)	0.56
Gender identity/expression	3.37 (0.67)	3.35 (0.67)	*3.52 (0.61)	0.27
Religious affiliation	3.46 (0.56)	3.45 (0.55)	3.54 (0.55)	0.16
Disability status	3.49 (0.58)	3.47 (0.59)	3.59 (0.57)	0.21
My coach training prepared me to work with participants from diverse backgrounds.	3.30 (0.59)	3.31 (0.56)	3.36 (0.65)	0.08
Participants on my team have experienced barriers in accessing Girls on the Run (e.g., transportation challenges, physical accessibility, financial or language barriers, etc.)	2.16 (0.82)	2.15 (0.79)	2.20 (0.95)	0.06
I feel my local council provides the support and resources needed to address barriers participants/families may face in accessing Girls on the Run.	3.41 (0.57)	3.41 (0.56)	3.46 (0.54)	0.09

(Continued)

TABLE 7 (Continued)

Item on coach survey	*M* (*SD*)			Cohen's *d*
	All	White	BIPOC	
The coaches/staff at Girls on the Run communicate with parents/guardians in a way they can understand.	3.70 (0.47)	3.70 (0.48)	3.75 (0.45)	0.11
My council provides non-English translations of written materials (e.g., flyers, emails, etc.) to parents/guardians/family members who need it.**	3.40 (0.68)	3.39 (0.68)	3.50 (0.63)	0.17

N for the full coach sample was 1,406. Of these, 178 did not report race/ethnicity (either left blank or chose "prefer not to say"). Sample size for White was 1,030 and for BIPOC was 198.
*Indicates significantly different from White ($p < 0.0016$).
**About half of the coaches responded to the last item ($n = 702$), and the remainder either chose "I do not know" or left it blank; thus, the mean should be interpreted with this in mind.

between "agree" and "strongly agree," and effect sizes were mostly small (d's = 0.27–0.48), with a medium effect size ($d = 0.56$) for English Learner status. No differences emerged for working with girls of varying religious affiliation and disability status.

Qualitative analyses: open-ended survey questions

Two findings from open-ended responses were: (a) a majority of caregivers and coaches believe it is important to include social justice topics in lessons, and (b) a relatively small number of caregivers and coaches reported that girls experienced barriers in accessing GOTR. Caregivers (80.4%) and coaches (86.1%) agreed or strongly agreed with, "It is important to me that the content presented during Girls on the Run lessons includes social justice topics," and were asked to describe topics that should be included (with examples of affirming diversity of all people, understanding bias, standing up against prejudice). Most follow-up responses included the 3 examples, along with several other topics (Table 8). One coach wrote, "I think that all topics of social justice should be taught or touched on. There was little diversity on the team, so teaching them to understand and confront bias and prejudice is important."

Only 3.6% of caregivers responded "yes" to, "My child has experienced barriers in accessing Girls on the Run (e.g., transportation challenges, physical accessibility, financial or language barriers)." Most followed by describing transportation, cost, and language barriers. One caregiver wrote, "… with the program ending at 4:50 it was a challenge to leave work. We relied on a lot of family help and having to leave work." Location changes due to COVID-19 contributed to transportation issues because sessions were moved off-site due to no school programming. Some caregivers named cost as a barrier while others mentioned that cost was initially a barrier but they were able to receive aid: "We received financial support to participate. That was hugely helpful and much appreciated!"

For coaches, 27.4% agreed or strongly agreed that the girls on their team experienced barriers. When asked to describe, a majority listed similar barriers as caregivers, including transportation and cost. Coaches also reported location and scheduled times of GOTR as barriers and mentioned that some families started carpooling to address transportation challenges. Language translation was also cited as a barrier. One coach wrote, "Three of the seven girls [on my team] spoke Spanish at home. None of the coaches spoke Spanish. One email was translated by a GOTR director before the season started but there was no support after that."

Qualitative analyses: focus groups and interviews

Focus group/interview analyses within and across groups resulted in 5 higher-order themes: (a) positive sentiments by girls, caregivers, and coaches; (b) social justice in the curriculum; (c) access to GOTR programming; (d) considerations regarding racial diversity; and, (e) serving gender-diverse participants. Each theme is described, along with lower-order themes and example quotations. A visual of the higher-and lower-order themes is depicted in Table 9.

Theme 1: positive sentiments by girls, caregivers, and coaches (36 quotations)

Youth participants, caregivers, and coaches discussed many positive aspects of the program revolving around IDEA. Girls and caregivers believed coaches created a welcoming space. Girls discussed feeling supported, learning about interesting topics, and using strategies like Star Power in social contexts and situations outside GOTR (i.e., girls are taught to focus on their unique strengths to activate their power to shine). Coaches believe the curriculum fosters inclusivity, and caregivers talked about how their child's unique experience as a GOTR participant has created opportunities for friendships outside the program.

The first lower-order theme is *Inviting, Supportive Space.* Caregivers and girls commented that coaches created a warm and friendly environment, provided individual attention, and encouraged girls to participate in a way most comfortable for them. A caregiver in the Latinx Affinity Group said (in Spanish), "In the group my daughter was the only Hispanic girl … considering [she] had just arrived in the United States and did not speak any English when she entered the program, she always felt very included. The coaches … made her feel welcome, happy … they did a great job in welcoming her and making her feel like she belong[ed]." One girl described, "So, we were doing the 5 K … there was this person on crutches, and she was so determined to finish … she did the whole 5 K with crutches on. The coaches … let her do it and they didn't say that she was doing anything wrong. So, I felt that that was very equal … it was kind." Other girls gave examples of encouragement: "They [coaches] give us like positive messages. Like if somebody said 'I can't do it', they would say 'you can do it'"; "At practices, my friends kept cheering me on to finish a lap."

The second lower order theme is *Inclusive Curriculum.* Coaches emphasized that the curriculum is relevant and applicable to participants of all backgrounds. The focus on self-and other-acceptance fosters an inclusive environment. One coach expressed: "The curriculum really is inclusive in so many ways, beyond just

TABLE 8 Percentage of caregivers and coaches who cited various social justice topics to be included in GOTR lessons, based on open-ended survey responses.

Topic	Caregiver % (*n*=1,098)	Coach % (*n*=793)
Understanding and affirming diversity	35.9%	37.2%
Understanding bias or implicit bias	20.1%	31.9%
Understanding and standing up against prejudice	26.2%	33.2%
Inclusion (including diversity and inclusion, being inclusive, etc.)	10.5%	5.7%
Understanding racism, being anti-racist, racial justice, race equity	8.3%	11.9%
Women's rights/equality, gender equality, gender equity, gender stereotypes, understanding sexism, female empowerment	6.4%	3.2%
Standing up against bullying	4.5%	5.0%
LGBTQ+ needs/rights; gender identity and diversity	3.2%	3.9%
Ability, Disability needs/rights, special needs	1.7%	1.9%
Economic inclusion, diversity, justice; food insecurity	1.4%	1.7%

TABLE 9 Higher and lower-order themes from focus groups and interviews.

Higher-order theme	Lower-order theme
Positive sentiments by girls, caregivers, and coaches	Inviting, supportive space
	Inclusive curriculum
	Opportunities for learning
	Developing diverse friendships outside GOTR
Social justice in the curriculum	Mixed viewpoints on social justice
	Coach training and resources on social justice
Access to Girls on the Run programming	Scholarships are essential
	Planning for transportation
	Importance of language translation
Considerations regarding racial diversity	Diversity of GOTR participants
	Diversity of GOTR coaches
Serving gender diverse participants	Considerations regarding gender identity
	Coach training and resources on gender inclusivity

language and race, but accepting who you are and loving who you are … and one of the things we loved was seeing the girls light up each other's Star Power. Those girls could do that so quickly, find ways to compliment each other beyond just superficial … I think it's a lesson that the girls actually take to heart."

Girls commented on the third lower-order theme of *Opportunities for Learning*. When asked about the most interesting topics they learned during lessons, they mentioned appreciating individual differences, Star Power, being yourself, and inner beauty. One participant said, "… people can be different and still sometimes like the same things." Another girl said, "I like the Star Power … because it was like you got to help others when they are kind of sad and then you helped them." Girls also discussed using Star Power in domains outside GOTR, "The Star Power thing helped me in a lot of situations with my friends … [sometimes I would be asked for advice and] I would tell them some advice the Girls on the Run coaches taught me … because they were very clouded and I needed to bring the Star Power to life."

As the fourth lower-order theme, caregivers noted that girls were *Developing Diverse Friendships Outside GOTR*. For example, the tee-shirt given to all GOTR participants helped girls meet friends outside of the program and fostered a connection. A caregiver in the Black/ African American Affinity Group gave this example: "I think [GOTR] promoted [cross-group friendships] without even knowing they actually were doing it … my daughter, when she got her shirt, she wore it to her school. And then some girls there saw it and they had a connection just because they had been in Girls on the Run before, even though they were not in the same program with her … it helped make friendships even outside of Girls on the Run."

Theme 2: social justice in the curriculum (28 quotations)

Caregivers and coaches shared views about whether and how social justice topics should be included in the curriculum and coach training. The first lower-order theme is *Mixed Viewpoints on Social Justice*. Most participants advocated for including social justice topics while others questioned whether it would be appropriate or accepted. A caregiver in the Black/African American Affinity Group said, "It's our reality right now. So, I think it's appropriate and it could be tailored to their age … so they have a better understanding of what's going on …" A caregiver in the Latinx Affinity Group said, "I think it's always important. It helps them to become the leaders of tomorrow and show them there are certain things that we should … stand up for or we should not accept in life."

A coach explained how social justice topics *build on* existing lessons, "I think part of Girls on the Run is getting girls to be comfortable in their own skin and empowering them. And then part of that is taking that empowerment and thinking about other groups of people and how they can use that for good … it's just such an important thing to instill in this age group." By contrast, some coaches felt that using the phrase "social justice" might turn some families away from GOTR. One coach said, "I feel like specific social justice topics … [are] just so riddled with politics and opinion [and] could be misinterpreted …" Other coaches acknowledged that social justice might be taught in ways to avoid offending some families by

focusing lessons on compassion, respect, and standing up for others. One coach said, "I think it's very important … to address [social justice topics] at Girls on the Run, but I am also on board with it through the lens of compassion, and understanding, and respect, because … it will just turn some families off immediately." Some suggested that examples and scenarios already existing in the lessons could be updated to describe girls of various demographic backgrounds. One coach suggested this alternative scenario, "'Your friend won the award that you really wanted. How would you treat her?' Maybe instead it's, 'One of my friends called another one of my friends a racist name. How do you respond and what do you do?'"

Two respondents felt that social justice should be taught at home, not at GOTR. A caregiver in the Disability Affinity Group said, "I think there are definitely aspects [of social justice] that could be talked about but … there are certain things I want to have conversations with my children that I do not feel like anybody else should be talking to them about." A coach *and* caregiver expressed: "… I'm not necessarily signing her [my child] up for an education in social justice. I'm signing her up to live in an experience that she's going to learn about herself, and the people around her. And there's going to be representation from a lot of different people on the team for her to learn about …."

The second lower-order theme is *Coach Training and Resources on Social Justice.* A caregiver in the Latinx Affinity Group expressed the importance of training so that coaches "have the skills to steer the dialogue in the right way." Coaches seemed keen on learning more about how to teach social justice topics and how to answer questions by the girls on their team, acknowledging that they do not feel completely prepared to discuss those topics. Some coaches suggested videos that model how coaches might respond to questions. They praised the safe space that GOTR creates for asking questions, so they anticipated that they will get questions about social justice topics. One coach explained, "Girls on the Run does such a great job of giving space for girls to talk about different things that are happening in life, happening in their school … if I felt equipped to discuss topics of social justice, then I feel like it could be done in a way that could be constructive."

Caregivers and coaches appreciate that GOTR made updates to coach training over the years to include social justice topics. A caregiver in the Latinx Affinity Group said, "… Girls on the Run cares about the girls and cares about what they teach them. And how they want them to be involved within society, to love themselves more and to feel empowerment as a little girl … Because tomorrow … that girl could be our president." A coach explained, "I would say that there was no diversity training whatsoever my first year … But as the world has changed and things evolve, those topics have been worked into the coach training … it's good when you are working with an organization to hear that affirmation like, yes, we hear this is going on, we see you, we know the challenges you are going to face. This is how you may handle it."

Theme 3: access to GOTR programming (24 quotations)

Some caregivers and coaches cited cost, transportation, and language as potential barriers to participating in GOTR and described strategies to help overcome them. The first lower-order theme is *Scholarships are Essential.* Respondents emphasized the importance of financial assistance for increasing access to the program. One coach stated, "… if it wasn't for the scholarship program, then I think it would all be one economic background … The second team I coached was 100% funded by Girls on the Run. And then the other two were a mix, but I couldn't tell the difference. All the girls seem very grateful to be there regardless of how they got there, but I know that there would be a good portion that couldn't be there without funding." A caregiver in the Latinx Affinity Group reinforced this point (in Spanish): "Girls on the Run granted my daughter a scholarship for a percentage of the program cost; As a single mother of three, the financial support allowed my daughter to have this experience; without it we would not have been able to have her participate."

Some coaches explained that their councils put in extra effort to fundraise or form community partnerships to cover fees. One said, "We partnered with our community-based school team to make sure each girl got a new pair of running shoes for the season … we work with our community partners to make sure the girls are equipped to participate properly. Most of our girls are there on scholarship … because it is a pretty high rate of poverty in our school. So, having access to the program … these girls have a safe afterschool program to go to." Another coach explained, "… our council does quite well, as far as making it accessible for anybody … we do unlimited scholarships, and we just fundraise more to cover that."

The second lower-order theme is *Planning for Transportation.* Some respondents discussed that transportation challenges led to dropout or not being able to sign up in the first place. A caregiver in the Latinx Affinity Group described: "Unfortunately, there's no sidewalks where we live. Let's say we did not have a car. We couldn't walk [to where we have practice] without jeopardizing life and limb. Equity would be making available transportation for those girls who needed it … it would be the difference between showing up and not showing up." One coach elaborated, "transportation is always an issue, and it's typically getting home in a school where it was 100% scholarship. Because a lot of parents work, and getting kids home at 5:00 at night can be a really big challenge … one girl ended up falling off a couple practices at the end of the season because she couldn't get a ride home anymore."

Some coaches arranged for transporting girls who needed it to participate. They identified the need early on, stayed late with a participant until their ride arrived, or provided transportation to and/or from practice.[7] One coach said, "I worked really closely … with our community-based team on girls we knew might have a transportation issue, to identify that early and make sure that there was going to be transportation for these girls to get home." One coach explained that prior to COVID-19 they would hold practice at school, so there was no need for transportation to practice. However, during COVID-19 restrictions, they were not allowed to hold practice at school sites which created a transportation barrier. This coach described, "[This last Fall and Spring there was] a single mom that didn't drive. And if she didn't have anybody to take her daughter, then her daughter, wasn't going to be able to participate. So … I just said, 'I'm happy to pick her up. I'm happy to take her home.' Because I really wanted her to participate."

7 According to GOTR policy, coaches can only provide transportation if the caregiver authorizes the coach on their registration paperwork.

The third lower order theme is *Importance of Language Translation*. Some caregivers and coaches said registration materials were available in English and Spanish, but noted they are often not translated to other languages in the community. Respondents also mentioned that while the GOTR website is a great resource, its reach is restricted due to limited language access. Some councils' websites offer multiple languages, and some councils' websites only offer English or both English and Spanish. One coach explained, "I know that there's a family booklet we give out, and it can be in English or Spanish. But there's so much great information on a website, but it's only in English … I've always felt, both for international and the local councils, that it'd be great for families who … speak another language to be able to access that information …."

One coach noticed that some girls would explain GOTR materials to their parents who do not speak English, so their council is trying to resolve this situation, "Our council's working on translating materials like the application packet. Because a lot of our girls fill out the packet themselves and have their parents sign it. So, the parents do not really read through it." One Spanish-speaking caregiver in the Latinx Affinity Group commented on their positive relationship with coaches in making the effort to understand each other. If there is coach turnover, however, this caregiver expressed the need to stay informed: "The teachers who were in charge were all Americans; none of them speak Spanish … If next season the coaches change, I will have to initiate communication … so that I am well connected/informed. Hopefully they are the same coaches, even though they do not speak my language … we try to understand one another … [laughs] They with me and I with them."

Theme 4: considerations regarding racial diversity (18 quotations)

Most respondents felt their teams were diverse, but some discussed a noticeable lack of diversity. There were also mixed perceptions about diversity of the coaches. The first lower-order theme is *Diversity of GOTR Participants*. Most girls, caregivers, and coaches felt their teams were diverse in race, ethnicity, socioeconomic status, and language. A caregiver in the LGBTQIA+ Affinity Group described, "I think because it's not with one school, "we've pulled from a really diverse group of kids … We see different colored faces and … the girls talk about that and they talk about their backgrounds. So, I think that's been really a positive experience for my daughter." Another caregiver in the Latinx Affinity Group said, "At the site I was at, every girl was treated pretty much the same. And my daughter was the only person who was not a Latina at this location. So, I think it was great that she got to be around people that are different from her, but she don't have to feel any different at all. She made great friends, and all of the advisors treated them all well."

A few respondents commented on the apparent lack of diversity on their teams, due to the makeup of their school or community composition. One caregiver in the Latinx Affinity Group said, "It would be very difficult for the teams to be diverse, because I'm pretty certain that the school is 95% White … There might be some Asians, some Latinos. Very few Black people. I think the Girls on the Run group probably reflects that … [The other families on the team] tend to be middle-class, White, highly educated."

The second lower-order theme is *Diversity of GOTR Coaches*. One caregiver noticed and appreciated the coaching diversity on their daughter's team, but others commented on lack of coach diversity and possible financial barriers to being a volunteer coach. A caregiver in the Asian or Multiracial Affinity Group said, "… there's not a really big mix in ethnicities with the coaches … and probably because you have to be able to take time off of work to do that, and a lot of working parents that may add to that diversity may not be available to do so." When asked for suggestions on how GOTR could recruit differently so that coaches are diverse and representative of their teams, a coach of color discussed the financial barrier due to GOTR being an unpaid volunteer experience: "In short of being able to pay coaches, I don't know what else they could do, because I know it is a huge privilege for me to be able to have that much time that I can volunteer, and I know a lot of other women that do not have that privilege."

Theme 5: serving gender diverse participants (8 quotations)

A few caregivers and coaches spoke to the need for more gender-inclusive language in the curriculum and coach resources, particularly on how to have conversations with participants and their families about gender identity. The first lower-order theme is *Considerations Regarding Gender Identity*. Some felt it is important to ask GOTR participants their pronouns and, along with adding "they" with he and she into the curriculum, this would help foster inclusivity. There were also questions about whether the title of the program is non-inclusive for those who are exploring gender identity. One caregiver in the LGBTQIA+ Affinity Group said, "I think it's a little tricky when you've called yourself Girls on the Run, so that might be creating a hurdle. If you think about it from the gender perspective, with so many people now … being very fluid about their gender identity … several of my daughter's friends are thinking about their gender identity right now, and they're coming to Girls on the Run but they're not necessarily identifying as a girl." A coach who identified as queer shared concerns: "I was honestly pretty apprehensive because I don't like how cis-normative it is … the name [Girls on the Run] makes it pretty non-inclusive to non-binary, queer, and/or trans youth. And there was never any conversation about pronouns or self-identified gender when doing introductions in camp … in the curriculum, there's a lot of examples of 'girl slash boy', 'him slash her', where a gender-neutral term could very easily be [used] to further normalize that language for the [participants]."

The second lower-order theme is *Coach Training and Resources on Gender Inclusivity*. Coaches desire training specific to gender identity, both in terms of their own education as well as recommendations for how to talk to participants in an age-appropriate way. One coach said, "… it would be important for coaches to have the resources so that they can, on a personal level, understand the actual things they would be talking about before trying to teach about them. For example, if there was a lesson about gender identity, I think it'd be pretty hard to teach that without prior knowledge and understanding of sex versus gender and the gender spectrum." Another expressed: "… if Girls on the Run changes their perspective [on gender] or expands the way they speak about participants … as a coach I would want some training on how to navigate that with other coaches, parents, and the girls at the level of awareness they are at … talking about this to a third to fifth grader would be much different than talking to a parent. I would want to know what's the recommended language, because just thinking about it makes me cringe … because I can think about all of those questions …."

Discussion

Girls on the Run is an evidence-based PA-PYD program, offering access and equity for diverse and underserved youth and demonstrating efficacy in promoting social, emotional, and behavioral competencies (Jones et al., 2017, 2021; U.S. Department of Health and Human Services, 2019; Weiss et al., 2019, 2020, 2021). The program's mission, vision, and core values embrace an IDEA lens and the organization engages in continuous efforts to revise programming to sustain that commitment. The purpose of the present study was to conduct a large-scale evaluation of the effectiveness with which GOTR is achieving IDEA objectives in their curricular content and delivery. This was accomplished by employing mixed methods with multiple, diverse groups to determine perceptions of curricular offerings, girls' participation experiences, and coach training. In the following paragraphs, we summarize key findings and implications and connect them with literature on strategies for designing equitable and inclusive activities for diverse youth.

Survey responses revealed highly favorable impressions from youth participants, caregivers, and coaches regarding GOTR's efforts to offer accessible, inclusive, and equitable opportunities for girls from diverse backgrounds. In fact, *all* items were scored above "agree" with the majority "strongly agree" for the quality and relevance of learning experiences that reflect an IDEA lens. That is, the practice environment is characterized as a safe, welcoming, and inclusive space, and activities are designed in a culturally responsive way for girls and families of all racial and ethnic backgrounds. Girls engage in valuable opportunities for learning behavioral and social–emotional skills that generalize beyond the program, such as ability to form diverse friendships in varied social contexts. Caregivers and coaches alike agreed that girls are valued for who they are as a person regardless of cultural background as well as (dis)ability or English Learner status. Positive perceptions prevailed among White *and* BIPOC groups regarding programming from an IDEA lens.

Focus groups and interviews added detailed narrative to clarify, explain, and interpret the high survey ratings. Positive sentiments predominated discussions among various affinity groups, supporting and elaborating upon survey findings that GOTR is characterized as an inviting, supportive space; the lessons are inclusive and culturally responsive; opportunities for learning social–emotional skills abound; and identifying as a GOTR participant lends opportunities for forming friendships with diverse peers. The social justice theme revealed that coaches and caregivers value lessons on compassion, respect, and standing up for others, and they praised GOTR for creating a safe space for participants to ask questions. Coaches appreciated GOTR's continued efforts to update training related to social justice, but they also desired additional training and resources. Access to programming despite potential barriers was deemed successful due to scholarship funding, options for resolving transportation challenges, and efforts to translate communications to families. Collectively, quantitative and qualitative findings revealed opportunities for skill building, a sense of belonging, and supportive relationships, among other features, that align with evidence-based best practices for promoting PYD among diverse youth (Deutsch et al., 2017; Simpkins et al., 2017; Smith et al., 2017; Jones et al., 2021).

Although the majority of qualitative responses supported favorable survey ratings, some caregivers and coaches voiced alternative perspectives about social justice in the curriculum, access to programming, and gender diversity. Though fewer in number, their expressions are valuable and provide insights for reinforcing GOTR's pledge to "bring diverse voice to the table as we know that unique perspectives strengthen the quality and scope of our organization." Interviewees frequently affirmed the importance of including social justice in the lessons, but contrary views raised the potential for "turning families off" or that values should be "taught at home, not at GOTR." A large percentage of caregivers (81%) and coaches (86%) agreed or strongly agreed with, "importance of including social justice content in the lessons," but greater variability of opinions existed on this topic than others. It should be noted that respondents were not asked whether social justice topics are *already* included in the curriculum, which some are (e.g., standing up for others, embracing differences, empathy, and community impact project). Rather, caregivers were asked, "how important is it to you" that GOTR content includes social justice topics. Thus, caregivers may not be aware of existing lessons on social justice and, indeed, findings indicated that many are not familiar with the lessons their children experience. Thus, more dialogue is needed among GOTR administrators, families, and coaches to share what is included in curriculum content and how to deliver it in an age-appropriate way.

Multiple viewpoints about what IDEA content is taught to elementary-age youth pose an important opportunity to sustain GOTR's pledge of ensuring a culturally responsive approach to designing activities for *all* youth. A keystone of effective PYD programs is "integration of family, school, and community efforts" (Eccles and Gootman, 2002; Simpkins et al., 2017), so making curricular decisions along an IDEA lens will benefit from candid discussions and collaborations among GOTR personnel, caregivers, coaches (many who are school teachers), and community leaders. The social-ecological model (Bronfenbrenner and Morris, 1998) and developmental systems models (Sameroff, 2010; Lerner, 2017) highlight the *interactive influence* of significant others (e.g., caregivers, teachers, coaches) and social contexts (e.g., schools, organized activities, cultural norms) on children's acquisition of beliefs, attitudes, and behaviors. Developing youths' moral values toward social justice, such as standing up against discrimination, bias, and prejudice, will be achieved through a concerted effort by respected individuals in their social system. GOTR is strategically positioned, alongside family, school, and community, to influence morals and values that respect racial, ethnic, and cultural diversity.

Coaches expressed confidence in GOTR's comprehensive training for preparing them with the knowledge and skills to work with participants of diverse backgrounds. Focus groups and interviews revealed a desire for additional training on strategies to teach social justice topics and answer questions in an age-appropriate manner. GOTR is continually updating coach training to include relevant content and effective methods that engage coaches in problem-solving and decision-making. Training modules include social issues and scenarios inclusive of girls with diverse backgrounds. Coaches are required to complete the entire training covering consistent lesson delivery, disability inclusion, and trauma-informed instruction. A challenge for GOTR has been ensuring that coaches fulfill all of these modules prior to the season. Findings prompt further interest in training experiences that include content, activities, and methods for addressing topics in a culturally and developmentally-appropriate way.

BIPOC coaches reported greater ability to work with girls of diverse backgrounds (small effect size), an important revelation given

that over 80% of coach survey respondents were White. Predominance of White coaches naturally raises the need for recruiting coaches who are racially, ethnically, and culturally diverse. Youth are more likely to identify with models who are similar in characteristics such as race, ethnicity, and culture, which results in greater motivation to learn and adopt behaviors and skills being taught (Weiss and Wiese-Bjornstal, 2009). Respondents did not readily provide strategies for attracting more diverse coaches, so this is another area of collaboration among GOTR personnel, families, and community. This has been and continues to be an organizational priority. Interestingly, some participants paired lack of coach diversity with inability to volunteer due to work commitments, suggesting that diverse coach recruitment may also be related to social class disparities.

Survey responses suggested access to and equity in participation, for example through scholarships, partnering with NCHPAD to enable accommodations, and communications in English and Spanish. Caregivers strongly agreed that their child felt included in all activities and participated equally to peers. Coaches praised their council for providing resources to offset barriers families might face in accessing GOTR. In focus groups and interviews, which featured greater participant diversity, some caregivers and coaches expressed concerns that disadvantaged families faced financial, transportation, and language barriers. They voiced a need to further reduce disparities by providing more scholarships, fundraising opportunities, transportation options, and translation to languages other than just English and Spanish. These barriers to accessing participation—financial, transportation, and language—are common for out-of-school-time programs and especially affect families of color, lower income, and migrant status (Simpkins et al., 2017; Smith et al., 2017).

While focus groups/interviews mostly revolved around access and inclusion based on racial, cultural, and socioeconomic diversity, "serving *gender diverse* participants" emerged as a theme among a smaller but vocal group of coaches and caregivers. Some recommended more gender-inclusive language in the curriculum and the need for more training and resources to effectively teach lessons and answer youths' questions in an age-appropriate way. GOTR welcomes youth who are non-binary or gender-nonconforming and want to participate in a girl-centered program. Thus, the program is inclusive of diverse gender identities, but this information may not be known or noticed by families. GOTR can explore ways to make the Grown-Up Guide (resource for caregivers) more accessible and reinforce the importance of caregivers investing time to engage with their child on social issues, which again invokes the importance of youth learning from multiple individuals in their social system.

PYD and SEL researchers highlight challenges and strategies for designing culturally responsive activities (Whitley et al., 2015; Forneris et al., 2016; Deutsch et al., 2017; Simpkins et al., 2017; Jones et al., 2021). Simpkins et al. offered a framework for designing activities to meet the needs of racially-and ethnically-diverse youth by mapping strategies onto the eight contextual features of effective PYD programs (Eccles and Gootman, 2002). They argue that scarce attention has been given to cultural competence as a life skill, and afterschool activities are prime contexts for assisting racially and ethnically diverse youth in attaining skills such as resolving cultural differences and exploring identities. Their framework and strategies offer a roadmap for GOTR and other programs to optimize equitable participation for diverse youth, especially underserved and marginalized youth who have the most to gain from a program delivered by caring and supportive adults who provide appropriate structure, positive norms, and support for autonomy and belonging (Simpkins et al., 2017; Smith et al., 2017).

Self-selection is one of the limitations of the study. Councils chose whether to participate in the study and respondents voluntarily opted into completing the survey and/or participating in a focus group or interview. Thus, favorable survey ratings and focus group/interview responses may be elevated as a result of the voluntary nature of participation and not having potentially differing opinions by those who chose not to participate. Second, we were able to capture many aspects of diversity such as race, ethnicity, ability, socioeconomic status, language, and gender identity, which are regarded *visible* forms of diversity. A limitation is that we were unable to assess aspects of *invisible* diversity, such as ways of thinking, learning, processing, communicating, and behaving (i.e., neurodiversity). Future research evaluating PA-PYD program impact might consider ways to assess both visible and invisible forms of diversity. Finally, GOTR programming transitioned to offering three delivery modes from Spring 2020 to Spring 2021: 100% virtual, 100% in-person, and hybrid. These variations may have affected how girls, caregivers, and coaches perceived experiences, although Fall 2020 season findings showed that all modes were received favorably by caregivers and coaches and open-ended narrative revealed evidence of season-long impact (Weiss et al., 2021). Due to these limitations—participant self-selection, not assessing invisible forms of diversity, and variations in program delivery—the results of this study may not generalize to other populations and programs.

In conclusion, collective findings from quantitative and qualitative data characterized GOTR as being successful in meeting the pledge of inclusion, diversity, equity, and access to participation. All groups provided information that recognizes GOTR's positive impact on girls' social and emotional learning; they also provided diverse voices and varied perspectives needed for fulfilling GOTR's promise of "… fostering an atmosphere of community connectedness that serves as a model for our girls and community members." GOTR lessons and coach training align with evidence-based strategies for inclusive and equitable programming, which can serve as an exemplar for other out-of-school-time programs. Varied opinions on social justice issues such as racial, socioeconomic, and gender inclusivity provide GOTR with additional areas of opportunity for sustaining their commitment to providing a culturally responsive space for *all* youth and achieving goals of promoting children's healthy behaviors and life skills now and in the future.

Data availability statement

The data analyzed in this study are subject to the following licenses/restrictions: the datasets presented in this article are not readily available because they are proprietary to Girls on the Run International. Requests about the data should be directed to AR, ariley@girlsontherun.org.

Ethics statement

The project was reviewed by Research Integrity and Compliance (RIC), Texas State University, San Marcos, TX, USA. Because the

study exclusively involved the examination of anonymous, secondary data, the research is not regulated by RIC, and written informed consent for participation was not required.

Author contributions

MW and LK drafted the early versions of the manuscript, analyzed the quantitative data, and interpreted the qualitative themes. AR provided the secondary data set. All authors conceived the study, contributed to revising the manuscript, and approved the final submitted version.

Acknowledgments

The authors are very grateful to the following MAEC evaluation team members: Kasia Razynska led the external review and facilitated focus groups and interviews; Mira Best led coding of transcripts and initial qualitative analysis. Both provided feedback on an earlier version of the manuscript. We thank other MAEC personnel who contributed as facilitators, notetakers, transcribers, data coders, and analysts: Graciela Cortez, Dannele Ferreras, Carol Gant, Jenny Portillo, Mariela Puentes, Karmen Rouland, Claire Ruhlman, Nikevia Thomas, and Vo Ram Yoon. We are also grateful to members of the GOTR programming and evaluation team for their assistance in all aspects of this project: Katarina Corda, Sydney Mack, Gloria Monahan, and Elena Simpkins.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Publisher's note

References

Arellano, A., Halsall, T., Forneris, T., and Gaudet, C. (2018). Results of a utilization-focused evaluation of a right to play program for indigenous youth. *Eval. Program Plann.* 66, 156–164. doi: 10.1016/j.evalprogplan.2017.08.001

Banda, J. A., and Robinson, T. N. (2017). "Children and screen time" in *Sedentary behavior and health: concepts, assessments, and interventions*. eds. W. Zhu and N. Owen (Champaign, IL: Human Kinetics), 56–70. doi: 10.5040/9781492595861.ch-005

Bean, M. K., Miller, S., Mazzeo, S. E., and Fries, E. A. (2012). Social cognitive factors associated with physical activity in elementary school girls. *Am. J. Health Behav.* 36, 265–274. doi: 10.5993/AJHB.36.2.11

Benson, P. L. (2006). *All kids are our kids: what communities must do to raise caring and responsible children and adolescents 2nd*. San Francisco, CA: Jossey-Bass.

Bronfenbrenner, U., and Morris, P. A. (1998). "The ecology of developmental processes," in *Handbook of child psychology: theoretical models of human development 5th.*, series ed. W. Damon, volume ed. R.M. Lerner (New York, NY: Wiley), 993–1028.

Cohen, J. A. (1988). *Statistical power analysis for the behavioral sciences 2nd*. Hillsdale, NJ: Erlbaum.

Damon, W. (2004). What is positive youth development? *Ann. Am. Acad. Pol. Soc. Sci.* 591, 13–24. doi: 10.1177/0002716203260092

Designed to Move: a physical activity action agenda. (2012). Available at: https://www.sportsthinktank.com/research,117856.html

Deutsch, N. L., Blyth, D. A., Kelley, J., Tolan, P. H., and Lerner, R. M. (2017). "Let's talk after-school: the promises and challenges of positive youth development for after-school research, policy, and practice" in *After-school programs to promote positive youth development: integrating research into practice and policy*. ed. N. L. Deutsch, vol. *1* (New York, NY: Springer), 45–68.

Donnelly, J. E., Hillman, C. H., Castelli, D., Etnier, J. L., Lee, S., Tomporowski, P., et al. (2016). Physical activity, fitness, cognitive function, and academic achievement in children: a systematic review. *Med. Sci. Sports Exerc.* 48, 1197–1222. doi: 10.1249/MSS.0000000000000901

Dzewaltowski, D. W., and Rosenkranz, R. R. (2014). Youth development: an approach for physical activity behavioral science. *Kinesiol. Rev.* 3, 92–100. doi: 10.1123/kr.2014-0042

Eccles, J. S., and Gootman, J. A. (2002). "Features of positive developmental settings" in *Community programs to promote youth development*. eds. J. S. Eccles and J. A. Gootman (Washington, DC: National Academy Press), 86–118.

Eime, R. M., Young, J. A., Harvey, J. T., Charity, M. J., and Payne, W. R. (2013). A systematic review of the psychological and social benefits of participation in sport for children and adolescents: informing development of a conceptual model of health through sport. *Int. J. Behav. Nutr. Phys. Act.* 10:98. doi: 10.1186/1479-5868-10-98

Forneris, T., Bean, C., and Halsall, T. (2016). "Positive youth development programming with marginalized populations" in *Positive youth development through sport*. ed. N. L. Holt. *2nd* ed (New York, NY: Routledge), 168–179.

Fredricks, J. A., Naftzger, N., Smith, C., and Riley, A. (2017). "Measuring youth participation, program quality, and social and emotional skills in after-school programs" in *After-school programs to promote positive youth development: integrating research into practice and policy*. ed. N. L. Deutsch, vol. *1* (New York, NY: Springer), 23–43.

Goodway, J. D., and Robinson, L. E. (2015). Developmental trajectories in early sport specialization: a case for early sampling based on a physical growth and motor development perspective. *Kinesiol. Rev.* 4, 267–278. doi: 10.1123/kr.2015-0028

Hellison, D. (2011). *Teaching personal and social responsibility through physical activity 3rd edn*. Champaign, IL: Human Kinetics.

Hillman, C. H., Erickson, K. I., and Hatfield, B. D. (2017). Run for your life! Childhood physical activity effects on brain and cognition. *Kinesiol. Rev.* 6, 12–21. doi: 10.1123/kr.2016-0034

Jones, S., Brush, K., Bailey, R., Brion-Meisels, G., McIntyre, J., Kahn, J., et al. (2017). *Navigating SEL from the inside out: looking inside & across 25 leading SEL programs: a practical resource for schools and OST providers*. Cambridge, MA: Harvard Graduate School of Education.

Jones, S., Brush, K., Ramirez, T., Mao, Z. X., Marenus, M., Wettje, S., et al. (2021). *Navigating SEL from the inside out: looking inside & across 33 leading SEL programs: a practical resource for schools and OST providers 2nd*. Cambridge, MA: Harvard Graduate School of Education.

Larson, R. W. (2000). Toward a psychology of positive youth development. *Am. Psychol.* 55, 170–183. doi: 10.1037/0003-066X.55.1.170

Larson, R. W., Hansen, D. M., and Moneta, G. (2006). Differing profiles of developmental experiences across types of organized youth activities. *Dev. Psychol.* 42, 849–863. doi: 10.1037/0012-1649.42.5.849

Leman, P. J., Smith, E. P., and Petersen, A. C.SRCD Ethnic-Racial Issues and International Committees (2017). Introduction to the special section of child development on positive youth development in diverse and global contexts. *Child Dev.* 88, 1039–1044. doi: 10.1111/cdev.12860

Lerner, R. M. (2017). Commentary: studying and testing the positive youth development model: a tale of two approaches. *Child Dev.* 88, 1183–1185. doi: 10.1111/cdev.12875

Lerner, R. M., Almerigi, J. B., Theokas, C., and Lerner, J. V. (2005). Positive youth development: a view of the issues. *J. Early Adolesc.* 25, 10–16. doi: 10.1177/0272431604273211

Lerner, R. M., and Lerner, J. V. (2006). "'Toward a new vision and vocabulary about adolescence: theoretical, empirical, and applied bases of a "positive youth development" perspective" in *Child psychology: a handbook of contemporary issues*. eds. L. Balter and C. S. Tamis-LeMonda (New York, NY: Psychology Press), 445–469.

Mahoney, J. L., Larson, R. W., Eccles, J. S., and Lord, H. (2005). "Organized activities as development contexts for children and adolescents" in *Organized activities as contexts of development: extracurricular activities, after-school and community programs*. eds. J. L. Mahoney, R. W. Larson and J. S. Eccles (Hillsdale, NJ: Erlbaum), 3–22.

Moore, K. A. (2017). Commentary: positive youth development goes mainstream. *Child Dev.* 88, 1175–1177. doi: 10.1111/cdev.12874

Petitpas, A. J., Cornelius, A. E., Van Raalte, J. L., and Jones, T. (2005). A framework for planning youth sport programs that foster psychosocial development. *Sport Psychol.* 19, 63–80. doi: 10.1123/tsp.19.1.63

Pfeiffer, K. A., and Wierenga, M. J. (2019). Promoting physical activity through youth sport. *Kinesiol. Rev.* 8, 204–210. doi: 10.1123/kr.2019-0033

Pittman, K. (2017). "Why after-school matters for positive youth development" in *After-school programs to promote positive youth development: integrating research into practice and policy*. ed. N. L. Deutsch, vol. *1* (New York, NY: Springer), 1–12. doi: 10.1007/978-3-319-59132-2_1

Ramey, H. L., and Rose-Krasnor, L. (2011). Contexts of structured youth activities and positive youth development. *Child Dev. Perspect.* 6, 85–91. doi: 10.1111/j.1750-8606.2011.00219.x

Riley, A., and Britt, H. (2017). "Girls on the Run" in *Sage encyclopedia of out-of-school learning*. ed. K. Peppler (Thousand Oaks, CA: Sage), 325–327.

Roth, J. L., and Brooks-Gunn, J. (2003). What exactly is a youth development program? Answers from research and practice. *Appl. Dev. Sci.* 7, 94–111. doi: 10.1207/S1532480XADS0702_6

Sameroff, A. (2010). A unified theory of development: a dialectic integration of nature and nurture. *Child Dev.* 81, 6–22. doi: 10.1111/j.1467-8624.2009.01378.x

Simpkins, S. D. (2015). When and how does participating in an organized after-school activity matter? *Appl. Dev. Sci.* 19, 121–126. doi: 10.1080/10888691.2015.1056344

Simpkins, S. D., Riggs, N. R., Ngo, B., Vest Ettekal, A., and Okamoto, D. (2017). Designing culturally responsive organized after-school activities. *J. Adolesc. Res.* 32, 11–36. doi: 10.1177/0743558416666169

Smith, E. P. (2007). The role of afterschool settings in positive youth development. *J. Adolesc. Health* 41, 219–220. doi: 10.1016/j.jadohealth.2007.06.010

Smith, E. P., Witherspoon, D. P., and Osgood, D. W. (2017). Positive youth development among diverse racial-ethnic children: quality afterschool contexts as developmental assets. *Child Dev.* 88, 1063–1078. doi: 10.1111/cdev.12870

Stuntz, C. P., and Weiss, M. R. (2010). Motivating children and adolescents to sustain a physically active lifestyle. *Am. J. Lifestyle Med.* 4, 433–444. doi: 10.1177/1559827610368779

Tabachnick, B. G., and Fidell, L. S. (eds.). (2019). *Using multivariate statistics 7th*. Boston, MA: Pearson.

Terre des hommes (2019). *Using focus group discussions with children and adolescents: a practical guide for Maximising their effectiveness*. Lausanne, Switzerland: Terre des hommes.

Tremblay, M. S., Barnes, J. D., Gonzalez, S. A., Katzmarzyk, P. T., Onywera, V. O., Reilly, J. J., et al. (2016). Global matrix 2.0: report card grades on the physical activity of children and youth comparing 38 countries. *J. Phys. Act. Health* 13, S343–S366. doi: 10.1123/jpah.2016-0594

U.S. Department of Health and Human Services. (2018). *Physical activity guidelines for Americans 2nd*. Washington, DC: U.S. Department of Health and Human Services.

U.S. Department of Health and Human Services (2019). *National youth sports strategy*. Washington, DC: U.S. Department of Health and Human Services.

Ullrich-French, S., and Cole, A. N. (2018). Exploring participant characteristics in an assessment of changes in psychosocial outcomes in a physical activity-based positive youth development programme for girls. *Int. J. Sport. Exerc. Psychol.* 16, 535–554. doi: 10.1080/1612197X.2016.1275740

Ward, S., and Parker, M. (2013). The voice of youth: atmosphere in positive youth development program. *Phys. Educ. Sport Pedagogy* 18, 534–548. doi: 10.1080/17408989.2012.726974

Weiss, M. R. (2011). Teach the children well: a holistic approach to developing psychosocial and behavioral competencies through physical education. *Quest* 63, 55–65. doi: 10.1080/00336297.2011.10483663

Weiss, M. R. (2019). "Positive youth development through physical activity: progress, puzzles, and promise" in *Advances in sport and exercise psychology*. eds. T. S. Horn and A. L. Smith. *4th* ed (Champaign, IL: Human Kinetics), 483–502.

Weiss, M. R., Kipp, L. E., and Bolter, N. D. (2012). "Training for life: optimizing positive youth development through sport and physical activity" in *Handbook of sport and performance psychology*. ed. S. M. Murphy (New York, NY: Oxford University Press), 448–475.

Weiss, M. R., Kipp, L. E., Phillips Reichter, A., and Bolter, N. D. (2020). Evaluating Girls on the Run in promoting positive youth development: group comparisons on life skills transfer and social processes. *Pediatr. Exerc. Sci.* 32, 172–182. doi: 10.1123/pes.2019-0252

Weiss, M. R., Kipp, L. E., Phillips Reichter, A., Espinoza, S. M., and Bolter, N. D. (2019). Girls on the Run: impact of a physical activity youth development program on psychosocial and behavioral outcomes. *Pediatr. Exerc. Sci.* 31, 330–340. doi: 10.1123/pes.2018-0168

Weiss, M. R., Kipp, L. E., and Riley, A. (2021). "A piece of sanity in the midst of insane times": Girls on the Run programming to promote physical activity and psychosocial well-being during the COVID-19 pandemic. *Front. Public Health* 9:729291. doi: 10.3389/fpubh.2021.729291

Weiss, M. R., and Wiese-Bjornstal, D. M. (2009). Promoting positive youth development through physical activity. *Pres. Counc. Phys. Fit. Sports Res. Dig.* 10, 1–8.

Whitley, M. A., Forneris, T., and Barker, B. (2015). The reality of sustaining community-based sport and physical activity programs to enhance the development of underserved youth: challenges and potential strategies. *Quest* 67, 409–423. doi: 10.1080/00336297.2015.1084340

frontiers | Frontiers in Psychology

TYPE Original Research
PUBLISHED 16 May 2023
DOI 10.3389/fpsyg.2023.1195746

OPEN ACCESS

EDITED BY
Pedro Rosário,
University of Minho, Portugal

REVIEWED BY
Vítor Gamboa,
University of Algarve, Portugal
Maura Pilotti,
Prince Mohammad bin Fahd University,
Saudi Arabia

*CORRESPONDENCE
Vera Coelho
✉ vcoelho@umaia.pt

†These authors have contributed equally to this work and share first authorship

RECEIVED 28 March 2023
ACCEPTED 26 April 2023
PUBLISHED 16 May 2023

CITATION
Coelho V, Peixoto C, Azevedo H, Machado F, Soares M and Espain A (2023) Effects of a Portuguese social–emotional learning program on the competencies of elementary school students.
Front. Psychol. 14:1195746.
doi: 10.3389/fpsyg.2023.1195746

Effects of a Portuguese social–emotional learning program on the competencies of elementary school students

Vera Coelho[1,2*†], Carla Peixoto[1,3†], Helena Azevedo[1], Francisco Machado[1], Mónica Soares[1,4] and Andreia Espain[5]

[1]University of Maia, Department of Social and Behavioral Sciences, Research Unit in Psychology and Human Development, Maia, Portugal, [2]Center for Psychology at the University of Porto, Porto, Portugal, [3]Center for Research and Innovation in Education (inED), School of Education, Porto Polytechnic, Porto, Portugal, [4]Higher School of Education of Paula Frassinetti, Porto, Portugal, [5]Associação Mente de Principiante, Maia, Portugal

Introduction: It is widely recognized that socio-emotional learning (SEL) interventions can contribute to supporting students' positive development of socio-emotional skills (SES) and positive relationships with peers and teachers. Thus, interest in promoting students' SES through universal evidence-based programs is spreading around the world, including in Portuguese schools.

Methods: This quasi-experimental study examines the efficacy of a SEL classroom-based program, infused into the curriculum, on students' communication, self-regulation, and classroom peer relationships. Participants included 208 third- to fourth-grade students from three Portuguese public elementary schools: 143 in the intervention group (54.5% boys; M_{age} = 8.72; *SD* = 0.61); 65 in the comparison group (52.3% boys; M_{age} = 8.66; *SD* = 0.59). Measures included: Study on Social and Emotional Skills, parent, child, and teacher versions; and Classroom Peer Context Questionnaire, completed by students. The study followed a pre- and post-test design, with a 16-week intervention.

Results: For the overall participants, results show a positive effect of the program on students' assertiveness (family report), peer conflict and peer cooperation. Effects were analyzed separately by school grade. A statistically significant positive effect of the program on third-grade students' assertiveness and sociability was found. For fourth-grade students, a positive effect was found on - emotional control). classroom conflicts, isolation, cooperation and cohesion behaviors.

Discussion: These positive effects support the expansion of universal interventions when aiming at strengthening SEL in Portuguese school settings, underlining the relevance of embedding SEL into the curricula and daily practices at schools.

KEYWORDS

socio emotional learning, universal intervention, elementary school, self-regulation, communication, classroom peer relationships

1. Introduction

Social–emotional learning (SEL) is an educational model aimed at improving students' social–emotional skills (SES). SEL is usually defined as the process through which students develop a set of interrelated competencies that allow them to recognize and manage their emotions, set and achieve goals, and engage in responsible decision-making processes and

positive interactions through the development, for instance, of perspective-taking, conflict management, and relationship skills [e.g., Collaborative for Academic, Social, and Emotional Learning (CASEL), 2021]. In the last decades, there has been an evident and growing interest in SEL, particularly in the field of educational psychology, as research shows that SEL fosters students' SES, thus improving their ability to solve problems and engage in positive relationships with others and increasing their chances of success, both academically during their school years and throughout their adult lives (e.g., Weare and Nind, 2011; Pinto and Raimundo, 2016; Greenberg et al., 2017; Marchante and Coelho, 2021). Positive short- and long-term effects of SEL for students' lives are underlined in the literature (e.g., Bradshaw et al., 2009; Durlak et al., 2011; Taylor et al., 2017). Therefore, in a constantly changing world, helping children and young people to develop the skills they need to thrive throughout their academic, professional, social, and personal lives becomes of paramount importance.

Schools are in a pivotal position to foster students' SES, as children and adolescents spend a significant amount of their time in these environments and face several challenges, both academic and social, during schooling that require SES for positive development and learning [Greenberg et al., 2017; Nakano et al., 2019; Collaborative for Academic, Social, and Emotional Learning (CASEL), 2021]. Therefore, efforts to promote students' SES through universal evidence-based SEL programs in schools are spreading around the world, including in Portuguese schools (Pinto and Raimundo, 2016; Bowles et al., 2017). The number of SEL programs has increased worldwide, as has the search for evidence of their efficacy. Nevertheless, the need to expand the research on developmentally appropriate SEL programs remains, particularly in Portugal, where several SEL programs have been developed and implemented in the last decades. In view of these considerations, the present study aims to analyze the effects of a SEL classroom-based program, infused into the curriculum, on the communication, self-regulation, and classroom peer relationships of elementary school aged children.

1.1. School-based universal social–emotional learning

Schools are considered a primary developmental context for children and adolescents, playing a central role in the promotion of students' development of important life skills, including SES (Weissberg and Elias, 1993; Greenberg et al., 2017). Therefore, SEL has been described in the literature as a fundamental part of education (e.g., Durlak et al., 2011; Jones et al., 2015; Oberle et al., 2016). Research provides evidence that SES have an important impact on various developmental outcomes, including children's school success and positive peer relations and emotional state (e.g., Jones et al., 2015; Greenberg et al., 2017; Ștefan et al., 2022), with lasting effects reported over time (e.g., Bradshaw et al., 2009; Denham et al., 2012; Taylor et al., 2017; Denham, 2018). Given the above, ensuring that SEL becomes an integral part of educational contexts, by including it in the school curriculum and culture (Domitrovich et al., 2010, 2017; Weare and Nind, 2011; Weissberg et al., 2015; Greenberg et al., 2017), is indispensable for achieving a healthy school climate. In this regard, schools are taking care to incorporate high-quality SEL interventions into their daily classroom practices, recognizing that academic skills and SES are interdependent and inseparable and should be developed jointly at school from an early age (FitzPatrick et al., 2014; Blewitt et al., 2020).

School-based universal SEL programs have been associated with positive outcomes for students (across all grade levels), such as the improvement of academic performance and SES and the reduction of stress levels and behavioral problems (Durlak et al., 2011). In their landmark systematic review, Durlak et al. (2011) underline that the development of SES contributes to better school adaptation and involvement, being associated with motivation for academic achievement. Moreover, when delivered effectively, SEL programs are associated with significant, and possibly long-lasting, benefits for different areas of students' lives, including academic, personal, social, and professional areas. Studies show that the implementation of SEL programs at an early age is effective in fostering learning, a positive school climate, positive relationships, a positive self-concept, and increased well-being, as well as in decreasing behavior problems, drug use, and emotional distress (Durlak et al., 2011; Durlak, 2015; Taylor et al., 2017). Moreover, evidence from longitudinal studies indicates that such positive effects may persist for over 15 years on social, emotional, and behavioral outcomes (e.g., Taylor et al., 2017). Along the same lines, Greenberg et al. (2017) report that children with higher SES are more likely to succeed in their careers, develop positive relationships, have balanced mental health, and become engaged citizens later in life.

Nevertheless, there are contradictory findings (e.g., Zeidner et al., 2002; Carroll et al., 2020), with some studies reporting little to no evidence of effectiveness and recognizing that there is a need for greater efficiency in delivering universal SEL programs in schools without compromising implementation quality (Domitrovich et al., 2010). Consequently, the need to discuss both the quality of the intervention/program and the quality of its implementation has been emphasized (Durlak and DuPre, 2008). For instance, the quality of the implementation and dosage were identified as primary limitations of school-based SEL programs, associated with the lack of effectiveness of interventions (e.g., Embry and Biglan, 2008; Jones and Bouffard, 2012). Thus, a set of quality characteristics have been identified for universal SEL interventions, as well-designed and well-implemented school-based SEL programs are deemed the most likely to improve children's outcomes (e.g., Durlak et al., 2011; Bierman and Motamedi, 2015; Taylor et al., 2017; Voith et al., 2020; Mahoney et al., 2021; Ștefan et al., 2022). Overall, it is recommended that SES are be promoted in safe and caring learning contexts by engaging teachers, other school team members, children, and families in SEL practices that build relationships in the school community and improve child competencies (Durlak et al., 2011).

In Portugal, in the past few years, the number of SEL programs in educational settings has also increased (Pinto and Raimundo, 2016; Bowles et al., 2017; Cristóvão et al., 2017; Peixoto and Coelho, 2022), particularly in elementary and middle schools (e.g., Raimundo et al., 2013; Coelho et al., 2016; Coelho and Sousa, 2017). An important contribution to this increase was the investment made by the Calouste Gulbenkian Foundation through the "Gulbenkian Academies for Knowledge."[1] Between 2018 and 2021, the Calouste Gulbenkian

1 https://gulbenkian.pt/academias/

Foundation financially supported around 100 projects aiming to promote key SES in children and youth under 25 years of age, including the school-based universal intervention program "Calmly – Learning to Learn Yourself" [Calmamente—Aprendendo a Aprender-se]. Despite the increased investment on school-based SEL interventions, there seems to be a lack of knowledge of their effects on children attending Portuguese elementary schools, since experimental studies are scarce (e.g., Raimundo et al., 2013).

1.2. Social–emotional skills and social–emotional learning

Although there are a multitude of frameworks that address the field of socio-emotional skills, sometimes using different terminology to define and organize this research area (Taxonomy Project, n.d.; Berg et al., 2019; Djamnezhad et al., 2021), all frameworks include a large set of interrelated competencies [see Taxonomy Project, n.d.; OECD, 2019; Collaborative for Academic, Social, and Emotional Learning (CASEL), 2021]. Our study focused on self-regulation and communication skills due to their role in supporting relationships and children's ability to manage their behaviors and emotions. Self-regulation skills in particular have been widely studied over the past years, with evidence supporting their associations with several child outcomes, such as learning, adjustment, engagement behaviors, and social competencies (e.g., Eisenberg et al., 2001; Olson et al., 2005; McClelland et al., 2007; Williford et al., 2013). Negative associations between self-regulation and later behavior problems have also been highlighted (e.g., Murray and Kochanska, 2002; Hughes and Ensor, 2011; Sawyer et al., 2015), with both emotional and behavioral regulation underlined as key aspects of self-regulation for children to adequately respond to academic and social demands in educational setting. Self-regulation skills have been constantly associated with decreased behavioral problems and increased engagement and prosocial behaviors across school years (e.g., Olson et al., 2005; Carlson and Wang, 2007; McClelland et al., 2007; Sawyer et al., 2015). For instance, research has demonstrated that students who participated in interventions focused on self-regulation show significant improvements in academic performance. In this scope, Durlak et al. (2011) found that students who participated in SEL programs focused on self-regulation showed significant improvements in academic achievement. Another study by Raver et al. (2011) found that kindergarten students who participated in an intervention that focused on self-regulation showed significant improvements in both academic achievement and behavior. Along the same lines, communication skills have also been widely studied, with the literature reinforcing that they are associated with important milestones of children's socio-emotional development (e.g., Heberle et al., 2020; Rautakoski et al., 2021), being specifically identified as part of the core competencies for establishing and maintaining healthy and supportive relationships [e.g., Collaborative for Academic, Social, and Emotional Learning (CASEL), 2021]. Communication difficulties can negatively affect social interaction as well as emotional and self-regulation (e.g., St Clair et al., 2019), making it crucial for children's success to develop a set of communication skills that allow them to function in different settings. Moreover, effective communication skills have been associated with better academic achievement and self-regulation outcomes (e.g., Ramsook et al., 2020). Hence, it is relevant that SEL interventions can foster children's abilities to communicate clearly, listen, cooperate, and work collaboratively, which are key aspects for the learning process and consequently for academic achievement. Studies have investigated the relationship between SEL interventions and students' self-regulation and communication. Studies found that students participating in SEL programs that focused on communication showed significant improvements in academic achievement and social competence (e.g., Jennings and Greenberg, 2009).

1.3. Classroom peer relationships and social–emotional learning

Schools, and particularly classrooms, are pivotal contexts for social interactions, challenging children to develop interactions and relationships among each other, promoting a positive classroom climate (e.g., Ladd, 2005; Denham et al., 2012; Boor et al., 2016). The literature on school climate and SEL highlights the role of relationships in school success and sense of well-being and quality of life (Thapa et al., 2013). It is recognized that SEL interventions serve as a way of fostering positive relationships with peers, teachers, school staff, and families, contributing for students' ability to establish and maintain healthy relationships through effective communication, social engagement, and more collaborative teamwork [Collaborative for Academic, Social, and Emotional Learning (CASEL), 2017].

Peer relationships in classroom context are described as a relevant dimension for processual quality of classroom contexts (e.g., Luckner and Pianta, 2011; Rivers et al., 2013; Madill et al., 2014), which means that high quality relationships between peers in classrooms tend to promote children's academic success and well-being (e.g., Androutsou and Anastasiou, 2014; Maxwell et al., 2017; Konold et al., 2018). These relationships are described as a complex phenomenon, with some authors proposing that to fully understand them we need to consider different levels of analysis, namely: individual level (e.g., characteristics children bring to social interaction, such as their social orientation to peers, social skills, and knowledge), interactional level (e.g., children's dyadic day-to-day interactions and behaviors), relational level (meanings, expectations, and emotions that children have and express toward each other), and group level (e.g., patterns and characteristics of interactions and relationships present in a classroom, which reciprocally influence one another; e.g., Rubin et al., 2006; Boor et al., 2016). These levels of analysis are described as intertwined, which means that they are interdependent and should be viewed as a complex system. Additionally, literature describes that, simultaneously, not only children need SES (e.g., communication skills), to engage in positive peer relationships and interactions, but also interactions among peers themselves, also provide a fundamental context for the development of SES (e.g., Denham et al., 2012; Rivers et al., 2013).

Regarding the role of SEL in fostering classroom peer relationships, there is an assumption that SEL can function as means for children to acquire peer conflict resolution strategies, thus reducing impulsive behaviors (e.g., Bierman et al., 2016). Which implies that SEL can have an important role on reducing well-known issues that greatly interfere with school dynamics, social climate and effectiveness, namely aggressiveness and violent behavior, as impulsive behavior is a key aspect at the base of these disruptive behaviors. More broadly, research has also shown the negative impact of the lack of

adequate peer relationships, underlining that peer relationship difficulties in childhood are predictors of future psychological maladjustment (Rivers et al., 2013; Sakyi et al., 2014; Shin et al., 2016). As SEL universal intervention in schools has been proven to foster improvements in children's perception of warmth and connectedness with their peers, supporting the potential of SEL for enhancing classroom climate and promoting positive learning and development environments (Rivers et al., 2013), we can safely consider that SEL based intervention benefits not only present-day school contexts, but also student's mental health and well-being going forward. The relevance and validity of supporting a wider implementation of SEL based intervention programs in school contexts has been continuously reinforced, as research keeps providing evidence of its effectiveness in terms of improving schools' social climate and students' mental health and well-being, as well as reducing the incidence of behavioral problems, namely violence. Over the years, studies have shown that school based SEL programs contribute to maintain stable, emotional, and supportive relationships, to promote significant changes in antisocial behavior, to a relevant increase in pro-social attitudes, as well as a decrease of students' aggressive behaviors (e.g., Cooke et al., 2007; Zins et al., 2007; Durlak et al., 2011).

1.4. Study goals

Despite the increased investment of both practitioners and researchers in developing, implementing, and evaluating school-based SEL programs in the past years, the effectiveness of such programs remains unclear, particularly in Portugal, where few quasi-experimental studies have been conducted within this field (e.g., Raimundo et al., 2013; Voith et al., 2020). Considering this, the present study aims to analyze the effects of the school-based universal intervention program "Calmly – Learning to Learn Yourself" [Calmamente—Aprendendo a Aprender-se] on child SES, namely self-regulation and communication skills, as well as on peer classroom relationships.

Overall, self-regulation and communication are critical outcomes of SEL interventions once these can provide children with the tools they need to navigate the social and emotional challenges they face in and out of school. Moreover, literature has shown that peer classroom relationships are pivotal to promote a positive and inclusive classroom environment, improve academic outcomes, and develop essential social and collaborative skills that children need to succeed in school and across their lives. Regarding the self-regulation skills, the study focuses on two specific sub-dimensions, namely self-control and emotional control. Concerning communication skills, the study focuses on assertiveness, cooperation, and sociability specific subdimensions. Furthermore, and considering that research provides ample evidence that children participating in SEL-based programs tend to develop important skills for peer interaction, this study also explores potential effects of the SEL-based intervention program ("Calmly - Learning to Learn Yourself") on children's perception of their peer classroom relationships. More specifically, we aim to analyze if the program has positive effects on key variables of peer relationships, namely (i) the child level of comfort in peer relations in the classroom; (ii) the levels of cooperation and conflicts between peers in the classroom; (iii) the levels of mutual affection between peers in the classroom; and (iv) the levels of classroom group cohesion and isolation. Moreover, the study analyzes the effects of the program separately the whole group of elementary school, aged children participating, as well as for third and fourth grade students.

Building on previous research showing that SEL universal intervention can have a positive effect in several SES and classroom social climate variables, the following hypothesis were formulated: (i) the intervention program "Calmly - Learning to Learn Yourself" will lead to a statistically significant improvement in children's self-regulation skills, specifically in the sub-dimensions of self-control and emotional control for third and fourth grade students, when comparing to children not attending the program; (ii) the intervention program "Calmly - Learning to Learn Yourself" will lead to a statistically significant improvement in children's communication skills, specifically in the sub-dimensions of assertiveness, cooperation, and sociability, both for third and fourth grade students, when comparing to children not attending the program; (iii) children who participate in the intervention program "Calmly - Learning to Learn Yourself" will report a statistically significant increase in their level of comfort in peer relations, level of cooperation and group cohesion in the classroom, and levels of mutual affection between peers in the classroom, both for third and fourth grade students, when comparing to children not attending the program; (iv) children who participate in the intervention program "Calmly – Learning to Learn Yourself" will report statistically significant lower levels of conflicts between peers in the classroom and a decrease in isolation in classrooms, for third and fourth grade students, when comparing to children not attending the intervention program.

2. Methods

This study uses a quasi-experimental design, with a pre- and post-assessment and an intervention period of 16 weeks. An intervention group (IG) and a comparison group (CG) were included, with schools randomly assigned to each group. A multi-informant approach was employed, using self- and hetero-report measures.

2.1. Participants

The current study included 12 classrooms across three elementary schools in the North region of Portugal. Of these, six were third-grade classrooms and six were fourth-grade classrooms. Schools were randomly assigned to the IG (two schools, eight classrooms) and to the CG (one school, four classrooms). All lead teachers responsible for participating classrooms ($N = 12$) were included in the study, namely eight teachers in the IG and four teachers in the CG. Overall, the teachers were all female, with a mean age of 47 years ($M = 47.18$, $SD = 8.2$). The average number of years teaching was 23.36 years ($SD = 8.64$). All teachers had a higher education degree, with 16.7% teachers holding a master's degree.

This study included 212 students (115 male) aged between 8 and 10 years ($M = 8.69$, $SD = 0.61$). From these, 145 children (79 male) were allocated to the IG and 67 (36 male) to the CG. In the IG, 63 students attended the third grade and 82 attended the fourth grade. In the CG, 32 students were in the third grade and 35 in the fourth grade. Independent *t*-tests revealed that there were no significant differences between students in the CG and those in the IG with regard to their

age, $t(210) = 0.67$, $p = 0.45$. A chi-squared test for independence indicated that there were no significant differences between the CG and the IG in terms of gender, $\chi^2(1) = 0.01$, $p = 0.92$. Fathers from students in the IG were aged between 27 and 72 years ($M = 41.72$, $SD = 6.86$); the mothers' ages ranged between 26 and 52 years ($M = 40.23$, $SD = 5.41$). In the CG, the fathers' ages varied between 32 and 52 years ($M = 41.37$, $SD = 4.28$), and the mothers were aged between 30 and 53 years ($M = 39.98$, $SD = 4.81$).

2.2. Measures

The measures included both self-report questionnaires, completed by students, and hetero-report questionnaires, completed by teachers and families. All measures were completed before (pre-test) and after (post-test) the implementation of the intervention program.

2.2.1. Study on social and emotional skills

The Study on Social and Emotional Skills (SSES; OECD, 2019) aims to assess the social and emotional skills of children. It is organized into six dimensions, namely self-regulation, communication, adaptability, creative thinking, resilience, and problem-solving. The SSES has one version for children, one version for families, and one version for teachers. All items are rated on a Likert scale ranging from 1 to 5 points (1—totally/completely disagree; 5—totally/completely agree). In this study, two of the six dimensions were used, namely self-regulation and communication. The self-regulation dimension includes 16 items organized into two subdimensions: self-control and emotional control. The communication dimension includes 24 items, organized into three subdimensions: assertiveness, cooperation, and sociability. In the present study, adequate values for internal consistency were found, with Cronbach's alpha for all dimensions and subdimensions ranging between 0.66 and 0.83 for the child's version, between 0.83 and 0.92 for the family's version, and between 0.71 and 0.92 for the teacher's version. For pos-test data, Cronbach's alpha ranged between 0.84 and 0.87 for all dimensions and subdimensions of the child's version; between 0.80 and 0.93 for the family's version of the measure; and between 0.68 and 0.94 for the teacher's version of the measures.

2.2.2. Classroom peer context questionnaire

The Classroom Peer Context Questionnaire (CPCQ; Boor et al., 2016) measures the children's perceptions of peer relationships in the class at the individual, interaction, group, and relationship levels (Fava, 2018; Hogekamp Fernandes, 2020). It includes 20 items, organized into six dimensions: Comfort in the classroom (individual level), Cooperation in the classroom (interaction level), Conflict in the classroom (interaction level), Mutual affection (relationship level), Cohesion of the class (group level), and Isolation (group level). Each dimension is composed of four items, except for Conflict (three items) and Mutual affection (one item). Items are rated on a 5-point Likert scale, from 1 (completely false) to 5 (completely true).

The CPCQ has shown good psychometric properties in its original study (e.g., Boor et al., 2016), as well as in previous studies conducted in Portugal (Fava, 2018). Internal consistency was analyzed in the present study through Cronbach's alpha. Acceptable internal consistency values were found for all dimensions, except for Comfort. More specifically, Cohesion had a Cronbach's alpha of 0.79 at pre-test and 0.78 at post-test; Conflict had a Cronbach's alpha of 0.71 at pre-test and 0.67 at post-test; Comfort had a Cronbach's alpha of 0.53 at pre-test and 0.71 at post-test; Isolation had a Cronbach's alpha of 0.65 at pre-test and 0.64 at post-test; and Cooperation had a Cronbach's alpha of 0.78 at pre-test and 0.83 at post-test. Considering the low internal consistency of the Comfort dimension at pre-test, the data on this dimension at this moment should be interpreted with caution.

2.2.3. Sociodemographic questionnaires

Two sociodemographic questionnaires were developed. The student and family version of the sociodemographic questionnaire captures students' and families' sociodemographic characteristics (e.g., child gender, birth date, nationality, number of school retentions, the number of siblings, parents' level of education, and employment status). The teacher version of the sociodemographic questionnaire was developed to gather sociodemographic data and information on the professional experience of the teachers, such as gender, age, marital status, number of years teaching, training completed, and employment status.

2.3. Procedures

Data collection followed all the ethical procedures according to APA standards. One school cluster was selected by convenience among the network of the researchers. The study was presented to the school director in a brief meeting. After getting the school cluster director approval for the study, a meeting was conducted with all elementary school teachers to present the project, study goals, and explain the randomization process. All teachers agreed to participate. Then, parents received a flyer presenting the study, as well as an informed consent form. A participation rate in the study of 79.4% of children in the study was achieved. Overall, written informed consent was obtained from the school director, teachers, and families. Data were collected at two time points—pre-test (December 2020) and post-test (June 2021)—for all participants in the IG and the CG. In accordance with ethical guidelines, participants in the CG had the opportunity to participate in a brief version of the intervention delivered to the IG after post test data collection.

Students completed the questionnaires in their school classroom in the presence of the researchers. The questionnaires for the families were sent in sealed envelopes, and families were asked to return them to their child's teachers, also in sealed envelopes. Teachers completed the questionnaires individually. The same procedures were used both in pre- and post-test data collection, both to IG and CG. The intervention with the program "Calmly – Learning to Learn Yourself" [Calmamente–Aprendendo a Aprender-se] started in January 2021, after pre-test data collection, and lasted for 16 weeks. All students in the classroom participated in the intervention, as this was infused into the curricula, although not all students were included in the study due to lack of parental consent to be part of the study. The intervention was monitored through self-report measures completed by the facilitator, external observations, and regular supervision sessions. Pre- and post-test assessments were conducted by external researchers, with independent teams responsible for the external evaluation and for the intervention process. This procedure aimed to decrease the biases in

the assessment procedures, particularly when completing the questionnaire with elementary school students.

2.4. Intervention: calmly—learning to learn yourself [calmamente—aprendendo a aprender-se]

"Calmly – Learning to Learn Yourself" [Calmamente—Aprendendo a Aprender-se] is a SEL-inspired universal program aiming to promote SES, with a mindfulness and growth mindset component. It is a classroom-based program infused into the school curriculum and aimed at facilitating the harmonious development of social and emotional skills, namely self-knowledge, adaptability, emotional regulation, communication, resilience, and problem-solving, among children and young people. It is supported by a set of dynamic teaching materials (e.g., card decks, personal notebook, and the "mini-calm cloud" ("mini-calma")] designed to facilitate and enrich the intervention. Each session proposes the development of one or more socio-emotional competencies. The program is organized into 10 themes, such as Share, Breathe, and (being) Among Others, and it invites students to go a journey with several stops along the way, whenever a new theme emerges. Several strategies, such as posters, reflection/brainstorming, open questioning, modeling, social and self-reinforcing feedback, and group games, are used in the program sessions. Skills and concepts are typically presented through various challenges in each session.

The program is structured as a set of weekly dynamic sessions and was specifically developed to be implemented in school contexts. It is expected to be implemented throughout the entire school year. In the present study, 16 developmentally appropriate sessions of 60-min each, delivered weekly by a trained facilitator in the presence of elementary school teachers responsible for each classroom, were implemented. The program was organized in 16 sessions in order to ensure a weekly presence in the classrooms across the school days calendar between January and May, as well as to fit the schools availability for the curricula infusion. Under this program, the facilitator is expected to work in collaboration with the teachers, encouraging them to promote the generalization of the skills developed in the program during the week by expanding activities and reminding children to use the strategies learned during the day (e.g., doing breathing exercises when they feel anxious or replicating with their families the activities carried out in the sessions). The program facilitator follows the session plans available in the program manual. For each session, the manual provides information about the SEL objectives, the strategies to be implemented, and the materials to be used.

2.4.1. Training, supervision, and monitoring

To implement the program "Calmly – Learning to Learn Yourself" [Calmamente—Aprendendo a Aprender-se], facilitators need to undergo certified training. The training program designed for the facilitators implementing the program with elementary school children within the scope of the "Gulbenkian Academies for Knowledge" encompasses 50 h, including both theoretical and practical sessions, with role-playing activities to train specific intervention competencies. The training was delivered by the program's author. Throughout the whole intervention period, weekly supervision sessions lasting approximately 60 min were held individually with each facilitator to ensure program fidelity. Besides supervision sessions, facilitators also completed a questionnaire after each intervention session with the children in each classroom, making it possible to document the fidelity of the intervention, the dosage, and the children's and teachers' responsivity, and the implementation quality. The responsivity of the children, parents, and teachers was also captured through child, teacher, and parent satisfaction questionnaires, completed at the end of the intervention.

Regarding program dosage, the 16 sessions of the program designed were implemented, with four sessions being implemented online due to the COVID-19 pandemic. Adaptation of activities to the online format was designed in collaboration between the program facilitators and the program's author. On average, children received 93% of sessions.

Implementation fidelity was self-reported by the facilitator of the intervention, for each session in each classroom. On a rating scale of five points, the facilitator registered the extent to which the session plan was accomplished according to the manual instructions and goals (1—not at all; 5—completely). Data from the face-to-face sessions ($n = 12$) revealed that on average, the sessions plans were almost completely accomplished ($M = 4.63$, $SD = 0.21$). Responsiveness was, on average good. For this indicator, the facilitator scored students engagement, level of positive affect and levels of satisfaction with each session. An average of the scores of the three items scored was computed for each session. Mean values were 4.60 ($SD = 0.21$), meaning that, in a five-point scale, facilitators perceive high level of students' responsiveness to the intervention throughout the sessions. Levels of satisfaction were also collected (in a five-point scale), at the end of intervention. Satisfaction questionnaires were completed by students, parents, and teachers. Results showed that students were very satisfied with the program, with average satisfaction levels of 4.41 ($SD = 0.67$), in a maximum of 5. Parents satisfaction levels were in a medium-high level, with an average score of 4.10 ($SD = 0.50$). Teachers reported an average satisfaction with the program of 4.29 ($SD = 0.48$), with lower levels of satisfaction regarding the adequacy of the program length ($M = 3.13$, $SD = 1.36$), and with the program ability to engage parents ($M = 2.88$, $SD = 0.60$). Teachers' maximum levels of satisfaction—completely satisfied—were registered regarding the interest and adequacy of the activities of the program for children. Finally, the quality of each session was also self-reported by facilitators. Items included in this dimension focused on structural quality indicators such as: the adequacy of the materials provided; the physical condition of the session space; the adequacy of the session duration; and process quality indicators such as the quality of facilitator-students relationships and quality of peer relations during each session. Each item was coded in a five-point scale, with values closer to 5 indicating a more positive quality. Overall, the facilitator reported a quality of structural aspects of the intervention on a 4.48 average level ($SD = 0.25$), and an average value of process implementation quality of 4.32 ($SD = 0.27$).

2.5. Data analyses

Data were analyzed using IBM SPSS version 28. Student's *t*-test for independent samples was used to compare the mean values obtained by the groups in the pre-test and the post-test. Effect sizes were

estimated and interpreted using Cohen's d ($d > 0.2$ small effect, $d > 0.5$ moderate effect and $d > 0.8$ large effect, Cohen, 1988). Repeated measures analyses of covariance (ANCOVAs) were used to explore interactions between pre-post gains and group conditions. All dependent variables were successively introduced in the repeated measures factor (Within—Subject Factor), with two levels (pre- and post-test), while the group variable (experimental vs. comparison) was introduced in the independent factor (Between—Subject Factor), and child gender, as well as the mothers' and fathers' level of education were introduced as covariates. Effect sizes were estimated and interpreted using partial eta squared ($\eta^2 > 0.01$ small effect, $\eta^2 > 0.06$ moderate effect and $\eta^2 > 0.14$ large effect, Cohen, 1988).

3. Results

Average values obtained by the IG and the CG in the pre-test were compared using the Student's t test for independent samples for all variables in the study. The results revealed the absence of statistically significant differences in all variables related to classroom peer relationships for the overall sample and separately for third and fourth graders; and in almost all variables related to SES included in the study, except for communication (reported by teachers) both for the overall sample and for fourth-graders, with CG presenting significantly higher levels of communication when compared with the IG, at pre-test, $t(208) = -1.576$, $p < 0.001$ and $t(115) = -1.139$ $p = 0.002$, respectively; and for sociability (reported by teachers) for third-graders, $t(91) = -1{,}599$, $p = 0.001$, also with the CG group presenting significantly higher levels of sociability according to teachers´ report.

Considering the absence of statistically significant differences between the IG and the CG at the pre-test for almost all variables, main effects of time and interactive effects of time with the group condition were examined and are presented below for variables related to SES (e.g., communication and self-regulation and its subdimensions) and variables classroom peer relationship variables (e.g., conflict and cooperation).

3.1. Effects of the intervention on children's self-regulation and communication

Gain differences in all the SES are summarized in Table 1 for the total group of participants, and separately for third- and fourth-grade students in Tables 2, 3, respectively. For the overall participants, comparisons between the groups were computed for post-test data to examine main effects of group. Main effects of time were examined by analyzing intragroup growth (Table 1). Over time, there was a statistically significant increase in children's emotional control and children sociability, reported by teachers, for the IG. For the CG, there was a significant decrease, over time, of assertiveness (reported by parents) and communication (reported by parents); and an increase in sociability, reported by teachers. This last result on sociability seems to be similar both for IG and CG. Interactive effects of time with group condition were examined. No main or interactive effects were found for self-regulation, self-control, emotional control, communication, sociability, and cooperation, as reported by students, families, and teachers. Only for assertiveness, as reported by families, an interactive effect of time and group condition was found, $F(1,180) = 3.747$, $p = 0.05$, $\eta^2 = 0.020$, with the IG showing greater gains in this dimension, compared to the CG. This indicates a positive effect of the intervention in students' assertiveness. Nevertheless, a small effect size was found.

Data were examined separately for third- and fourth-grade students. For third-grade students (Table 3), a statistically significant interactive effect of time with group condition was found, supporting the hypothesis that the IG group would benefit from the intervention in terms of assertiveness $F(1,81) = 6.448$, $p = 0.01$, $\eta^2 = 0.074$ (child report,); and sociability, $F(1,81) = 5.60$, $p = 0.02$, $\eta^2 = 0.07$ (teacher report). Effects sizes were small to moderate. No effects were found on self-regulation, self-control, and emotional control, for either of the informants' reports. For fourth-grade students (Table 4), a positive interactive effect of time and the group condition was found on self-regulation, $F(1,105) = 3.878$, $p = 0.05$, $\eta^2 = 0.036$ (child report); and emotional control, $F(1,109) = 5.836$, $p = 0.02$, $\eta^2 = 0.047$ (teacher report); Effects favoring the CG were found on sociability, $F(1,109) = 7.827$, $p = 0.006$, $\eta^2 = 0.067$ (teacher report). This provides partial support of the positive effect of the intervention for fourth-grade students SES, although effects sizes were small to moderate.

3.2. Effects on classrooms peer relationships

Building on the absence of statistically significant differences between the IG and the CG at the pre-test, comparisons between the groups were computed for post-test data to examine main effects of group. Overall, results showed statistically significant differences between the groups at the post-test for levels of comfort, conflicts, mutual affection, and isolation. More specifically, the CG showed higher levels of comfort and mutual affection at the post-test, when compared to the IG, $t(204) = -1.98$, $p = 0.049$ and $t(199) = -2.07$, $p = 0.039$, respectively. The IG presented lower levels of conflicts and isolation at post-test, when compared to the CG, $t(204) = -2.12$, $p = 0.032$ and $t(199) = -2.07$, $p = 0.039$, respectively.

Moreover, the main effects of time were examined (Table 4). For the IG, over time, there was a statistically significant decrease in children's perception of comfort in the classroom, $t(139) = -2.850$, $p = 0.005$, $d = 0.77$. For the CG a statistically significant increase in level of mutual affection, $t(63) = -2.683$, $p = 0.009$, $d = 1.34$, from pre- to post-test. Furthermore, to understand if changes at post-test were due to the participation in the SEL intervention, six individual repeated measures ANCOVAs were conducted, exploring interactive effects of time with condition (IG or CG) for the overall group pf participants. A statistically significant interactive effect of time with group condition, supporting the hypothesis that the IG would present a more positive change in the variables, emerged for the following dimensions: level of conflicts, $F(1, 191) = 5.045$, $p = 0.02$, $\eta^2 = 0.026$, and cooperation, $F(1, 191) = 4.643$, $p = 0.003$, $\eta^2 = 0.024$. A statistically significant interactive effect of time with group condition, favoring the CG, was found on the levels of mutual affection, $F(1, 202) = 7.103$, $p = 0.0008$, $\eta^2 = 0.037$. No effects were found for the dimensions of comfort, isolation, and cohesion (Table 4).

Data were examined separately for third- and fourth-grade students. No effects were found on the variable regarding classroom peer relations (Table 5) for third-grade students. For fourth-grade students (Table 6), a statistically significant interactive effect of time

TABLE 1 Means, standard deviations, and *t*-test for paired samples, repeated measures ANOVA and magnitude of effect for socioemotional skills: whole sample.

	Intervention group				Comparison group					
	Pre-test	Post-test			Pre-test	Post-test				
Child version	M(SD)	M(SD)	*t*	*d*	M(SD)	M(SD)	*t*	*d*	*F*	η^2
Self-regulation	4.47(0.67)	3.45(0.65)	0.294	0.60	3.63(0.69)	3.60(0.71)	0.455	0.65	0.219	0.001
Emotional control	3.21(0.77)	3.25(0.68)	−0.708	0.70	3.36(0.74)	3.40(0.77)	−0.497	0.67	0.067	—
Self-control	3.73(0.73)	3.67(0.77)	1.105	0.72	3.92(0.78)	3.80(0.79)	1.080	0.83	0.277	0.001
Communication	3.53(0.41)	3.50(0.49)	0.687	0.47	3.61(0.48)	3.55 (0.43)	0.879	0.48	0.161	0.001
Assertiveness	2.33(0.87)	2.40(0.93)	−1.007	0.80	2.32(0.97)	2.25(0.96)	0.600	0.96	0.646	0.003
Cooperation	4.15(0.62)	4.14(0.63)	0.180	0.65	4.33(0.72)	4.29(0.62)	0.388	0.78	0.223	0.001
Sociability	4.11(0.55)	3.97(0.67)	2.335*	0.70	4.18(0.68)	4.13(0.69)	0.485	0.65	0.562	0.003
Family version										
Self-regulation	3.34(0.66)	3.33(0.61)	0.342	0.46	3.38(0.65)	3.41(0.60)	−0.440	0.50	0.450	0.002
Emotional control	3.29(0.78)	3.26(0.72)	0.720	0.54	3.31(0.71)	3.35(0.68)	−0.475	0.53	0.686	0.004
Self-control	3.93(0.67)	3.40 (0.63)	−0.196	0.49	3.46(0.70)	3.49(0.65)	−0.365	0.57	0.137	0.001
Communication	3.75(0.41)	3.75(0.42)	0.187	0.32	3.86(0.40)	3.79(0.38)	1.683^{+}	0.29	1.307	—
Assertiveness	3.03(0.79)	3.08(0.82)	−0.759	0.72	3.07(0.83)	2.90(0.84)	2.034*	0.60	3.747*	0.020
Cooperation	4.24(0.43)	4.20(0.41)	1.305	0.33	4.34(0.43)	4.30(0.43)	0.723	0.36	0.033	—
Sociability	3.98(0.61)	3.96(0.55)	0.488	0.41	4.16(0.56)	4.17(0.54)	−0.207	0.37	0.299	0.002
Teacher version										
Self-regulation	3.71(0.88)	3.75(0.83)	−0.872	0.59	3.63(0.87)	3.65(0.91)	−0.354	0.44	0.160	0.001
Emotional control	2.56(0.44)	2.69(0.43)	−2.133**	0.49	2.78(0.54)	2.81(0.46)	−0.569	0.44	2.054	0.010
Self-control	3.64(0.96)	3.73(0.86)	−1.626	0.70	3.49(0.89)	3.58(0.95)	−1.299	0.57	0.080	—
Communication	3.47(0.61)	3.47(0.52)	−0.174	0.39	3.60(0.41)	3.58(0.46)	0.793	0.25	0.418	0.002
Assertiveness	2.53(1.20)	2.51(1.32)	0.466	0.66	2.59(1.02)	2.45(1.06)	1.615	0.70	1.213	0.006
Cooperation	3.92(0.74)	3.88(0.69)	0.740	0.62	4.03(0.66)	4.01(0.72)	0.353	0.47	0.002	—
Sociability	3.94(0.72)	4.04(0.61)	−2.199*	0.55	4.20(064)	4.29(0.67)	−1.845^{+}	0.41	0.015	—

*$p < 0.05$; **$p < 0.01$; ***$p < 0.001$; $^{+}p < 0.09$. [a]Child gender, maternal education, and paternal education were entered as covariates.

and the group condition was found on conflict, $F(1, 105) = 7.013$, $p = 0.009$, $\eta^2 = 0.063$, with a significant advantage for the IG that sees levels of conflicts decreasing over time, while CG sees levels of conflict increasing. Also, an interactive effect, favoring the IG, is documented on levels of isolation, with CG having an increase of isolation levels, while the IG maintain the initial isolation levels, $F(1, 105) = 5.248$, $p = 0.024$, $\eta^2 = 0.048$; in cooperation, $F(1, 105) = 9.886$, $p = 0.002$, $\eta^2 = 0.086$, with the IG showing significant gains, while the CG decreases level of cooperation over time; and in levels of cohesion, $F(1, 105) = 4.286$, $p = 0.016$, $\eta^2 = 0.037$, with the IG increasing their levels of cohesion, while the CG decreases in this variable (Table 6). An interactive effect of time and group condition, favoring the CG, was encountered on mutual affection. No effects were found on levels of comfort (Table 6).

4. Discussion

This study used a quasi-experimental design to analyze the effects of a universal SEL intervention, delivered as part of the school curriculum, on elementary school students' self-regulation, communication and classroom peer relationships, within a multi-informant approach. Although results revealed some inconsistency across informants and dimensions, some support for positive effects of the intervention on students´ competencies is provided. Overall, students who participated in this SEL program improved in dimensions of SES, such as self-regulation and communication, as well as in dimensions of classroom peer relationships, such as peer conflicts and peer cooperation, when compared with children who did not participate. For the overall sample, assertiveness, as reported by families, emerged as the competence in which students participating in the intervention showed more gains, compared to students not participating in the intervention. Moreover, based on children's reports, there was a positive effect of the program on classroom peer conflicts and cooperation in the classroom, with students participating in the program reporting a significant decrease in levels of conflicts in classroom, and higher levels of cooperation, when compared to students who did not participate in the intervention. As mentioned, results from this study are mixed, with positive effects of the intervention found for some dimensions, but not consistently across informants and dimensions. The same pattern, i.e., mixed results are also reported in the literature regarding the effects of universal SEL

TABLE 2 Means, standard deviations, and *t*-test for paired samples, repeated measures ANOVA and magnitude of effect for socioemotional skills: third graders (*n*=91).

	Intervention group				Comparison group					
	Pre-test	Post-test			Pre-test	Post-test				
Child version	M(SD)	M (SD)	*t*	*d*	M(SD)	M (SD)	*t*	*d*	*F*	η^2
Self-regulation	3.54(0.68)	3.44(0.74)	1.134	0.66	3.71(0.81)	3.77(0.72)	−0.344	0.84	0.129	0.002
Emotional control	3.76(0.78)	3.64(0.83)	1.170	0.82	3.99(0.88)	4.04(0.79)	−0.205	1.03	0.080	0.001
Self-control	3.30(0.74)	3.25(0.79)	0.626	0.73	3.43(0.85)	3.50(0.77)	−0.475	0.85	0.103	0.001
Communication	3.54(0.43)	3.53(0.57)	0.132	0.51	3.63(0.52)	3.66(0.38)	−0.287	0.57	0.229	0.003
Assertiveness	2.25(1.01)	2.60(1.07)	−3.043*	0.90	2.54(1.06)	2.42(1.02)	0.630	1.03	6.448**	0.074
Cooperation	4.20(0.67)	4.10(0.70)	1.061	0.75	4.25(0.83)	4.36(0.69)	−0.702	0.93	0.391	0.005
Sociability	4.16(0.49)	3.89(0.74)	2.658*	0.79	4.13(0.74)	4.20(0.64)	−0.528	0.74	2.178	0.032
Family version										
Self-regulation	3.38(0.53)	3.36(0.57)	0.274	0.42	3.46(0.62)	3.39(0.70)	0.850	0.43	0.461	0.006
Emotional control	3.45(0.55)	3.42(0.59)	0.443	0.47	3.58(0.72)	3.51(0.66)	0.804	0.47	0.219	0.003
Self-control	3.30(0.66)	3.30(0.66)	−0.031	0.56	3.34(0.69)	3.27(0.86)	0.644	0.51	0.480	0.007
Communication	3.68(0.44)	3.76(0.48)	−1.594	0.36	3.89(0.42)	3.83(0.41)	1.009	0.26	3.120^{+}	0.041
Assertiveness	2.99(0.82)	3.12(0.88)	−1.375	0.75	3.00(0.93)	2.86(0.90)	1.220	0.53	2.860^{+}	0.032
Cooperation	4.17(0.44)	4.17(0.44)	−0.023	0.36	4.48(0.41)	4.39(0.47)	1.471	0.30	5.853*	0.074
Sociability	3.89(0.63)	3.98(0.59)	−1.655^{+}	0.44	4.17(0.53)	4.25(0.49)	−1.145	0.31	0.213	0.003
Teacher version										
Self-regulation	3.64(0.91)	3.70(0.90)	−1.863^{+}	0.64	3.40(0.73)	3.45(0.77)	−0.578	0.51	1.279	0.015
Emotional control	3.57(0.91)	3.76(0.91)	−2.079*	0.70	3.32(0.75)	3.51(0.75)	−1.730^{+}	0.60	0.525	0.006
Self-control	2.61(0.44)	2.62(0.38)	−0.141	0.45	2.92(0.60)	3.00(0.41)	−0.815	0.52	0.350	0.004
Communication	3.41(0.53)	3.43(0.36)	−0.374	0.43	3.55(0.38)	3.49(0.43)	1.136	0.28	1.471	0.018
Assertiveness	2.34(1.13)	2.21(1.06)	1.492	0.69	2.73(1.08)	2.64(1.01)	0.557	0.82	0.211	0.003
Cooperation	3.96(0.73)	3.96(0.72)	0.000	0.52	3.84(0.70)	3.81(0.65)	0.350	0.52	0.917	0.011
Sociability	3.87(0.80)	4.11(0.62)	−2.880*	0.66	4.10(0.51)	4.05(0.58)	0.599	0.46	6.132**	0.070

*$p<0.05$; **$p<0.01$; ***$p<0.001$; $^{+}p<0.09$. [a]Child gender, maternal education, and paternal education were entered as covariates.

intervention programs on students, with small to moderate effect sizes being described (Carroll et al., 2020; Merrin and Low, 2023). For instance, and similarly to our study, Raimundo et al. (2013) found, in their quasi-experimental exploratory study with elementary school students, significant gains in SES, including peer relations and social competence. Nevertheless, other studies (e.g., Kim et al., 2015) found no effects of intervention in elementary school students' engagement behaviors after a SEL intervention. The literature documents the potential of SEL universal interventions to support all students of a given school or grade to enhance intra and interpersonal competences (e.g., Greenberg et al., 2003), albeit some students identified at risk or with social and emotional problems could benefit from additional targeted support. Moreover, the diversity of students based on personal and contextual characteristics can influence the participation and benefit of universal intervention (Cipriano et al., 2023). Thus, it is expected heterogeneous results due to students do not benefit equally from universal interventions (Merrin and Low, 2023). This can reinforce the need for continuous systems of support to students, which universal intervention can be complemented by delivering targeted interventions that fit students' specific needs (Cipriano et al., 2023).

Additionally, for the group of students participating in the intervention, our results also show a decrease for some of the outcomes the intervention aimed to improve. Although this was not expected according to our hypotheses. One possible explanation for this may be related to fact that after a SEL intervention students report lower levels of SES competences which can be due to gains in the awareness of what are SES and what are the indicators of positive SES. By improving children emotional literacy and self-awareness, students may get more demand both regarding their own SES as well as regarding the assessment of their classroom peer relationships quality. Thus, it would be important that future studies could further explore these explanations, by using a qualitative approach to understand student's experiences during SEL interventions, as well as individual meanings and criteria during self-assessments.

Recent literature underlines the need of research to consider the study of differential gains for children participating in SEL interventions, exploring how these programs affect the development of different groups of children. Most studies are exploring subgroups based on the participants socio-demographic characteristics (e.g., gender and socioeconomic level) which can be considered narrow (Simmons et al., 2018) based on the complexity of schools settings and

TABLE 3 Means, standard deviations, and *t*-test for paired samples, repeated measures ANOVA and magnitude of effect for socioemotional skills: fourth graders (*n*=133).

	Intervention group				Comparison group					
	Pre-test	Post-test			Pre-test	Post-test				
Child version	M(SD)	M(SD)	*t*	*d*	M(SD)	M(SD)	*t*	*d*	*F*	η^2
Self-regulation	3.42(0.67)	3.47(0.59)	−0.775	0.55	3.57(0.57)	3.46(0.68)	1.571	0.43	3.878*	0.036
Emotional control	3.71(0.70)	3.69(0.73)	0.344	0.64	3.85(0.69)	3.60(0.74)	2.461*	0.58	1.860	0.017
Self-control	3.14(0.78)	3.25(0.58)	−1.600	0.66	3.30(0.63)	3.31(0.76)	−0.167	0.48	3.575$^+$	0.033
Communication	3.52(0.40)	3.48(0.42)	0.841	0.44	3.59(0.46)	3.47(0.46)	1.935$^+$	0.38	0.933	0.009
Assertiveness	2.39(0.75)	2.24(0.77)	2.053*	0.65	2.13(0.87)	2.10(0.90)	0.199	0.91	1.195	0.011
Cooperation	4.11(0.58)	4.17(0.57)	−0.952	0.57	4.40(0.60)	4.22(0.55)	1.726$^+$	0.59	4.892*	0.045
Sociability	4.07(0.59)	4.03(0.61)	0.559	0.62	4.22(0.63)	4.09(0.74)	1.438	0.56	1.044	0.010
Family version										
Self-regulation	3.31(0.75)	3.30(0.65)	0.219	0.49	3.34(0.67)	3.44(0.53)	−1.085	0.54	1.488	0.014
Emotional control	3.35(0.74)	3.38(0.66)	−0.602	0.52	3.38(0.69)	3.48(0.65)	−0.926	0.62	2.574	0.025
Self-control	3.28(0.86)	3.21(0.76)	1.008	0.53	3.29(0.74)	3.39(0.53)	−1.096	0.55	0.442	0.004
Communication	3.81(0.38)	3.74(0.37)	2.229*	0.26	3.84(0.39)	3.77(0.37)	1.332	0.31	0.072	0.001
Assertiveness	3.06(0.77)	3.04(0.78)	0.263	0.69	3.12(0.79)	2.93(0.81)	1.612	0.65	0.032	---
Cooperation	4.29(0.41)	4.23(0.39)	1.933*	0.30	4.25(0.42)	4.25(0.39)	−0.069	0.40	1.200	0.012
Sociability	4.05(0.59)	3.95(0.53)	2.427*	0.37	4.15(0.58)	4.12(0.58)	0.476	0.40	0.452	0.004
Teacher version										
Self-regulation	3.76(0.87)	3.73(0.79)	0.656	0.54	3.83(0.94)	3.82(1.00)	0.145	0.39	0.214	0.002
Emotional control	3.68(1.00)	3.71(0.82)	−0.366	0.70	3.64(0.98)	3.65(1.10)	−0.103	0.55	5.386*	0.047
Self-control	2.52(0.44)	2.75(0.46)	−3.931*	0.51	2.67(0.46)	2.66(0.45)	0.162	0.35	0.000	---
Communication	3.51(0.67)	3.51(0.62)	0.128	0.37	3.65(0.44)	3.66(0.48)	−0.070	0.23	0.036	---
Assertiveness	2.67(1.24)	2.72(1.14)	−0.760	0.63	2.48(0.98)	2.29(1.09)	1.892$^+$	0.60	3.534$^+$	0.031
Cooperation	3.89(0.76)	3.82(0.67)	0.883	0.69	4.20(0.58)	4.19(0.75)	0.133	0.42	0.262	0.002
Sociability	3.99(0.66)	3.99(0.61)	0.086	0.43	4.29(0.74)	4.51(0.69)	−3.894*	0.33	7.827**	0.067

*$p<0.05$; **$p<0.01$; ***$p<0.001$; $^+p<0.06$. [a]Child gender, maternal education, and paternal education were entered as covariates.

TABLE 4 Means, standard deviations, and *t*-test for paired samples, repeated measures ANCOVA and magnitude of effect for classroom peer relationships variables for the whole sample (*N*=185).

	Intervention group				Comparison group					
	Pre-test	Pos-test			Pre-test	Pos-test				
	M(SD)	*M(SD)*	*t*	*d*	*M(SD)*	*M(SD)*	*t*	*d*	*F*[a]	*η2*
Comfort	4.56(0.47)	4.37(0.76)	2.850**	0.77	4.57(0.61)	4.58(0.53)	−0.168	0.62	1.040	0.005
Cooperation	3.73(0.92)	3.87(0.93)	−1.514	1.01	3.94(0.95)	3.79(0.79)	1.425	0.85	4.643*	0.024
Conflict	2.99(1.07)	2.82(0.94)	1.825$^+$	1.10	2.91(1.04)	3.09(0.90)	−1.504	0.98	5.045	0.026
Mutual affection	2.51(1.27)	2.33(1.24)	1.226	1.60	2.26(1.19)	2.72(1.09)	−2.683**	1.34	7.103*	0.037
Cohesion	3.76(0.93)	3.70(0.93)	0.658	1.02	3.81(1.04)	3.67(0.86)	1.376	0.91	0.911	0.05
Isolation	2.34(0.96)	2.44(0.88)	−1.085	1.06	2.38(0.91)	2.61(0.86)	−1.949$^+$	0.93	0.753	0.004

*$p<0.05$; **$p<0.01$; ***$p<0.001$. [a]Child gender, maternal education, and paternal education were entered as covariates.

in context developmental processes (Osher et al., 2020). In this scope, and having in consideration that children in third and fourth grades face different academic and socioemotional challenges, the effects of the program were analyzed separately for third and fourth grade students. Academically, third-grade students are usually in a stage where their literacy competencies are being consolidated, with communication and social interaction skills associated with the development of language and literacy competences being simultaneously challenged and potentiated. As for the fourth-grade students, this is the last year of elementary school and so the emotional challenges associated with the transition to the next level of education (fifth grade) is underlined in this period. The last year of elementary

TABLE 5 Means, standard deviations, and *t*-test for paired samples, repeated measures ANCOVA and magnitude of effect for classroom peer relationships variables for third graders (n=91).

	Intervention group				Comparison group					
	Pre-test	Pos-test			Pre-test	Pos-test				
	M(SD)	*M(SD)*	*t*	*d*	*M(SD)*	*M(SD)*	*t*	*d*	F^a	η^2
Comfort	4.45(0.54)	4.20(0.79)	2.280*	0.86	4.41(0.62)	4.20(0.79)	−1.90$^+$	0.66	7.451**	0.084
Cooperation	3.63(0.92)	3.66(1.01)	−0.231	0.92	3.59(0.97)	3.66(1.01)	−0.46	0.86	0.004	---
Conflict	3.21(1.04)	3.18(0.93)	0.181	1.06	3.21(1.03)	3.19(0.93)	−0.11	1.07	0.011	0.003
Mutual affection	2.77(1.33)	2.72(1.24)	0.245	1.58	2.80(1.35)	2.75(1.26)	−1.93$^+$	1.64	3.705$^+$	0.044
Cohesion	3.69(0.98)	3.45(0.93)	1.99*	0.93	3.65(1.02)	3.45(0.93)	−0.30	1.92	1.049	0.013
Isolation	2.47(1.02)	2.70(0.92)	−1.780$^+$	1.03	2.48(1.01)	2.71(0.92)	0.25	0.97	0.962	0.012

*$p<0.05$; **$p<0.01$; ***$p<0.001$; $^+p<0.06$. [a]Child gender, maternal education, and paternal education were entered as covariates.

TABLE 6 Means. standard deviations, and *t*-test for paired samples.

	Intervention group				Comparison group					
	Pre-test	Pos-test			Pre-test	Pos-test				
	M(SD)	*M(SD)*	*t*	*d*	*M(SD)*	*M(SD)*	*t*	*d*	F^a	η^2
Comfort	4.65(0.40)	4.51(0.71)	1.728	0.70	4.73(0.39)	4.55(0.44)	1.977$^+$	0.52	1.294	0.012
Cooperation	3.81(0.91)	4.02(0.82)	−1.722	1.08	4.21(0.71)	3.86(0.66)	2.549*	0.80	9.886**	0.086
Conflict	2.82(1.07)	2.53(0.85)	2.225*	1.13	2.68(0.98)	3.00(0.65)	−2.143*	0.89	7.013**	0.063
Mutual affection	2.30(1.19)	2.04(1.17)	1.402	1.64	2.12(1.07)	2.47(0.87)	−1.938$^+$	1.00	4.095*	0.039
Cohesion	3.81(0.88)	3.89(0.88)	−0.665	1.08	4.09(0.61)	3.75(0.73)	2.637*	0.76	6.039*	0.054
Isolation	2.24(0.89)	2.23(0.80)	0.079	1.07	2.15(0.86)	2.63(0.84)	−3.269*	0.83	5.248*	0.048

Repeated measures ANCOVA and magnitude of effect for classroom peer relationships for fourth graders (n = 113). *$p<0.05$; **$p<0.01$; ***$p<0.001$; $^+p<0.06$. [a]Child gender, maternal education, and paternal education were entered as covariates.

school is key for the development of regulatory skills—both emotional and behavior regulation. Thus, the effectiveness of the intervention program was examined separately for third and fourth grade students. A statistically significant positive effect of the program was found on third-grade students' assertiveness (child report), and sociability, (teacher report), as well as on the following classroom peer relations dimensions: comfort in classroom and mutual affection. For fourth-grade students, findings showed a statistically significant positive effect of the intervention on self-regulation (child report), emotional control (teacher report), as well as on the following classroom peer relations dimension: level of conflicts in classroom and levels of mutual affection.

While the positive indicators of the SEL intervention program show potential for improving children's competencies and peer contexts in the classroom, there remains inconsistency among informants in reporting the effectiveness of the program. Therefore, additional research is necessary, particularly with regard to the implementation process, in order to better understand the potential of this specific intervention. It is important to identify the factors that may have contributed to the inconsistent results across informants, such as differences in perception or understanding of the intervention or the influence of other contextual factors. Further investigation about the implementation process can shed light on these factors, which in turn can inform the development of more effective interventions. Several authors have identified the difficulties in demonstrating SEL intervention results, arguing that the effectiveness of the SEL programs is closely linked with the quality of the intervention process (e.g., Durlak et al., 2011; Bierman and Motamedi, 2015; Taylor et al., 2017; Voith et al., 2020; Mahoney et al., 2021; Ștefan et al., 2022; Wigelsworth et al., 2022). In our study, we underline that several monitoring mechanisms were implemented with data showing positive indicators of fidelity and responsiveness, although the intervention process may be affected by the pandemic. Even though the intervention delivered in this study did not follow all recommended guidelines from international literature, i.e., the intervention was only delivered for one school year not including the entire school calendar and had to be adapted for online during the pandemic (Durlak et al., 2011), the program analyzed in this study seems to be promising, with some positive effects on several relevant students' competencies. Recognizing that SEL is a developmental and individually based process, it is expected that certain competences may be acquired easily while others may require more support and instruction (Ura et al., 2020), resulting in variance in competences level. Therefore, we hypothesize that the results of this study may have been affected by the intervention intensity, i.e., to improve some skills a more continuous intervention over time might be needed. Moreover, we recognize that the program implemented included a wide set of socioemotional skills and was not exclusively focused on self-regulation, communication and peer classroom relationships, which may also have affected its ability to produce changes in the outcome variables. Additionally, note that although four of the 16 intervention sessions were adapted to the online format, both regarding the strategies and goals for the sessions, these adaptations were consistent across intervention groups and closely supervised by the author of the

program, adjusting to the real-life needs. Despite the adjustment of the program to the pandemic may have affected the effectiveness of the intervention as several studies underline that SEL programs need to be implemented effectively, with high-quality, evidence-based instructions in order to improve children's SES and development (e.g., Durlak et al., 2011; Sklad et al., 2012; Kim et al., 2015; Wigelsworth et al., 2022), we also underline that this was crucial to adequately respond to schools, students and family's needs in a crises period. Nevertheless, future studies are needed to examine the potential positive effects of "Calmly - Learning to Learn Yourself" [Calmamente—Aprendendo a Aprender-se] SEL program on students' competences when delivered across all school year, in a full face-to-face format (as it was originally designed) and using larger samples, increasing both the number of classrooms and schools in each condition, and including different school systems (e.g., private and public, suburban and rural).

Research has also been stressing that SEL programs that are embedded in the school environment as a whole are more effective in promoting children's competencies, rather than just having curriculum based SEL interventions (e.g., Wigelsworth et al., 2022). For instance, Adi et al. (2007) found evidence favoring whole-school, multicomponent intervention programs, underlining the positive effects of such interventions when compared to solely curriculum based SEL intervention programs. The authors found that teacher training and professional development, as well as parenting support during SEL interventions had a particularly differential positive effect on children's mental health outcomes. Despite mixed evidence regarding the differential effectiveness of interventions based on their action level (e.g., Wigelsworth et al., 2022), with several limitations regarding the own definition and ability of the studies to capture the whole school processes, we underline that, in the present study, the intervention was infused into the third and fourth-grade students' curricula but implemented by an external professional. Even though teachers and parental involvement was preconized in the intervention rationale, these were not consistently planned and consistently supported through the intervention in order to enhance an integrated approach of SEL across key settings of students. As such, a true whole school embedded intervention was not delivered in this study and we hypothesize that this may have affected the intervention efficacy, along with the above mentioned constrains during intervention. Although the intervention delivered in this study is among the few SEL interventions, in Portugal, that are infused into the curricula, we also note that a long path is still to come for in-depth changes in the school environments and curricula organization to align with the CASEL recommendations for SEL universal interventions and daily practices in schools.

4.1. Study limitations

This study provides preliminary evidence for the potential effectiveness of the "Calmly - Learning to Learn Yourself" [Calmamente—Aprendendo a Aprender-se] SEL program, however results must be interpreted carefully and some limitations must be acknowledged. Therefore, caution must be exercised when interpreting the results, and they should not be overgeneralized to other contexts, with the need of further research to confirm and expand our findings, as well as to explore the effectiveness of the program with different populations and in different settings. Given the heterogeneity of intervention outcomes, future research should consider a person-centered approach for identifying personal and contextual variables related to program effectiveness and for tracking different patterns of changes. The number of participants was limited with an uneven number of children in IG and CG. Future studies are needed with larger samples and balanced groups in terms of the number of participants. Then the implementation of the program only lasted 16 sessions/weeks over the course of one school year; the intervention did not start at the beginning of the school year, had to be adapted to the online format during the COVID-19 pandemic, and was only delivered in one school cluster. Additionally, although the program rationale considered the need to foster the generalization of the competencies promoted through teacher's extension of the program's activities, no control over how teachers implemented this aspect of the program was documented. This lack of control is problematic as it may have resulted in inconsistent implementation of the strategies in daily activities. To address this issue, future iterations of the program could include specific guidance and training for teachers on how to promote the use of the strategies and how to monitor implementation of the program in daily activities. Future studies should monitor how teachers embedded the program strategies in their classes and in their interaction with children in order to analyze differential effects of the program based on such extension. Furthermore, results from self-report measures completed by children may be affected by their reading and comprehension levels. For instance, third graders showed some difficulties in reading some questionnaire items. Results from teachers' reports may also be interpreted carefully as both the IG and the CG school were part of the same school cluster and social desirability may have affected their responses. Although teacher ratings are generally considered as a valid method for documenting children's competencies, it is possible that teachers' knowledge of the experimental condition may have influenced results. It is recommended that future studies not only use a multiformat approach, as the one used on the present study, but also include observation measures of students in their natural environments to capture the effects of the interventions (Cooke et al., 2007). Including observational assessments could also contribute to overcome the measurement issues related to SES. Additionally, the measure used to assess students' SES—the SSES—is not validated for Portuguese children. Although showing good reliability, future studies are needed on this measure for Portuguese samples. Moreover, literature underlines that there is no standardized approach to measuring social and emotional skills (Merrell, 2010; Durlak et al., 2011), and so we must recognize that our measures may not captured such skills accurately, hindering the efforts to capture short term results of the interventions (Ura et al., 2020).

4.2. Conclusion

Theoretical and empirical evidence supports the assumption that SEL universal interventions are crucial in educational settings. Despite a growing interest in understanding and supporting SEL in schools, including in Portugal, the definition and scope of SEL interventions remain broad, with mixed evidence across studies. As the emphasis on the universal SEL approaches where all students and adults in schools are engaged in a coordinated learning process (Durlak et al., 2022) is

reinforced, the need for more evidence on the effects of infused SEL interventions into the school curricula also grows. The present study focused on a recently developed Portuguese SEL intervention for elementary school children, providing initial evidence of its impact on children's competencies and classroom climate-related variables. To our knowledge, this is among the first quasi-experimental studies conducted in Portugal to analyze the effects of a SEL program infused into the curriculum for elementary school-aged children. Although several challenges in the development of a coherent set of evidence were faced, and further research about the intervention features and implementation is required, the initial results show that the intervention contributes to some of children's socio-emotional competencies and school peer classroom climate variables. However, the inconsistency of the present study results needs to be acknowledged. The unexpected pandemic that emerged while the intervention was being delivered posed additional challenges to both the program's original design (face-to-face intervention) implementation and the study features, potentially affecting the intervention's effectiveness. Therefore, in-depth changes in school environments and curricula organization are still required to align with CASEL recommendations for SEL universal interventions and daily practices in schools.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Ethics statement

Ethical review and approval was not required for the study on human participants in accordance with the local legislation and institutional requirements. Written informed consent to participate in this study was provided by the participants' legal guardian/next of kin.

Author contributions

VC and CP contributed equally to the study design and manuscript. CP, VC, and FM made substantial contributions to the conception or design of the study, analysis, and interpretation of data. AE led the intervention team and is responsible for the conception of the intervention program. VC, HA, CP, MS, and FM made substantial contributions in drafting the paper and revising it critically. VC, CP, HA, FM, MS, and AE were involved in ensuring that questions related to the accuracy or integrity of any part of the work were appropriately investigated and resolved. All authors contributed to the article and approved the submitted version.

Funding

This work was supported by the Calouste Gulbenkian Foundation, particularly within the scope of the "Gulbenkian Academies for Knowledge" [Academias do Conhecimento] program and also by the Portuguese Foundation for Science and Technology (UIDB/00050/2020).

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Publisher's note

References

Adi, Y., Mcmillan, A. S., Kiloran, A., Stewart-brown, S., Medical, W., Stewart-brown, C. S., et al. (2007). Systematic review of the effectiveness of interventions to promote mental wellbeing in primary schools report 3: Universal approaches with focus on prevention of violence and bullying. London, UK: National Institute for Health and Clinical Excellence. 1–106.

Androutsou, D., and Anastasiou, A. (2014). The relationship between school climate and student performance in the classroom: an empirical study concerning the factors that modulate the school climate in primary education in Greece. *Int. J. Acad. Res. Bus. Soc. Sci.* 4, 253–267. doi: 10.6007/IJARBSS/v4-i1/526

Berg, J., Nolan, E., Yoder, N., Osher, D., and Mart, A. (2019). Social-emotional competencies in context: Using social-emotional learning frameworks to build educators' understanding. Available at: https://measuringsel.casel.org/wp-content/uploads/2019/02/Frameworks-C.2-.pdf

Bierman, K. L., Greenberg, M. T., and Abenavoli, R. (2016). Promoting social and emotional learning in preschool: Programs and practices that work. Edna Bennet Pierce Prevention Research Center, Pennsylvania State University.

Bierman, K. L., and Motamedi, M. (2015). "SEL programs for preschool children" in *Handbook on Social and Emotional Learning: Research and Practice*. eds. J. A. Durlak, C. E. Domitrovich, R. P. Weissberg and T. P. Gullotta (New York: Guilford), 135–150.

Blewitt, C., Morris, H., Jackson, K., Barrett, H., Bergmeier, H., O'Connor, A., et al. (2020). Integrating health and educational perspectives to promote preschoolers' social and emotional learning: development of a multi-faceted program using an intervention mapping approach. *Int. J. Environ. Res. Public Health* 17:24. doi: 10.3390/ijerph17020575

Boor, K. H. J., Segers, E., Hendrickx, M. M. H. G., and Cillessen, A. H. N. (2016). Development and psychometric properties of the classroom peer context Questionnaire. *Soc. Develop.* 25, 370–389. doi: 10.1111/sode.12137

Bowles, T., Jimerson, S., Haddock, A., Nolan, J., Jablonski, S., Czub, M., et al. (2017). A review of the provision of social and emotional learning in Australia, the United States, Poland, and Portugal. *J. Relation. Res* 8, 1–13. doi: 10.1017/jrr.2017.16

Bradshaw, C. P., Zmuda, J. H., Kellam, S. G., and Ialongo, N. S. (2009). Longitudinal impact of two universal preventive interventions in first grade on educational outcomes on high school. *J. Educ. Psychol.* 101, 926–937. doi: 10.1037/a0016586

Carlson, S. M., and Wang, T. S. (2007). Inhibitory control and emotion regulation in preschool children. *Cogn. Dev.* 22, 489–510. doi: 10.1016/j.cogdev.2007.08.002

Carroll, A., Houghton, S., Forrest, K., McCarthy, M., and Sanders-O'Connor, E. (2020). Who benefits most? Predicting the effectiveness of a social and emotional learning intervention according to children's emotional and behavioural difficulties. *Sch. Psychol. Int.* 41, 197–217. doi: 10.1177/0143034319898741

Cipriano, C., Naples, L. H., Eveleigh, A., Cook, A., Funaro, M., Cassidy, C., et al. (2023). A systematic review of student disability and race representation in universal school-based social and emotional learning interventions for elementary school students. *Rev. Educ. Res.* 93, 73–102. doi: 10.3102/00346543221094079

Coelho, V., Marchante, M., and Sousa, V. (2016). Positive attitude program's impact upon self-concept across childhood and adolescence. *Rev. Psicodid.* 21, 261–280. doi: 10.1387/RevPsicodidact.15129

Coelho, V., and Sousa, V. (2017). Comparing two low middle school social and emotional learning program formats: a multilevel effectiveness study. *J. Youth Adolesc.* 46, 656–667. doi: 10.1007/s10964-016-0472-8

Cohen, J. (1988). *Statistical Power Analysis for the Behavioral Sciences* (*2nd*). Hillsdale, NJ: Lawrence Erlbaum Associates, Publishers

Collaborative for Academic, Social, and Emotional Learning (CASEL) (2017). What is SE. Available at: http://www.casel.org/what-is.sel/

Collaborative for Academic, Social, and Emotional Learning (CASEL). (2021). Available at: http://www.casel.org/what-is.sel/

Cooke, M., Ford, J., Levine, J., Bourke, C., Newell, L., and Lapidus, G. (2007). The effects of city-wide implementation of "second step" on elementary school students' prosocial and aggressive behaviors. *J. Prim. Prev.* 28, 93–115. doi: 10.1007/s10935-007-0080-1

Cristóvão, A. M., Candeias, A. A., and Verdasca, J. (2017). Social and emotional learning and academic achievement in Portuguese schools: a bibliometric study. *Front. Psychol.* 8:1913. doi: 10.3389/fpsyg.2017.01913

Denham, S. A. (2018). Keeping SEL developmental: The importance of a developmental lens for fostering and assessing SEL competencies. Measuring SEL: Using Data to Inspire Practice. Available at: http://pv-inc.net/wp-content/uploads/2021/08/Frameworks-DevSEL.pdf

Denham, S. A., Bassett, H. H., Thayer, S. K., Mincic, M. S., Sirotkin, Y. S., and Zinsser, K. (2012). Observing preschoolers' social-emotional behavior: structure, foundations, and prediction of early school success. *J. Genet. Psychol.* 173, 246–278. doi: 10.1080/00221325.2011.597457

Djamnezhad, D., Koltcheva, N., Dizdarevic, A., Mujezinovic, A., Peixoto, C., Coelho, V., et al. (2021). Social and emotional learning in preschool settings: a systematic map of systematic reviews. *Front. Educ.* 6:691670. doi: 10.3389/feduc.2021.691670

Domitrovich, C. E., Bradshaw, C. P., Greenberg, M. T., Embry, D., Poduska, J. M., and Ialongo, N. S. (2010). Integrated models of school-based prevention: logic and theory. *Psychol. Sch.* 47, 71–88. doi: 10.1002/pits.20452

Domitrovich, C. E., Durlak, J. A., Staley, K. C., and Weissberg, R. P. (2017). Social-emotional competence: an essential factor for promoting positive adjustment and reducing risk in school children. *Child Dev.* 88, 408–416. doi: 10.1111/cdev.12739

Durlak, J. A., and DuPre, E. P. (2008). Implementation matters: a review of res earch on the influence of implementation on program outcomes and the factors affecting implementation. *Am. J. Community Psychol.* 41, 327–350. doi: 10.1007/s10464-008-9165-0

Durlak, J. A. (Ed.). (2015). *Handbook of social and emotional learning: Research and practice*. Guilford Publications.

Durlak, J. A., Mahoney, J. L., and Boyle, A. E. (2022). What we know, and what we need to find out about universal, school-based social and emotional learning programs for children and adolescents: a review of meta-analyses and directions for future research. *Psychol. Bull.* 148, 765–782. doi: 10.1037/bul0000383

Durlak, J. A., Weissberg, R. P., Dymnicki, A. B., Taylor, R. D., and Schellinger, K. B. (2011). The impact of enhancing students' social and emotional learning: a meta-analysis of school-based universal interventions. *Child Dev.* 82, 405–432. doi: 10.1111/j.1467-8624.2010.01564.x

Eisenberg, N., Cumberland, A., Spinrad, T. L., Fabes, R. A., Shepard, S. A., Reiser, M., et al. (2001). The relations of regulation and emotionality to children's externalizing and internalizing problem behavior. *Child Dev.* 72, 1112–1134. doi: 10.1111/1467-8624.00337

Embry, D., and Biglan, A. (2008). Evidence-based kernels: fundamental units of behavioral influence. *Clin. Child. Fam. Psychol. Rev.* 11, 75–113. doi: 10.1007/s10567-008-0036-x

Fava, J. (2018). Interacções sociais de alunos com necessidades educativas especiais [social interactions of students with special education needs] (unpublished master dissertation). Escola Superior de Educação e Comunicação, Universidade do Algarve.

FitzPatrick, S., Twohig, M., and Morgan, M. (2014). Priorities for primary education? From subjects to life-skills and children's social and emotional development. *Irish Educ. Stud.* 33, 269–286. doi: 10.1080/03323315.2014.923183

Greenberg, M., Domitrovich, C., Weissberg, R., and Durlak, J. (2017). Social and emotional learning as a public health approach to education. *Futur. Child.* 27, 13–32. doi: 10.1353/foc.2017.0001

Greenberg, M. T., Weissberg, R. P., O'Brien, M. U., Zins, J. E., Fredericks, L., Resnik, H., et al. (2003). Enhancing school-based prevention and youth development through coordinated social, emotional, and academic learning. *Am. Psychol.* 58, 466–474. doi: 10.1037/0003-066X.58.6-7.466

Heberle, A. E., Thomann, C. R. B., and Carter, A. S. (2020). "Social and emotional development theories," in *Encyclopedia of Infant and Early Childhood Development*. ed. J. B. Benson, vol. *3. 2nd* ed (Oxford: Elsevier), 173–182.

Hogekamp Fernandes, I. (2020). Práticas de ensino e aprendizagem socioemocional [socio emotional teaching practices] (unpublished master dissertation). Instituto Superior de Educação e Ciências, Lisboa.

Hughes, C., and Ensor, R. (2011). Individual differences in growth in executive function across the transition to school predict externalizing and internalizing behaviors and self-perceived academic success at 6 years of age. *J. Exp. Child Psychol.* 108, 663–676. doi: 10.1016/j.jecp.2010.06.005

Jennings, P. A., and Greenberg, M. T. (2009). The prosocial classroom: teacher social and emotional competence in relation to student and classroom outcomes. *Rev. Educ. Res.* 79, 491–525. doi: 10.3102/0034654308325693

Jones, S. M., and Bouffard, S. M. (2012). Social and emotional learning in schools: from programs to strategies. *Soc. Policy Rep.* 26, 1–33. doi: 10.1002/j.2379-3988.2012.tb00073.x

Jones, D. E., Greenberg, M., and Crowley, M. (2015). Early social-emotional functioning and public health: the relationship between kindergarten social competence and future wellness. *Am. J. Public Health* 105, 2283–2290. doi: 10.2105/AJPH.2015.302630

Kim, D., Hyun, J. H., Lee, J., Bertolani, J., Mortari, L., and Carey, J. (2015). Eccomi pronto: implementation of a socio-emotional development curriculum in a south Korean elementary school. *Int. J. Emot. Educ.* 7, 2–14.

Konold, T., Cornell, D., Jia, Y., and Malone, M. (2018). School climate, student engagement, and academic achievement: a latent variable, multilevel multi-informant examination. *AERA Open* 4, 233285841881566–233285841881517. doi: 10.1177/2332858418815661

Ladd, G. W. (2005). *Children's Peer Relations and Social Competence: A Century of Progress*. New Haven, Connecticut: Yale University Press

Luckner, A. E., and Pianta, R. C. (2011). Teacher-student interactions in fifth grade classrooms: relations with children's peer behavior. *J. Appl. Dev. Psychol.* 32, 257–266. doi: 10.1016/j.appdev.2011.02.010

Madill, R. A., Gest, S. D., and Rodkin, P. C. (2014). Students' perceptions of relatedness in the classroom: the roles of emotionally supportive teacher-child interactions, children's aggressive-disruptive behaviors, and peer social preference. *Sch. Psychol. Rev.* 43, 86–105. doi: 10.1080/02796015.2014.12087456

Mahoney, J. L., Weissberg, R. P., Greenberg, M. T., Dusenbury, L., Jagers, R. J., Niemi, K., et al. (2021). Systemic social and emotional learning: promoting educational success for all preschool to high school students. *Am. Psychol.* 76, 1128–1142. doi: 10.1037/amp0000701

Marchante, M., and Coelho, V. (2021). O programa de aprendizagem socioemocional – atitude positiva 3° ciclo nas academias Gulbenkian do conhecimento [the socio-emotional learning program – positive attitude 3rd cycle at the Gulbenkian academies for knowledge]. *Rev. INFAD Psicol.* 2, 461–470. doi: 10.17060/ijodaep.2021.n1.v2.2097

Maxwell, S., Reynolds, J., Lee, E., Subasic, E., and Bromhead, E. (2017). The impact of school climate and school identification on academic achievement: multilevel modeling with student and teacher data. *Front. Psychol.* 8:2069. doi: 10.3389/fpsyg.2017.02069

McClelland, M. M., Cameron, C. E., Connor, C. M., Farris, C. L., Jewkes, A. M., and Morrison, F. J. (2007). Links between behavioral regulation and preschoolers' literacy, vocabulary, and math skills. *Dev. Psychol.* 43, 947–959. doi: 10.1037/0012-1649.43.4.947

Merrell, K. W. (2010). Linking prevention science and social, and emotional learning: the Oregon resiliency project. *Psychol. Sch.* 4, 55–70. doi: 10.1002/pits

Merrin, G., and Low, S. (2023). Who Benefts from universal SEL programming?: assessment of second step© using a growth mixture modeling approach. *Sch. Ment. Heal.* 15, 177–189. doi: 10.1007/s12310-022-09542-1

Murray, K. T., and Kochanska, G. (2002). Effortful control: factor structure and relation to externalizing and internalizing behaviors. *J. Abnorm. Child Psychol.* 30, 503–514. doi: 10.1023/A:1019821031523

Nakano, T., Oliveira, A., and Moraes, I. (2019). Relação entre inteligência e competências socioemocionais em crianças e adolescentes [relationship between intelligence and socio-emotional skills in children and adolescentes]. *Rev. Psicolog.* 37, 407–424. doi: 10.18800/psico.201902.002

Oberle, E., Domitrovich, C. E., Meyers, D. C., and Weissberg, R. P. (2016). Establishing systemic social and emotional learning approaches in schools: a framework for schoolwide implementation. *Camb. J. Educ.* 46, 277–297. doi: 10.1080/0305764X.2015.1125450

OECD (2019). Study on social and emotional skills. Nonpublished assessment measure.

Olson, S. L., Sameroff, A. J., Kerr, D. C. R., Lopez, N., and Wellman, H. M. (2005). Developmental foundations of externalizing problems in young children: the role of effortful control. *Dev. Psychopathol.* 17, 25–45. doi: 10.1017/S0954579405050029

Osher, D., Cantor, P., Berg, J., Steyer, L., and Rose, T. (2020). Drivers of human development: how relationships and context shape learning and development1. *Appl. Dev. Sci.* 24, 6–36. doi: 10.1080/10888691.2017.1398650

Peixoto, C., and Coelho, V. (2022). "Country overviews: Portugal" in *Social and Emotional Development for Children aged 0 to 7 years old: European Countries Overviews Compendium. EU-SELF Project*. eds. N. Koltcheva and V. Coelho (Sofia: New Bulgarian University Press), 112–116.

Pinto, A., and Raimundo, R. (2016). "Socio-emotional learning framework: evolution and challenges" in *Evaluation and Promotion of Socioemotional Skills*. eds. A. Pinto and R. Raimundo (Lisboa: Coisas de Ler), 15–36.

Raimundo, R., Marques, P. A., and Lima, M. L. (2013). The effects of a social-emotional learning program on elementary school children: the role of pupils' characteristics. *Psychol. Sch.* 50, 165–180. doi: 10.1002/pits.21667

Ramsook, K. A., Welsh, J. A., and Bierman, K. L. (2020). What you say, and how you say it: Preschoolers' growth in vocabulary and communication skills differentially predict kindergarten academic achievement and self-regulation. *Soc. Dev.* 29, 783–800. doi: 10.1111/sode.12425

Rautakoski, P., Ursin, P., Carter, A. S., Kaljonen, A., Nylund, A., and Pihlaja, P. (2021). Communication skills predict social-emotional competencies. *J. Commun. Disord.* 93:106138. doi: 10.1016/j.jcomdis.2021.106138

Raver, C., Jones, S. M., Li-Grining, C., Zhai, F., Bub, K., and Pressler, E. (2011). CSRP's impact on low-income preschoolers' preacademic skills: self-regulation as a mediating mechanism. *Child Dev.* 82, 362–378. doi: 10.1111/j.1467-8624.2010.01561.x

Rivers, S., Brackett, M., Reyes, M., Elbertson, N., and Salovey, P. (2013). Improving the social and emotional climate of classrooms: a clustered randomized controlled trial testing the RULER approach. *Prev. Sci.* 14, 77–87. doi: 10.1007/s11121-012-0305-2

Rubin, K. H., Bukowski, W. M., and Parker, J. G. (2006). "Peer interactions, relationships, andgroups" in *Handbook of child psychology: Social, emotional,and personality development*. ed. N. Eisenberg. 6th edn. New York, NY: Wiley, 571–645.

Sakyi, K., Surkan, P., Fombonne, E., and Melchior, M. (2014). Childhood friendships and psychological difficulties in young adulthood: an 18year follow-up study. *Eur. Child Adolesc. Psychiatry* 24, 815–826. doi: 10.1007/s00787-014-0626-8

Sawyer, A. C. P., Miller-Lewis, L. R., Searle, A. K., Sawyer, M. G., and Lynch, J. W. (2015). Is greater improvement in early self-regulation associated with fewer behavioral problems later in childhood? *Dev. Psychol.* 51, 1740–1755. doi: 10.1037/a0039829

Shin, K., Sho, S. M., Shin, Y., and Park, K. (2016). Effects of early childhood peer relationships on adolescent mental health: a 6- to 8-year follow-up study in South Korea. *Psychiatry Investig.* 13, 383–388. doi: 10.4306/pi.2016.13.4.383

Simmons, D. N., Brackett, M. A., and Adler, N. (2018). Applying an equity lens to social, emotional, and academic development, (June), 1–13. Available at: https://www.rwjf.org/en/insights/our-research/2018/06/applying-an-equity-lens-to-social-emotional-and-academic-development.html

Sklad, M., Diekstra, R., Ritter, M. D., Ben, J., and Gravesteijn, C. (2012). Effectiveness of school-based universal social, emotional, and behavioral programs: do they enhance students' development in the area of skill, behavior, and adjustment? *Psychol. Sch.* 49, 892–909. doi: 10.1002/pits.21641

St Clair, M. C., Forrest, C. L., Yew, G. K., and Gibson, J. L. (2019). Early risk factors and emotional difficulties in children at risk of developmental language disorder: a population cohort study. *J. Speech Lang. Hear. Res.* 62, 2750–2771. doi: 10.1044/2018_JSLHR-L-18-0061

Ştefan, C. A., Dănilă, I., and Cristescu, D. (2022). Classroom-wide school interventions for preschoolers' social-emotional learning: a systematic review of evidence-based programs. *Educ. Psychol. Rev.* 34, 2971–3010. doi: 10.1007/s10648-022-09680

Taxonomy Project (n.d.). *Navigate the complex field of social and emotional learning*. Available at: http://exploresel.gse.harvard.edu

Taylor, R. D., Oberle, E., Durlak, J. A., and Weissberg, R. P. (2017). Promoting positive youth development through school-based social and emotional learning interventions: a meta-analysis of follow-up effects. *Child Dev.* 88, 1156–1171. doi: 10.1111/cdev.12864

Thapa, A., Cohen, J., Guffey, S., and Higgins-D'Alessandro, A. (2013). A review of school climate research. *Rev. Educ. Res.* 83, 357–385. doi: 10.3102/0034654313483907

Ura, S. K., Castro-Olivo, S. M., and d'Abreu, A. (2020). Outcome measurement of school-based SEL intervention follow-up studies. *Assess. Eff. Interv.* 46, 76–81. doi: 10.1177/1534508419862619

Voith, L. A., Yoon, S., Topitzes, J., and Brondino, M. J. (2020). A feasibility study of a school-based social emotional learning program: informing program development and evaluation. *Child Adolesc. Soc. Work J.* 37, 329–342. doi: 10.1007/s10560-019-00634-7

Weare, K., and Nind, M. (2011). Mental health promotion and problem prevention in schools: what does the evidence say? *Health Promot. Int.* 26, i29–i69. doi: 10.1093/heapro/dar075

Weissberg, R. P., Durlak, J. A., Domitrovich, C. E., and Gullotta, T. P. (2015). "Social and emotional learning: past, present, and future" in *Handbook on Social and Emotional Learning: Research and Practice*. eds. J. A. Durlak, C. E. Domitrovich, R. P. Weissberg and T. P. Gullotta (New York: Guilford), 3–19.

Weissberg, R. P., and Elias, M. J. (1993). Enhancing young people's social competence and health behavior: an important challenge for educators, scientists, policymakers, and funders. *Appl. Prev. Psychol.* 2, 179–190. doi: 10.1016/S0962-1849(05)80088-5

Wigelsworth, M., Verity, L., Mason, C., Qualter, P., and Humphrey, N. (2022). Social and emotional learning in primary schools: a review of the current state of evidence. *Br. J. Educ. Psychol.* 92, 898–924. doi: 10.1111/bjep.124

Williford, A. P., Whittaker, J. E., Vitiello, V. E., and Downer, J. T. (2013). Children's engagement within the preschool classroom and their development of self-regulation. *Early Educ. Dev.* 24, 162–187. doi: 10.1080/10409289.2011.628270

Zeidner, M., Roberts, R. D., and Matthews, G. (2002). Can emotional intelligence be schooled? *Educ. Psychol.* 37, 215–231. doi: 10.1207/S15326985EP3704

Zins, J. E., Bloodworth, M. R., Weissberg, R. P., and Walberg, H. J. (2007). The Scientific Base linking social and emotional learning to school success. *J. Educ. Psychol. Consult.* 17, 191–210. doi: 10.1080/10474410701413145

frontiers | Frontiers in Psychology

TYPE Original Research
PUBLISHED 17 May 2023
DOI 10.3389/fpsyg.2023.1172517

OPEN ACCESS

EDITED BY
Pedro Rosário,
University of Minho, Portugal

REVIEWED BY
Brianna Devlin,
University of Oregon, United States
Margrét Sigmarsdóttir,
University of Iceland, Iceland

*CORRESPONDENCE
Vítor Alexandre Coelho
✉ vitorpcoelho@gmail.com

RECEIVED 23 February 2023
ACCEPTED 26 April 2023
PUBLISHED 17 May 2023

CITATION
Coelho VA, Marchante M and Brás P (2023) Positive Attitude Upper Middle School social and emotional learning program: influences of implementation quality on program outcome. *Front. Psychol.* 14:1172517. doi: 10.3389/fpsyg.2023.1172517

Positive Attitude Upper Middle School social and emotional learning program: influences of implementation quality on program outcome

Vítor Alexandre Coelho[1,2]*, Marta Marchante[1,2] and Patrícia Brás[2]

[1]Center for Research in Psychology for Positive Development, Lusíada University of Porto, Porto, Portugal, [2]Académico de Torres Vedras, Torres Vedras, Portugal

Introduction: There is an increased call for studies analyzing how implementation quality influences Social and Emotional Learning (SEL) program effectiveness.

Methods: The current dissemination study analyzed the effectiveness of the Positive Attitude Upper Middle School SEL program on a Portuguese nationwide sample composed of 813 middle school students (7th and 8th grade; 51.7% boys; M_{age}=12.41, *S.D.*=1.06), from 36 classrooms ($M_{classroom}$=22.58; *S.D.*=2.86), distributed between the control group (179 students), and three intervention groups (643 students) that reflected low, middle, and high implementer experience (respectively, Gulbenkian Academies of Knowledge, Positive Attitude Cadaval and Positive Attitude Torres Vedras). Dosage and fidelity (as implementation quality dimensions), gender, and classroom size (as individual and classroom-level variables) were also analyzed. Self-report questionnaires were administered pre- and post-intervention and at a 6-month follow-up.

Results: Multilevel models were employed, and results showed that participating in the PAUMS SEL program led to more positive trajectories in self-control, social awareness, relationship skills, and responsible decision-making when compared with control groups. Regarding implementation quality, only the implementer's experience impacted the effectiveness of the PAUMS SEL program; students in the Gulbenkian Academies of Knowledge intervention group displayed a less positive trajectory in self-control than students in the Positive Attitude Torres Vedras intervention group.

Discussion: Altogether, results showed that the PAUMS SEL program is ready for dissemination in Portugal, although a higher level of implementer experience is needed to achieve the best effectiveness, and they support the importance of analyzing implementer experience in SEL programs' effectiveness studies.

KEYWORDS

Social and emotional learning, differential effectiveness, national dissemination, implementation quality, fidelity

Introduction

The effectiveness of universal Social and Emotional Learning (SEL) programs has been well-established in several studies, including several meta-analyses (Durlak et al., 2011; Taylor et al., 2017; Sande et al., 2019). However, several authors reported substantial variability in the program's effectiveness (Wigelsworth et al., 2016; Coelho and Sousa, 2018; Domitrovich et al., 2019), whereas other authors concluded that some interventions were most effective with certain groups or under certain conditions (Sande et al., 2019; Carroll et al., 2020). Moreover, most SEL program effectiveness trials were conducted with elementary school students (Durlak et al., 2011; Taylor et al., 2017), with fewer studies focusing on adolescents and middle school students. Consequently, there has been increasing interest in studies focused on the differential effectiveness of SEL programs.

In the literature, strong evidence supports that program success is moderated by implementation quality (Durlak, 2016; Domitrovich et al., 2019), which can be defined as the way a program is put into practice and delivered to participants (Durlak, 2016). Evans et al. (2015) warned that sporadic and inconsistent implementation was a significant challenge for SEL interventions, whereas Domitrovich et al. (2019) suggested that the effectiveness of SEL programs depends on how well they are implemented, where implementation can be defined. However, there is still debate regarding which aspects of program implementation are more likely to influence SEL programs' effectiveness. Multiple studies of SEL programs concluded that implementation quality dimensions (e.g., the way a program is delivered, which involves staff training; the congruence between implementers' delivery style and the program; the adaptations made to the original program during implementation) moderate intervention effects (Durlak et al., 2011; Reyes et al., 2012; Domitrovich et al., 2019).

Another remaining issue in the literature is that a vast majority (87%) of effectiveness-based trials have been conducted in the United States of America (Elias, 2019). Therefore, the current study will assess how different aspects of implementation quality, such as fidelity, dosage, and the implementer's previous experience, influence the effectiveness of an SEL program (in this case, Positive Attitude Upper Middle School SEL program – PAUMS), using a nationwide dissemination of the PAUMS program.

Social and emotional learning

The Collaborative for Academic, Social, and Emotional Learning (CASEL) defines Social and Emotional Learning (SEL) as 'the process through which all young people and adults acquire and apply the knowledge, skills, and attitudes to develop healthy identities, manage emotions and achieve personal and collective goals, feel and show empathy for others, establish and maintain supportive relationships, and make responsible and caring decisions.' (Collaborative for Academic, Social, and Emotional Learning [CASEL], 2022). According to Collaborative for Academic, Social, and Emotional Learning [CASEL] (2022), SEL is focused on the development of five core competencies: self-awareness (i.e., to be able to recognize emotions, strengths, limitations, and values); self-management (i.e., to be able to regulate thoughts, emotions, and behaviors); social awareness (i.e., to be able to empathize with others and use perspective-taking); relationship skills (i.e., to be able to establish and maintain healthy relationships); and responsible decision-making (i.e., to be able to make healthy choices across varied situations).

Social and emotional learning programs

Several meta-analyses of SEL programs have provided robust evidence for the efficacy of SEL interventions (Durlak et al., 2011; Wigelsworth et al., 2016; Taylor et al., 2017). Consistent across all three studies was the finding that students who participated in SEL programs improved their social and emotional competencies, and their mental health problems were reduced compared to students who did not participate. Therefore, SEL programs were considered both feasible and effective in a variety of educational contexts worldwide (Elias, 2019). Moreover, they have also been associated with several positive behavioral and academic outcomes (Elias, 2019) namely, increased SEL skills, attitudes, prosocial behaviors, and academic achievement, as well as decreased conduct problems and emotional distress (Durlak et al., 2011).

However, another common feature in these three meta-analyses was that the SEL programs analyzed were mainly applied in elementary schools and, in Portugal, middle school (particularly upper middle school; i.e. 7th- 9th grade) is a period of upheavals and challenges for students' social and emotional competencies that are associated with a decrease in the positivity of school climate perceptions (Coelho et al., 2020). For example, official reports show sharp increases in school retention rates; which increase from 2.3% in elementary school and 4.2% in lower middle school to 6.6% in upper middle school (DGEEC; 2020). Therefore, there is an increasing demand to implement interventions with middle school students (Coelho et al., 2016).

The positive attitude upper middle school SEL program

The Positive Attitude project has implemented the PAUMS SEL program (7th to 9th grades) since 2004. In the last 3 years, it has been implemented in two Lisbon municipalities (Cadaval and Torres Vedras). The PAUMS SEL program was designed to enhance children's social and emotional competencies using the theoretical framework proposed by the Collaborative for Academic Social and Emotional Learning (CASEL) in 2005. So, the PAUMS SEL program is classroom-based (including all students in each class), delivered weekly by an educational psychologist (in the presence of the head teacher), and integrated into the school curriculum. The current version of the program is delivered in 13 one-hour weekly sessions (out of 27 potential planned sessions), according to each class profile. It follows a program manual, which contains detailed plans for each session. More information about the program can be found in Coelho and Figueira (2011) and Coelho et al. (2016).

The program's efficacy has been analyzed in several previous publications (Coelho et al., 2014, 2015a, 2017; Coelho and Sousa, 2017, 2018). Both self and teacher reports demonstrated that participation in the PAUMS SEL program positively impacted social and emotional competencies, especially social awareness and self-control (Coelho et al., 2015a, 2017; Coelho and Sousa, 2017). However, previous studies were conducted solely in the Lisbon district and, therefore, to increase the reliability of previous results a nationwide replication was needed. In the current study, a nationwide analysis of

the PAUMS SEL program effectiveness was conducted under the Gulbenkian Academies of Knowledge (GAK) initiative (more details in the procedure subsection).

Current issues with social and emotional learning programs

Although many SEL programs have strong empirical support (Taylor et al., 2017; Domitrovich et al., 2019), many scholars still disagree regarding which variables positively or negatively impact the effectiveness of SEL programs when they are widely disseminated (McClelland et al., 2017; Domitrovich et al., 2019). Optimal intervention effects require adequate implementation fidelity (Sørlie, 2021), and SEL literature has focused on how implementation quality potentially influences SEL programs' effectiveness (Durlak et al., 2011; Domitrovich et al., 2019). Particularly, Cross and West (2011) point out that there is a tension in the literature between those who advocate that new interventions should be implemented with maximum fidelity, or those who consider that adaptations should be permitted or encouraged to suit local needs and preferences. Given that a high level of fidelity (which is only possible under favorable circumstances) leads to more positive outcomes in SEL programs (Domitrovich et al., 2019), then a high level of fidelity in dissemination studies should be a priority. In addition, some authors focus their analysis on the needed amount of SEL programs dosage to achieve positive results (Tominey and McClelland, 2011; Reyes et al., 2012; McClelland et al., 2017), whereas other authors debate how experienced an SEL program implementer must be to produce the same results in a replication study than in the original effectiveness studies (Durlak and DuPre, 2008; Cooper et al., 2015).

Among individual and classroom level variables, gender and classroom size have been identified by several authors as influencing SEL programs' effectiveness (Van Schoiack-Edstrom et al., 2002; Holsen et al., 2008; Coelho et al., 2015a). Gender is likely the most analyzed individual variable when effectiveness studies are implemented (Taylor et al., 2017), whereas classroom size is a relevant variable in previous studies that analyzed PAUMS SEL program's effectiveness (Coelho and Sousa, 2018).

Therefore, for the current study, we consider how a set of individual and classroom variables may influence the effectiveness of the PAUMS SEL program. Namely, implementation quality variables, gender, and classroom size were analyzed in the nationwide dissemination of the program.

Implementation quality

According to several authors (Durlak, 2016; Dowling and Barry, 2020), implementation quality should be assessed by following the multi-dimensional framework of Dane and Schneider (1998). This framework is composed of five core dimensions: (1) fidelity, i.e., how many core components were delivered as prescribed; (2) dosage, i.e., how much of the original program has been delivered (number of sessions); (3) quality, which refers to how well the implementer delivers the program; (4) participant responsiveness, which refers to how participants respond to or are engaged with an intervention; (5) program differentiation, i.e., how unique the program characteristics (theory and practices) are compared with other programs. Due to the available data, the current study focuses on three of these five core components: fidelity, dosage, and one aspect of quality – specifically, implementer experience.

Fidelity

According to Sørlie (2021), fidelity assesses if the intervention is implemented in close accordance with how it was originally described and empirically tested, without major violations of goals, guidelines, and underlying theory. Implementation fidelity is recognized as an important feature in the successful delivery of SEL programs (Durlak et al., 2011; Wigelsworth et al., 2016), and it is strongly associated with positive outcomes (Durlak and DuPre, 2008). Fagan and Mihalic (2003) reported that a high level of fidelity is possible under favorable circumstances; specifically, when implementations problems are easily identified, and strategies are developed to overcome them SEL programs that are replicated with high levels of fidelity produce stronger impacts, but, when implemented poorly, they are not likely to impact student outcomes (Domitrovich et al., 2019). To measure implementation fidelity, it is important to consider a range of components (adherence, quality, exposure, and responsiveness) that can affect children's outcomes in different ways (McClelland et al., 2017). This highlights the importance of developing measures that accurately assess these components (McClelland et al., 2017).

Dosage

Dosage is the level of exposure to an intervention, and it is widely accepted as being highly influential (McClelland et al., 2017). Moreover, the dosage is one of the easiest measures of implementation quality to quantify; it is often operationalized as the number of lessons delivered or the amount of intervention exposure time (Domitrovich et al., 2008). However, relatively few studies have assessed the effectiveness according to intervention exposure (McClelland et al., 2017) and even fewer have sought to understand intervention impacts under different implementation dosages (Bradshaw et al., 2020). In one of these studies, Tominey and McClelland (2011) evaluated the Red Light, Purple Light program and concluded that children who attended at least 11 (of 15) sessions showed the strongest gains. Furthermore, Reyes et al. (2012) identified gains in emotional and social problem-solving skills when students received a sufficient dosage of interventions. Nevertheless, the question remains: how much dosage is enough to achieve optimal results?

Implementer's experience

Authors agree that among the components that influence program success we should include not only program's characteristics, but also implementers' characteristics, including previous program experience and their attitudes toward it (Durlak and DuPre, 2008; Cross and West, 2011; Cooper et al., 2015). According to Cross and West (2011), the competence of the implementers is critical for the effectivess of the programs, and it has implications on how it will be delivered. The key elements of implementers's experience are adherence and the competence of the implemeters (Cross and West, 2011). Regarding adherence, Cross and West (2011) and Durlak and DuPre (2008) concluded that implementers who recognize a specific need, believed in program success, and have higher levels of self-efficacy, are more likely to implement a program at higher levels of dosage or fidelity, is considered by Cross and West to be an element of implementation fidelity. On the other hand, implementers' competence is considered to be an element or of implementation quality (Cross and West, 2011;

Cooper et al., 2015), and Fixsen et al. (2009) predicted that the implementers' expertise will be different each time they start a program with a new group and that could take up to 4 years until an implementer achieve acceptable levels.

Gender

There is no consensus in the literature regarding the differential gender effects of participating in SEL programs. While some studies (Durlak et al., 2011; Ialongo et al., 2019) found no differential impact of gender from participating in universal SEL programs, several other studies (Van Schoiack-Edstrom et al., 2002; Holsen et al., 2008; Coelho et al., 2015a) report differential impacts by gender. In the Second Step program, in two different studies, 6th-grade girls benefitted in social competence from participation in the program (Van Schoiack-Edstrom et al., 2002; Holsen et al., 2008). Also, in Portugal, several studies conducted with the PAUMS SEL program reported that girls gained more social awareness after participation in the PAUMS SEL program than boys (Coelho et al., 2015a, 2017; Coelho and Sousa, 2018).

Classroom size

Classrooms are social settings where students are involuntary members and where they spend most of their time, interacting with other students, daily (Sentse et al., 2015). Furthermore, the classroom is the primary setting for most SEL programs; therefore, emotionally supportive, and well-organized classrooms can improve student-level outcomes (Jones et al., 2017). The results existing in the literature are inconsistent, while some reported that there is no differential impact of the SEL program according to class size (Coelho and Sousa, 2017), others report impacts in different SEL variables (Coelho and Sousa, 2018). Some studies have concluded that students from smaller classes were more supportive and caring of each other and they benefit more from an SEL program (Finn et al., 2003), or that they improve more in self-control when participating in an SEL program (Coelho and Sousa, 2018). However, the same study (Coelho and Sousa, 2018) also concluded that students from larger classes benefited more in social awareness from participating in the PAUMS SEL program.

Current study

Despite several meta-analyses supporting the effectiveness of school Social and Emotional Learning programs (Durlak et al., 2011; Taylor et al., 2017; Sande et al., 2019), several authors (Wigelsworth et al., 2016; Jones et al., 2017; Dowling and Barry, 2020) have argued that there is a lack of studies focusing upon differential effectiveness (i.e., what works, for whom it works, and under what conditions). Specifically, Dowling and Barry (2020) concluded that to accurately interpret the effectiveness of a program, it is necessary to understand how implementation quality varies, by answering questions on how much, how well, and which aspects of the program were delivered.

Therefore, the current study had two main aims: first, to analyze the effectiveness of the PAUMS SEL in a dissemination study that used a nationwide sample under the GAK; second, to analyze the role of several elements of implementation quality and establish how they may influence the effectiveness of the PAUMS SEL program in the aforementioned nationwide replication of the program. For the first aim, we formulated the following three hypotheses—the PAUMS SEL program is effective in a nationwide sample (H1). Also, given previous program results (Coelho et al., 2017; Coelho and Sousa, 2018), we also hypothesized that the benefits of the intervention will differ by gender, with girls benefiting more than boys (H2) and that student gains from participating in the PAUMS SEL program will differ according to classroom size (H3). To assess the second aim, we formulated three more hypotheses; the effectiveness of the PAUMS SEL program will be greater: if the fidelity implementation of the program is higher (H4); if the implementation dosage is closer to the number of sessions prescribed in the manual (H5); if the implementers' experience is higher (H6).

Method

Participants

The students who participated in this study were part of wave one (2019/2020 school year) of a nationwide dissemination initiative of the PAUMS SEL program. This initiative was part of the Gulbenkian Academies of Knowledge (GAK) program, which sponsored programs considered blueprints in Portugal. The sample was originally composed of 1,451 middle school (7th – 8th grade) students, who attended 15 Portuguese public middle schools, both in the continent (six different municipalities) and in the Madeira Archipelago. The sample followed national population estimates for each region; 362 (24.9%) students were from the North region (Vizela); 388 students (26.7%) from the Center region (in Pombal); 587 students (40.5%) from the Lisbon and Tagus Valey region (Lisbon and Setubal), 71 students (4.9%) from the Algarve (Faro and Loulé), and 43 students (3.0%) were from Archipelago of Madeira.

However, due to the lockdown implemented in Portugal due to the COVID-19 pandemic, it was not possible to finish the programs' implementation in 29 classes ($n = 638$). Furthermore, there were sources of attrition other than the COVID-19 pandemic. Although the program was implemented as a part of a mandatory school subject dedicated to citizenship, 12 parents opted out of the assessments in the classrooms assessed. Therefore, the final sample was composed of 813 middle school (7th–8th grade) students, from 36 classrooms ($M_{classsize} = 22.58$; $SD = 2.26$), 51.7% of which were boys ($n = 420$) and 47.9% girls ($n = 390$), the remaining (0.4%) classified themselves as "other" or opted not to answer. Participants' age ranged from 12 to 16, with a mean age of 12.41 ($SD = 1.06$). Regarding school grade distribution, 453 were 7th graders and 360 were 8th graders. Six-hundred-thirty-four students participated in the PAUMS SEL program Attitude (78%) and 179 were in the control group condition (22.0%). Regarding the modality of program implementation, 220 students (27.1%) participated in Positive Attitude Torres Vedras, 115 (14.1%) participated in Positive Attitude Cadaval, and 299 (36.8%) were part of the GAK group. Classrooms varied in size, with the total number of students per class ranging from 13 to 28. Schools displayed a wide range of socioeconomic, between 24.4 and 60.4% of students eligible to receive free or reduced school meals ($M_{Frsm} = 39.4\%$; $SD = 7.20\%$). However, most schools had a relatively low level of students ethnic from minority backgrounds, from 2 and 18% ($M = 0.06$; $SD = 0.06$). Further information about students is displayed in Table 1.

TABLE 1 Self-reports – descriptive statistics for social and emotional competencies across times, per gender and modality.

	Self-control			Social awareness			Relationship skills			Responsible decision making		
	Time 1 M (SD)	Time 2 M (SD)	Time 3 M (SD)	Time 1 M (SD)	Time 2 M (SD)	Time 3 M (SD)	Time 1 M (SD)	Time 2 M (SD)	Time 3 M (SD)	Time 1 M (SD)	Time 2 M (SD)	Time 3 M (SD)
Gender												
Boys	12.74 (3.42)	13.24 (3.29)	13.47 (3.20)	12.10 (4.06)	12.74 (4.07)	12.66 (3.71)	8.44 (3.94)	9.06 (3.88)	9.27 (3.37)	6.11 (2.28)	6.46 (2.19)	6.90 (1.96)
Girls	13.70 (3.20)	14.15 (3.08)	14.12 (2.92)	14.47 (4.08)	14.95 (3.98)	14.59 (3.73)	8.43 (3.70)	9.07 (3.85)	9.19 (3.46)	6.49 (2.13)	6.70 (2.11)	7.10 (1.87)
Condition												
Control group	13.66 (3.22)	13.30 (2.98)	13.09 (3.10)	13.98 (4.23)	13.44 (3.99)	13.22 (3.80)	8.28 (3.71)	8.19 (3.60)	8.21 (3.03)	6.52 (2.10)	6.23 (2.05)	6.56 (1.88)
Intervention group	13.07 (3.38)	13.80 (3.28)	14.00 (3.04)	13.02 (4.22)	13.94 (4.22)	13.73 (3.85)	8.48 (3.85)	9.32 (3.90)	9.53 (3.47)	6.23 (2.25)	6.68 (2.17)	7.13 (1.91)
Modality												
IG GAK	12.91 (3.44)	13.39 (3.48)	13.55 (3.20)	12.68 (4.22)	13.59 (4.35)	13.55 (3.83)	8.11 (3.95)	9.04 (4.16)	8.19 (3.49)	6.13 (2.39)	6.45 (2.29)	6.89 (1.98)
IG PA Cadaval	12.70 (3.55)	13.45 (3.29)	13.79 (2.82)	12.71 (4.18)	13.85 (4.44)	13.34 (3.86)	8.55 (3.56)	8.87 (3.94)	9.47 (3.48)	5.82 (2.21)	6.27 (2.17)	6.69 (1.85)
IG PA Torres Vedras	13.50 (3.18)	14.53 (2.88)	14.73 (2.84)	13.67 (4.17)	14.49 (3.88)	14.21 (3.82)	8.97 (3.84)	9.93 (3.50)	10.03 (3.40)	6.62 (2.04)	7.18 (1.93)	7.70 (1.74)

*$p < 0.05$; **$p < 0.01$; ***$p < 0.001$; GAK, Gulbenkian Academies of Knowledge; PA, Positive Attitude.

The criteria used to exclude students was not at the individual, but at the classroom level, thus students who were not assessed at every timepoint were kept in the sample; 810 (99.6%) students completed the first assessment, 806 (96.0%) completed the second assessment, and 766 (91.2%) completed the third assessment. Students who did not complete an assessment had either moved to another school or were absent from school on the days of the assessments and could not be reached during the following week.

Measures

Social and emotional competencies

The Social and Emotional Competences Evaluation Questionnaire (QACSE; Coelho et al., 2015b, Coelho and Sousa, 2020) was used. This self-report instrument is validated for adolescents (9 to 16 years) and is composed of 39 items presented as statements to be rated on a four-point scale (A–Never; B–Sometimes; C–Frequently, and D-Always). The Questionnaire assesses six dimensions, four of which are the social and emotional competencies that were assessed in the current study.

The self-control subscale assesses the ability to monitor and manage one's own emotions and behaviors and is composed of seven items (e.g., "I wait for my turn without getting anxious"; $\alpha = 0.73$, 0.80 in the present study). The social awareness subscale evaluates the ability to understand other people, empathy, compassion, and social norms, and it is also composed of seven items (e.g., "I get worried when someone has problems"; $\alpha = 0.87$, 0.85 in the present study). The relationship skills subscale assesses the capacity of initiating and maintaining positive interpersonal relationships, and the level of communication skills. It is composed of seven items (e.g., "Others choose me as a group responsible"; $\alpha = 0.71$, 0.73 in the present study). Finally, the responsible decision-making subscale measures the level of reflexive consideration when facing different choices, where the student must consider his and others' well-being. It is composed of four items (e.g., "When I take a bad decision, I come back and correct it"; $\alpha = 0.87$, 0.88 in the present study). The questionnaire's reliability, validity, and factor structure have been validated in three different studies (Coelho et al., 2015b, 2016; Coelho and Sousa, 2020).

Dosage and fidelity

Program implementation was monitored through an online platform. For each session, implementers had to report students' presences, i.e., the indicator used for dosage. Implementers also had to report which planned activities and reflections, were implemented per session, i.e., providing the indicators for fidelity. The online platform only released the contents for the next session after the implementers filled out that information, thus there was no missing data for dosage or fidelity.

Procedure

The Calouste Gulbenkian Foundation launched a national initiative named the Gulbenkian Academies of Knowledge (GAK), which aimed to develop social and emotional competencies in children and youth, by disseminating blueprint Portuguese interventions. The PAUMS SEL program was one of the blueprint

programs chosen for replication. After a two-stage selection process, six academies across Portugal were established in seven different municipalities: one in the North Region (Vizela), one in the Center Region (Pombal), two in the Lisbon and Tagus Valley region (Lisbon and Setúbal), one in Algarve (covering the Faro and Loulé municipalities) and another one in the Archipelago of Madeira (Caniçal).

To better support the GAK in the implementation of the PAUMS SEL program, the Positive Attitude team developed a package that included training, monitoring, and supervision, a standardized manual for PAUMS SEL program, and an online platform (Marchante and Coelho, 2021). The training consisted of 35 h (28 h in small groups and 7 h onsite). To monitor and supervise the replication of the PAUMS SEL program in the academies, the developers were on site for two full days throughout the implementation of the PAUMS SEL program. The online platform was created to allow the registration of student attendance and the implementation of fidelity. Furthermore, the online platform was also used to collect students' assessments.

The educational psychologists who implemented the program were present in the meetings in back-to-school meetings (mandatory for parents), to explain the program and answer questions. All schools used passive informed consent because the program was considered part of the school curriculum, following national legislation. School boards (not the implementers nor the Academies personnel) assigned classrooms to the intervention and control groups. Parents had the choice to withdraw their children from the assessments, and therefore the data for those students was not collected. The study was approved by the Psychology for Positive Development Research Center (*Lusíada* University – North) under the project CIPD/2122/DSE/2 and it was conducted following the national professional code of ethics for psychologists.

Self-reports were filled at baseline, posttest, and six-month follow-up, while demographic data were recorded at the pretest. In the intervention group, questionnaires were administered in the first and last sessions of the program, and control groups were assessed in the same period, but proceeded with business as usual and, therefore, did not receive any social and emotional learning training. All intervention groups implemented the same curriculum and test applications for both groups were carried out under the same conditions, with the psychologist responsible for each class reading questionnaire instructions out loud to the students and the students responding on an online platform either using a computer provided by the school or a tablet provided by the project, which resulted in no missing data at the individual level. If a student was not present during the evaluation the questionnaires were administered in another class within 1 week ($n = 49$).

Implementers' experience was organized into three groups: in PA Torres Vedras, all the implementers had more than 5 years of experience in implementing the PAUMS SEL program, so they possessed a high level of experience, furthermore they had direct access to the program developers. In PA Cadaval, both implementers had 2 years of experience, and they were considered as having a medium level of experience and had regular supervision weekly meetings with the program developers. In the third group, GAK, originally the implementers did not have experience in implementing the program but received training and two full-day supervision visits by the program developers.

Data analyses

Students from the same class have a much higher probability of providing highly correlated responses (Heck et al., 2013). So, given the hierarchical and clustered nature of the study dataset, we used hierarchical linear modeling in MLwiN 2.36. Originally, four-level models were used, the three measurements were nested within 813 students, which were nested within 36 classrooms, which were nested within 12 schools. However, due to the reduced levels of variance at the school level, the final models were three-level models. To test our first two research hypotheses, a series of models were created for each outcome (these are available in the Supplementary Tables S1–S4). First, an unconditional model (Model 0) with no predictors was run to analyze between-class variance. Time (linear and quadratic) was added next to assess within-individual variation. Next, gender was entered as an explanatory variable at the individual level. For model 3, classroom-level variables (FRSM, ethnicity, classroom size, and condition) were entered as co-variates and explanatory variables at the classroom level. FRSM, ethnicity, and classroom size were grand-mean centered, whereas the condition was dummy-coded (0 = Control Group, 1 = Intervention Group). Model 4 included a cross-level interaction term between Level 1 and Level 2 variables (Gender*Time Linear), whereas, in the final models a series of cross-level interactions terms were specified using dummy coding to test hypothesis one, these cross-level interactions included Condition*TimeLinear, Condition*TimeQuadratic, and Classroomsize*Time. To assess hypothesis two three-way cross-level interactions were created; Gend er*Condition*TimeLinear. To assess hypothesis three another three-way cross-level interactions were created; Classroomsize*Cond ition*TimeLinear.

To test research hypotheses four to six, the same steps were until the final models except that in Model 2 dosage was entered as a grand-mean centered individual variable, and in Model 3 fidelity was entered (grand-mean centered), whereas FRSM and ethnicity were removed. Additionally, in model 3 modality was entered instead of condition. Modality was dummy-coded (0 = PA Torres Vedras; 1 = PA Cadaval; 2 = Gulbenkian Academies of Knowledge), and all comparisons were made relative to the PA Torres Vedras group. In the final models, a series of cross-level interactions terms were specified using dummy coding including Dosage*TimeLinear, Fidelity*TimeLinear, Classroomsize*TimeLinear, Modality*TimeLinear, Modality*TimeQuadratic (for each of the modalities). These models are available in the Supplementary Tables S5–S8.

Results

Descriptive statistics

The descriptive statistics for the social and emotional competencies for every timepoint are displayed in Table 1. For all the variables, there was no significant variance at the school level in the null models (less than 1%). So, following Heck et al. (2013), we incorporated school-level variables (free and reduced school meals and ethnicity) into classroom-level variables. The values for the variances per level in the initial models are displayed in the Supplementary Tables.

Fidelity and dosage

Regarding implementation fidelity, the implementers reported a high degree of implementing the program as conceived. Although implementation fidelity varied from 70 to 100%, most classrooms reported a very high level of implementation fidelity; out of 28 classrooms, 16 (57.1%) reported 100% of implementation fidelity, and four reported 95%.

There was also little variation in dosage, 73.1% of the students reported having been present in 12 to 14 sessions, which means that most students were either present in all sessions or missed one session. Only 5% of the students attended 11 or fewer sessions and 21.4% took part in an implementation where several extra sessions were needed to deal with all the material in the lesson plans (from 15 to 18 sessions).

PAUMS SEL program effectiveness in a nationwide sample

The first aim of the current was to analyze the effectiveness of the PAUMS SEL program in a dissemination study that used a nationwide sample. Under that aim, the first hypothesis was formulated to assess program effectiveness while controlling for socioeconomic status (through free or reduced school meals), ethnicity, and classroom size. The results of these analyses are displayed in Table 2.

After adjusting for all individual and class-level variables, as well as cross-level interactions, linear time was a statistically significant predictor of social awareness and responsible decision-making, whereas quadratic time was a statistically significant predictor for responsible decision-making. After adjusting for all other variables, during the analyzed period, students displayed a statistically significant constant decrease in social awareness ($\beta = -0.83$, SE = 0.37; $z = -2.23$, $p = 0.026$) and a statistically significant decrease in responsible decision-making ($\beta = -0.67$, SE = 0.23; $z = -2.94$, $p = 0.003$) that also accelerated ($\beta = 0.30$, SE = 0.11; $z = 2.83$, $p = 0.005$). Gender was also a statistically significant predictor of self-control ($\beta = -1.01$, SE = 0.22; $z = -4.64$, $p < 0.001$), social awareness ($\beta = -2.41$, SE = 0.27; $z = -9.05$, $p < 0.001$), and responsible decision-making ($\beta = -0.38$, SE = 0.14; $z = -2.70$, $p = 0.007$), with girls displaying higher levels than boys in these three social and emotional competencies.

Regarding classroom level variables, students from schools where there was a higher percentage of students receiving free or reduced school meals reported statistically significantly lower scores in self-control ($\beta = -4.53$, SE = 1.85; $z = -2.44$, $p = 0.015$) and responsible decision-making ($\beta = -3.33$, SE = 1.03; $z = -3.22$, $p = 0.001$). There were no statistically significant differences between students from schools according to their level ethnically diversity for any social and emotional competencies. Students from larger classrooms displayed higher levels of social awareness ($\beta = 0.12$, SE = 0.05; $z = 2.16$, $p = 0.031$) and relationship skills ($\beta = 0.13$, SE = 0.05; $z = 2.82$, $p = 0.005$).

To analyze hypothesis one, cross-level interactions between condition and linear time, and condition and quadratic time were included. There were statistically significant results in all four social and emotional competencies for linear time; the intervention group displayed a more positive evolution during the period analyzed than the control group; self-control, $\beta = 1.10$, SE = 0.35; $z = 3.13$, $p = 0.002$; social awareness, $\beta = 2.08$, SE = 0.43; $z = 4.90$, $p < 0.001$; relationship skills, $\beta = 1.19$, SE = 0.39; $z = 3.11$, $p = 0.002$; responsible decision-making, $\beta = 1.06$, SE = 0.26; $z = 4.08$, $p < 0.001$. There were also statistically significant results for quadratic time in two social and emotional competencies: social awareness ($\beta = -0.71$, SE = 0.20; $z = -3.61$, $p < 0.001$) and responsible decision-making ($\beta = -0.29$, SE = 0.12; $z = -2.39$, $p = 0.017$). For these competencies, the more positive evolution of intervention groups when compared with control groups decelerated between time points two and three.

As seen in Table 2, to analyze hypothesis two, a cross-level interaction between gender, intervention group, and time linear was added. There were statistically significant results for this interaction only for self-control ($\beta = 0.49$, SE = 0.18; $z = 2.30$, $p = 0.006$). Therefore, boys who participated in the program showed a more positive trajectory in self-control than girls. Furthermore, the cross-level interaction between classroom size and time linear introduced to analyze hypothesis three yielded no statistically significant result for any of the analyzed variables.

The influence of implementation quality on the PAUMS SEL program's effectiveness

The second aim of the current study focused on the analysis of the influence of several elements of implementation quality on the effectiveness of the PAUMS SEL program. Accordingly, each of the three hypotheses posed was related to a dimension of implementation quality: fidelity (H3), dosage (H4), and implementers' experience (H5). To test these hypotheses a series of cross-level interactions were added to the final models, which are displayed in Table 3.

Neither hypothesis three nor hypothesis four were supported by the results of the current study because different levels of fidelity and dosage did not lead to statistically significant results in any of the analyzed social and emotional competencies. On the other hand, hypothesis five was partially supported by the results given that the students in the groups where the implementers' experience was higher (PA Torres Vedras) displayed a more positive trajectory in self-control than the group where the implementers' experience was lower (GAK), $\beta = -0.79$, SE = 0.34; $z = 2.30$, $p = 0.021$. It should also be mentioned that there was no statistically significant difference in gains between students in groups where implementers' experience was higher (PA Torres Vedras), and students in groups where implementers' experience was medium (PA Cadaval).

Discussion

The current study had two primary aims. First, it analyzed the effectiveness of the PAUMS SEL program in a dissemination study that used a nationwide sample under the GAK initiative. Second, it analyzed the role of several elements of implementation quality and assessed how they influenced the effectiveness of the PAUMS SEL program. For these purposes, we formulated six hypotheses.

We first hypothesized that the PAUMS SEL would be effective in a nationwide sample. We found that the program was effectively leading to better trajectories over time for the intervention groups when compared with the control groups in all four socioemotional competencies. The results are aligned with previous findings (Coelho et al., 2015a, 2017), which had identified positive results in social awareness and self-control. However, they extend these positive results

TABLE 2 Multilevel model analysis final models for self-reports.

	Self-control		Social awareness		Relationship skills		Responsible decision making	
	β_{0ijk}=14.18 (0.30)***		β_{0ijk}=15.17 (0.38)***		β_{0ijk}=8.32 (0.32)***		β_{0ijk}=6.70 (0.18)***	
	Co-efficient β	SE	Co-efficient β	SE	Co-efficient β	SE	Co-efficient β	SE
Classroom								
Free and reduced school meals	−4.53*	1.86	−4.41	2.41	−2.84	1.89	−3.33**	1.03
Ethnicity	−2.91	2.22	−2.84	2.89	−4.09	2.25	−2.33	1.24
Class room size	−0.01	0.04	0.12*	0.05	0.13**	0.05	0.03	0.03
Group (if intervention group)	−0.58	0.32	−0.87	0.44	0.18	0.33	−0.27	0.19
Student								
Gender (if boys)	−1.01***	0.22	−2.41***	0.27	−0.05	0.25	−0.38**	0.14
Time								
Time linear	−0.26	0.31	−0.83*	0.37	−0.12	0.34	−0.68**	0.23
Time quadratic	0.04	0.14	0.19	0.17	0.04	0.15	0.30**	0.11
Interactions								
Gender (if boys) x Time linear	−0.29	0.16	0.09	0.19	0.01	0.17	0.13	0.12
Classroom size x Time linear	0.01	0.03	0.03	0.04	−0.05	0.02	0.01	0.02
Group (if IG) x Time linear	1.10**	0.35	2.08***	0.43	1.19**	0.38	1.06***	0.26
Group (if IG) x Time quadratic	−0.31	0.16	−0.71***	0.20	−0.32	0.18	−0.29*	0.12
Gender (if boys) x Group (if boys) x Time linear	0.49**	0.18	0.10	0.22	−0.02	0.20	−0.09	0.13
Classroom size x Group (if IG) x Time linear	0.03	0.03	−0.03	0.04	0.06	0.04	0.02	0.02
Estimates of variance parameters								
Repeated measures	2.432***	0.089	3.548***	0.130	2.787***	0.102	1.309***	0.048
Individual intercept	7.387***	0.421	11.116***	0.631	10.374***	0.579	2.943***	0.174
Classroom intercept	0.165	0.139	0.302	0.220	0.072	0.151	0.021	0.048
Classroom slope	0.007	0.015	0.011	0.022	0.028	0.022	−0.009	0.010
Classroom covariance intercept/slope	0.001	0.033	0.115*	0.049	−0.025	0.043	−0.007	0.016
Deviance ($-2_{loglikelihood}$)	10599.500		11508.074		11074.610		8930.443	
Estimated parameters	19		19		19		19	

*$p < 0.05$; **$p < 0.01$; ***$p < 0.001$; IG, Intervention Group.

10.3389/fpsyg.2023.1172517

TABLE 3 Multilevel model analysis final models for self-reports, per intervention group modality.

	Self-control		Social awareness		Relationship skills		Responsible decision making	
	β_{0ijk}=14.40 (0.33)***		β_{0ijk}=14.65 (0.47)***		β_{0ijk}=9.14 (0.35)***		β_{0ijk}=6.85 (0.21)***	
	Co-efficient β	SE	Co-efficient β	SE	Co-efficient β	SE	Co-efficient β	SE
Classroom								
Fidelity	−0.06	0.04	0.02	0.05	−0.04	0.04	−0.01	0.02
Class room size	−0.04	0.05	0.13	0.07	0.09	0.05	0.02	0.03
Group (if intervention group cadaval)	−1.83**	0.68	−0.74	0.99	−1.25	0.70	−0.81	0.42
Group (if intervention group GAK)	−0.76	0.48	−0.45	0.56	−0.66	0.39	−0.46	0.24
Student								
Gender (if boys)	−1.23***	0.26	−2.47***	0.31	−0.24	0.30	−0.46*	0.17
Dosage	−0.05	0.10	0.06	0.13	0.11	0.11	−0.01	0.07
Time								
Time linear	1.23***	0.27	1.01**	0.33	1.17***	0.29	0.45*	0.20
Time quadratic	−0.45**	0.12	−0.51**	0.15	−0.40**	0.14	−0.02	0.09
Interactions								
Gender (if boys) x Time linear	0.25*	0.10	0.18	0.11	0.02	0.10	0.06	0.07
Dosage x Time linear	−0.001	0.05	0.04	0.06	0.02	0.05	−0.01	0.04
Fidelity x Time linear	0.01	0.01	0.02	0.02	0.03	0.02	0.01	0.01
Classroom size x Time linear	0.03	0.02	0.03	0.02	0.03	0.02	0.03	0.02
Group (if IG cadaval) x Time linear	−0.30	0.46	0.93	0.57	−0.82	0.51	0.12	0.35
Group (if IG cadaval) x Time quadratic	0.23	0.21	0.13	0.42	0.03	0.38	−0.22	0.26
Group (if IG GAK) x Time linear	−0.79*	0.34	−0.30	0.26	0.58	0.23	0.002	0.16
Group (if IG GAK) x Time quadratic	0.30	0.16	0.09	0.20	0.05	0.18	0.07	0.12
Estimates of variance parameters								
Repeated measures	2.075***	0.120	3.251***	0.189	2.624***	0.152	1.194***	0.069
Individual intercept	8.125***	0.557	11.571***	0.840	11.665***	0.807	3.354***	0.257
Individual slope	0.332**	0.101	0.097	0.139	0.042	0.110	0.119*	0.054
Individual covariance intercept/slope	−0.439*	0.174	−0.175	0.238	−0.413*	0.206	−0.227**	0.087
Classroom intercept	0.266	0.148	0.658*	0.328	0.072	0.152	0.043	0.053
Deviance ($-2_{loglikelihood}$)	8164.583		8827.737		8513.141		6899.125	
Estimated parameters	20		20		20		20	

*$p < 0.05$; **$p < 0.01$; ***$p < 0.001$; IG, Intervention Group; GAK, Gulbenkian Academies of Knowledge.

10.3389/fpsyg.2023.1172517

to relationship skills and responsible decision-making, two social and emotional competencies that are not assessed in those studies. Furthermore, the current results assume particular relevance because they were obtained using a nationwide sample. Despite the positive trajectory in these competencies, the results from post-intervention to follow-up showed a deceleration in social awareness and responsible decision-making when compared with the results from pre-intervention to post-intervention. Notably, the follow-up assessment occurred after the COVID-19 pandemic lockdown, which may account for the deceleration in the positive results. Because adolescents spend a significant amount of time at school, which provides an important context for interpersonal relations during an important stage of adolescents' development and psychosocial adjustment (Rao and Fisher, 2021), their extended time away from school between post-intervention and follow-up may have affected the program's effectiveness.

We also analyzed if gender and classroom size impacted the program's effectiveness (H2 and H3). Although program effectiveness did not differ by classroom size (thus negating hypothesis three), there was one statistical significance result due to gender; boys benefited more than girls in self-control from participating in the PAUMS SEL program. The current study's results were not aligned with previous literature (e.g., Durlak et al., 2011; Ialongo et al., 2019), which found no differential impact of gender on results from participation in universal SEL programs and did not support the second hypothesis because directly contradicted findings from previous studies (Coelho et al., 2015a, 2017; Coelho and Sousa, 2018) with the PAUMS SEL program which had found that girls benefited more than boys in social awareness. Since this study was a nationwide replication, and there was only one statistically significant gender difference found in program effectiveness, it seems that this PAUMS SEL program is most effective for both genders, which reflects the CASEL principle of equity (Collaborative for Academic, Social, and Emotional Learning [CASEL], 2022). Furthermore, the results showed that students' gains from participating in the PAUMS SEL did not differ according to classroom size. These results were aligned with Coelho and Sousa (2017), but negated hypothesis three and contradicted Coelho and Sousa (2018).

The remaining hypotheses were related to the second aim of the study because they focused on differential effectiveness—that is, which implementation quality variables influenced the effectiveness of the PAUMS SEL program in this nationwide replication. The fourth hypothesis (H4) predicted that the program's effectiveness would be greater if its implementation fidelity was higher. However, the results did not support H4; the PAUMS SEL program's effectiveness did not vary according to the degree of implementation fidelity. Although fidelity is recognized as an important feature in the successful delivery of SEL programs, influencing their effectiveness and outcomes (Durlak and DuPre, 2008; Durlak et al., 2011; Wigelsworth et al., 2016), these results should be viewed in the context of the current study, where there was a very high level of (and very little variance in) implementation fidelity. Therefore, this result supports the findings of Gottfredson and Gottfredson (2002), who concluded that if the program developers provided sufficient training and support to implementers, and if the manuals or lesson plans were highly structured, then the programs might yield good effectiveness in the dissemination phase.

The current study also assessed if the PAUMS SEL program's effectiveness was greater when the implementation dosage was closer to the number of sessions prescribed in the manual (H5). In the current study, the level of exposure to the program was operationalized as the number of sessions in which the students were present. This hypothesis was supported by the results, as there were no significant differences in the PAUMS SEL program's effectiveness due to higher or lower dosages than the ones prescribed in the manual. In other words, maximum effectiveness was achieved under the number of sessions prescribed in the program manual. This is consistent with Tominey and McClelland (2011), who concluded that children who attended at least 11 of 15 sessions showed the strongest gains.

The final hypothesis (H6) regarding implementation quality focused on the implementers' experience. This hypothesis proposed that there was greater effectiveness of the PAUMS SEL program if the implementers' experience was higher. The reports partially supported this hypothesis as they showed greater effectiveness of the PAUMS SEL program on self-control in the modality where the implementers' experience was higher (PA Torres Vedras) than in the modality where the implementers' experience was lower (GAK). However, there were no differences in effectiveness between the modalities where the implementers' experience was higher (PA Torres Vedras) and the implementers' experience was average (PA Cadaval).

Altogether, although the current results support that implementers' experience may influence the effectiveness of an SEL program, they do not support previous findings by Fixsen et al. (2009), who had suggested that up to 4 years of implementation experience were necessary before an implementer achieved acceptable levels of effectiveness.

In sum, the current study supported the effectiveness of the PAUMS SEL program with a nationwide sample, providing additional evidence of its effectiveness on a widespread scale. Additionally, the program yielded similar results for both genders in three of the four social and emotional competencies assessed, which underlines the universal nature of the program. However, students participating in the program from larger classrooms gained more self-control and responsible decision-making, thus highlighting the relevance of classroom size as a relevant variable in effectiveness studies. Furthermore, the current study supported the relevance of assessing implementation quality indicators. Although there were no differences in results between levels of implementation fidelity to the PAUMS SEL program, maximum effectiveness was achieved using the recommended dosage. Additionally, there was some support for the assumption that implementers with the highest experience level achieve more positive results.

Conclusion

The current study supported the conclusion that the PAUMS SEL program is ready to be disseminated in Portugal. Although a previous meta-analysis (Durlak et al., 2011) found that programs implemented without their creators frequently struggle to achieve positive outcomes, the results of the current study showed only one statistically

significant difference between the GAK modality and the PA Torres Vedras modality, i.e., between implementers without previous experience and implementers with wide experience in implementing the program. Furthermore, lessons can be learned about what worked well in this dissemination study. The results provided important conclusions for further dissemination of the PAUMS SEL and similar programs. The collected data offered strong empirical support for the notion that implementation quality affects the effectiveness of mental health promotion programs, as Durlak and DuPre (2008) argued. The results also support that standardization is one of the most important program characteristics (Gottfredson and Gottfredson, 2002). This finding provides support for those who argue that new interventions should be implemented with maximum fidelity in the debate over whether this standardization is preferable or whether adaptation (reinvention) should be permitted or encouraged to meet local needs and preferences (Cross and West, 2011). Specifically, the results of the current study highlight the importance of achieving a good level of implementation quality by providing adequate training, appropriate monitoring, supervision, and using structured manual programs (Durlak et al., 2011; Weissberg et al., 2015). As previously suggested (Gottfredson and Gottfredson, 2002; Fagan and Mihalic, 2003), these elements reduce the amount of content deviation by program implementers, ensuring greater fidelity to program content. Furthermore, the standardization online platform also proved to be adequate support for implementers in achieving program goals. The results also supported the importance to develop measures that accurately assess these fidelity components when conducting dissemination or effectiveness studies, as suggested by McClelland et al. (2017).

Limitations

The potential implications of the current study must be evaluated considering its limitations. A first limitation was that several implementation groups were not concluded due to confinement related to the COVID-19 pandemic, which disrupted normal schooling. Therefore, it was not possible to include almost a third of the groups that initiated the PAUMS SEL program in the current study. This circumstance could have impacted implementation quality, which according to Durlak (2016), either diminishes or increases over time.

In the current study, some independent variables that were analyzed were not possible to manipulate, such as dosage and fidelity. These variables were only assessed through implementers' self-ratings and these depend on the accuracy of the implementers and their perspectives. An implementer may report that an activity was implemented, however, that does not provide information regarding how precise was the delivery and how much of the goals were achieved. Consequently, the variance found was relatively low, which allowed for very few conclusions to be drawn. It would have been adequate to complement the self-ratings with observations by the program developers, following Durlak (2016), who advocated for the use of a combination of methods.

Finally, implementer experience may have been confounded with access to program developers, because PA Torres Vedras and PA Cadaval implementers were in direct contact with the program developers in weekly meetings, whereas GAK implementers, after the initial training, only had two full days of supervision visits annually.

Future directions

Several authors (Durlak and DuPre, 2008; Cooper et al., 2015) considered that implementers' characteristics could impact intervention results. Since, in the current study, the levels of fidelity and dosage were quite similar, some other implementer variables may be influencing the effectiveness of the intervention. Some researchers (St Pierre et al., 2007; Dowling and Barry, 2020) have suggested the social and emotional competencies of implementers as potential predictors of positive intervention effects. Therefore, further studies should investigate other implementers' characteristics, beyond implementers' experience.

Furthermore, Wahl et al. (2014) concluded that the implementers' training had an important effect on mental health promotion program outcomes; programs implemented by psychologists led to more positive results than those implemented by teachers. However, there are currently no reports of the effectiveness of the PAUMS SEL program implemented by teachers. Therefore, future studies should compare the effectiveness of the PAUMS SEL program between implementers with different trainings (e.g., teachers vs. educational psychologists) to analyze if the program is ready for further dissemination.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Ethics statement

The studies involving human participants were reviewed and approved by the Center for Research in Psychology for Positive Development, Lusíada University. Written informed consent to participate in this study was provided by the participants' legal guardian/next of kin.

Author contributions

VC conceived the study and its design, drafted the manuscript, and performed the statistical analysis. MM and PB conceived the study, drafted the manuscript, participated in the interpretation of the data and its implications. All authors read and approved the final manuscript.

Funding

The work was supported by the Fundação Calouste Gulbenkian who financed the open access publication fees, included in their Gulbenkian Academies of Knowledge initiative.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Publisher's note

All claims expressed in this article are solely those of the authors and do not necessarily represent those of their affiliated organizations, or those of the publisher, the editors and the reviewers. Any product that may be evaluated in this article, or claim that may be made by its manufacturer, is not guaranteed or endorsed by the publisher.

Supplementary material

The Supplementary material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/fpsyg.2023.1172517/full#supplementary-material

References

Bradshaw, C. P., Shukla, K. D., Pas, E. T., Berg, J. K., and Ialongo, N. S. (2020). Using complier average causal effect estimation to examine student outcomes of the PAX good behavior game when integrated with the PATHS curriculum. *Admin. Pol. Ment. Health* 47, 972–986. doi: 10.1007/s10488-020-01034-1

Carroll, A., Houghton, S., Forrest, K., McCarthy, M., and Sanders-O'Connor, E. (2020). Who benefits most? Predicting the effectiveness of a social and emotional learning intervention according to children's emotional and behavioural difficulties. *Sch. Psychol. Int.* 41, 197–217. doi: 10.1177/0143034319898741

Coelho, V., and Figueira, A. (2011). Project "positive attitude": promoting school success through social and emotional abilities development. Design for elementary and middle school students, in Portugal. *Int. J. Psychol.* 45, 185–192.

Coelho, V., Marchante, M., and Sousa, V. (2015a). "Positive attitude": a multilevel model analysis of the effectiveness of a social and emotional learning program for Portuguese middle school students. *J. Adolesc.* 43, 29–38. doi: 10.1016/j.adolescence.2015.05.009v

Coelho, V. A., Romão, A. M., Brás, P., Bear, G., and Prioste, A. (2020). Trajectories of students' school climate dimensions throughout middle school transition: a longitudinal study. *Child Indic. Res.* 13, 175–192. doi: 10.1007/s12187-019-09674-y

Coelho, V., and Sousa, V. (2017). The impact of class-level variables on the effectiveness of a middle school social and emotional learning program: a multilevel analysis. *J. Relat. Res.* 8:e21. doi: 10.1017/jrr.2017.21

Coelho, V., and Sousa, V. (2018). Differential effectiveness of a middle school social and emotional learning program: does setting matter? *J. Youth Adolesc.* 47, 1978–1991. doi: 10.1007/s10964-018-0897-3

Coelho, V. A., and Sousa, V. (2020). Validação do questionário de avaliação de competências socioemocionais para alunos de 1° e 2° ciclo do Ensino Básico. *Int. J. Dev. Educ. Psychol.* 2, 431–440. doi: 10.17060/ijodaep.2020.n1.v2.1863

Coelho, V., Sousa, V., and Figueira, A. P. (2014). The impact of a school-based social and emotional learning program on the self-concept of middle school students. *Rev. Psicodidactica* 19, 347–365. doi: 10.1387/RevPsicodidact.10714

Coelho, V. A., Sousa, V., and Marchante, M. (2016). ""Atitude Positiva": Um resumo de 12 anos de resultados de aplicação de programas de Aprendizagem Socioemocional" in *Avaliação e promoção de competências socioemocionais em Portugal*. eds. A. M. Pinto and R. Raimundo (Lisboa: Coisas de Ler), 371–396.

Coelho, V., Sousa, V., Marchante, M., and Romão, A. M. (2015b). Validação do questionário Autoconceito Forma 5 numa amostra de crianças e adolescentes portugueses. *Int. J. Dev. Educ. Psychol.* 1, 67–78.

Coelho, V., Sousa, V., Raimundo, R., and Figueira, A. (2017). The impact of a Portuguese middle school social–emotional learning program. *Health Promot. Int.* 32, 292–300. doi: 10.1093/heapro/dav064

Collaborative for Academic, Social, and Emotional Learning [CASEL] (2022). What is the CASEL framework. Available at: https://casel.org/fundamentals-of-sel/what-is-the-casel-framework/

Cooper, B. R., Bumbarger, B. K., and Moore, J. E. (2015). Sustaining evidence-based prevention programs: correlates in a large-scale dissemination initiative. *Prev. Sci.* 16, 145–157. doi: 10.1007/s11121-013-0427-1

Cross, W., and West, J. (2011). Examining implementer fidelity: conceptualising and measuring adherence and competence. *J. Child. Serv.* 6, 18–33. doi: 10.5042/jcs.2011.0123

Dane, A. V., and Schneider, B. H. (1998). Program integrity in primary and early secondary prevention: are implementation effects out of control? *Clin. Psychol. Rev.* 18, 23–45. doi: 10.1016/S0272-7358(97)00043-3

Domitrovich, C. E., Bradshaw, C. P., Poduska, J. M., Hoagwood, K., Buckley, J. A., Olin, S., et al. (2008). Maximizing the implementation quality of evidence-based preventive interventions in schools: a conceptual framework. *Adv. School Ment. Health Promot.* 1, 6–28. doi: 10.1080/1754730x.2008.9715730

Domitrovich, C. E., Li, Y., Mathis, E. T., and Greenberg, M. T. (2019). Individual and organizational factors associated with teacher self-reported implementation of the PATHS curriculum. *J. Sch. Psychol.* 76, 168–185. doi: 10.1016/j.jsp.2019.07.015

Dowling, K., and Barry, M. M. (2020). Evaluating the implementation quality of a social and emotional learning program: a mixed methods approach. *Int. J. Environ. Res. Public Health* 17:3249. doi: 10.3390/ijerph17093249

Durlak, J. A. (2016). Programme implementation in social and emotional learning: basic issues and research findings. *Camb. J. Educ.* 46, 333–345. doi: 10.1080/0305764X.2016.1142504

Durlak, J. A., and DuPre, E. P. (2008). Implementation matters: a review of research on the influence of implementation on program outcomes and the factors affecting implementation. *Am. J. Community Psychol.* 41, 327–350. doi: 10.1007/s10464-008-9165-0

Durlak, J. A., Weissberg, R. P., Dymnicki, A. B., Taylor, R. D., and Schellinger, K. B. (2011). The impact of enhancing students' social and emotional learning: a meta-analysis of school-based universal interventions. *Child Dev.* 82, 405–432. doi: 10.1111/j.1467-8624.2010.01564.x

Elias, M. J. (2019). What if the doors of every schoolhouse opened to social-emotional learning tomorrow: reflections on how to feasibly scale up high-quality SEL. *Educ. Psychol.* 54, 233–245. doi: 10.1080/00461520.2019.1636655

Evans, R., Murphy, S., and Scourfield, J. (2015). Implementation of a school-based social and emotional learning intervention: understanding diffusion processes within complex systems. *Prev. Sci.* 16, 754–764. doi: 10.1007/s11121-015-0552-0

Fagan, A. A., and Mihalic, S. (2003). Strategies for enhancing the adoption of school-based prevention programs: lessons learned from the blueprints for violence prevention replications of the life skills training program. *J. Community Psychol.* 31, 235–253. doi: 10.1002/jcop.10045

Finn, J. D., Pannozzo, G. M., Naoom, S. F., and Achilles, C.M. (2003). The 'Why's' of class size: Stu-dent behavior in small classes. *Review of Educational Research*, 73, 321–368. doi: 10.3102/00346543073003321

Fixsen, D. L., Blase, K. A., Naoom, S. F., and Wallace, F. (2009). Core implementation components. *Res. Soc. Work. Pract.* 19, 531–540. doi: 10.1177/1049731509335549

Gottfredson, D. C., and Gottfredson, G. D. (2002). Quality of school-based prevention programs: results from a National Survey. *J. Res. Crime Delinq.* 39, 3–35. doi: 10.1177/002242780203900101

Heck, R.H., Thomas, S.L., and Tabata, L.N. (2013). *Multilevel and longitudinal modeling with IBM SPSS* (*2nd*). London: Routledge.

Holsen, I., Smith, B. H., and Frey, K. S. (2008). Outcomes of the social competence program second step in Norwegian elementary schools. *Sch. Psychol. Int.* 29, 71–88. doi: 10.1177/0143034307088504

Ialongo, N. S., Domitrovich, C. E., Embry, D., Greenberg, M., Lawson, A., Becker, C., et al. (2019). A randomized controlled trial of the combination of two school-based universal preventive interventions. *Dev. Psychol.* 56, 1313–1325. doi: 10.1037/dev00 00715

Jones, S. M., Barnes, S. P., Bailey, R., and Doolittle, E. J. (2017). Promoting social and emotional competencies in elementary school. *Futur. Child.* 27, 49–72. doi: 10.1353/foc.2017.0003

Marchante, M., and Coelho, V. A. (2021). O programa de Aprendizagem SocioEmocional - Atitude Positiva 3° ciclo nas Academias Gulbenkian do Conhecimento. *Int. J. Dev. Educ. Psychol.* 2, 461–470. doi: 10.17060/ijodaep.2021.n1.v2.2097

McClelland, M. M., Tominey, S. L., Schmitt, S. A., and Duncan, R. (2017). SEL intervention in early childhood. *Futur. Child.* 27, 33–47. doi: 10.1353/foc.2017.0002

Rao, N., and Fisher, P. A., and COVID-19 Special Section Editors (Eds.) (2021). The impact of the COVID-19 pandemic on child and adolescent development around the world. *Child Dev.* 92, e738–e748. doi: 10.1111/cdev.13653

Reyes, M. R., Brackett, M. A., Rivers, S. E., Elbertson, N. A., and Salovey, P. (2012). The interaction effects of program training, dosage, and implementation quality on targeted student outcomes for the RULER approach to social and emotional learning. *Sch. Psychol. Rev.* 41, 82–99. doi: 10.1037/t36292-000

Sande, M. C. E., Fekkes, M., Kocken, P. L., Diekstra, R. F. W., Reis, R., and Gravesteijn, C. (2019). Do universal social and emotional learning programs for secondary school students enhance the competencies they address? A systematic review. *Psychol. Sch.* 56, 1545–1567. doi: 10.1002/pits.22307

Sentse, M., Veenstra, R., Kiuru, N., and Salmivalli, C. (2015). A longitudinal multilevel study of individual characteristics and classroom norms in explaining behaviors. *Journal of Abnormal Child Psychology*, 43, 943–955. doi: 10.1007/s10802-014-9949-7

Sørlie, M. A. (2021). Structural, cultural and instructional predictors essential to sustained implementation fidelity in schools: the school-wide positive behavior support model (SWPBS). *Int. J. Educ. Res. Open* 2:100082. doi: 10.1016/j.ijedro.2021.100082

St Pierre, T. L., Osgood, D. W., Siennick, S. E., Kauh, T. J., and Burden, F. F. (2007). Project alert with outside leaders: what leader characteristics are important for success? *Prev. Sci.* 8, 51–64. doi: 10.1007/s11121-006-0055-0

Taylor, R. D., Oberle, E., Durlak, J. A., and Weissberg, R. P. (2017). Promoting positive youth development through school-based social and emotional learning interventions: a meta-analysis of follow-up effects. *Child Dev.* 88, 1156–1171. doi: 10.1111/cdev.12864

Tominey, S. L., and McClelland, M. M. (2011). Red light, purple light: findings from a randomized trial using circle time games to improve behavioral self-regulation in preschool. *Early Educ. Dev.* 22, 489–519. doi: 10.1080/10409289.2011.574258

Van Schoiack-Edstrom, L., Frey, K. S., and Beland, K. (2002). Changing adolescents' attitudes about relational and physical aggression: an early evaluation of a school-based intervention. *Sch. Psychol. Rev.* 31, 201–216. doi: 10.1080/02796015.2002.12086151

Wahl, M. S., Adelson, J. L., Patak, M. A., Pössel, P., and Hautzinger, M. (2014). Teachers or psychologists: who should facilitate depression prevention programs in schools? *Int. J. Environ. Res. Public Health* 11, 5294–5316. doi: 10.3390/ijerph110505294

Weissberg, R. P., Durlak, J. A., Domitrovich, C. E., and Gullotta, T. P. (2015). "Social and emotional learning: past, present, and future" in *Handbook of social and emotional learning: research and practice*. eds. J. A. Durlak, C. E. Domitrovich, R. P. Weissberg and T. P. Gullotta (New York: The Guilford Press), 3–19.

Wigelsworth, M., Lendrum, A., Oldfield, J., Scott, A., Ten Bokkel, I., Tate, K., et al. (2016). The impact of trial stage, developer involvement and international transferability on universal social and emotional learning programme outcomes: a meta-analysis. *Camb. J. Educ.* 46, 347–376. doi: 10.1080/0305764X.2016.1195791

frontiers | Frontiers in Psychology

TYPE Original Research
PUBLISHED 26 May 2023
DOI 10.3389/fpsyg.2023.1187255

OPEN ACCESS

EDITED BY
Pedro Rosário,
University of Minho, Portugal

REVIEWED BY
Jeffrey R. Gagne,
Texas A&M University, United States
Maura Pilotti,
Prince Mohammad Bin Fahd University, Saudi Arabia
Armanda Pereira,
University of Trás-os-Montes and Alto Douro, Portugal

*CORRESPONDENCE
Maryse Guedes
✉ mguedes@ispa.pt

RECEIVED 15 March 2023
ACCEPTED 02 May 2023
PUBLISHED 26 May 2023

CITATION
Guedes M, Maia R, Matos I, Antunes M, Rolão T, Chronis-Tuscano A, Rubin KH, Veríssimo M and Santos AJ (2023) Preliminary perceived intervention changes and engagement in an evidence-based program targeted at behavioral inhibition during early childhood, delivered in-person and online.
Front. Psychol. 14:1187255.
doi: 10.3389/fpsyg.2023.1187255

Preliminary perceived intervention changes and engagement in an evidence-based program targeted at behavioral inhibition during early childhood, delivered in-person and online

Maryse Guedes[1]*, Rita Maia[1], Inês Matos[1], Marta Antunes[1], Teresa Rolão[1], Andrea Chronis-Tuscano[2], Kenneth H. Rubin[3], Manuela Veríssimo[1] and António J. Santos[1]

[1]William James Center for Research, ISPA – Instituto Universitário, Lisbon, Portugal, [2]Department of Psychology, University of Maryland, College Park, MD, United States, [3]Department of Human Development and Quantitative Methodology, University of Maryland, College Park, MD, United States

Introduction: Behavioral inhibition during early childhood is one of the strongest risk factors for the development of later anxiety disorders. Recently developed in-person interventions that target both young children who are highly inhibited and their parents (e.g., the *Turtle Program*), have decreased children's anxiety and have increased social participation in the peer group. However, researchers have yet to examine the effects of intervention mode of delivery. In the present study, we compared the pre-to post-intervention changes in child and parenting functioning of families participating in the Turtle Program, delivered in-person and online with those changes made in families allocated to a waiting-list condition; compared session attendance, homework completion and satisfaction with the intervention outcomes of families involved in the Turtle Program, delivered in-person and online; and explored the predictive role of parenting and child factors in session attendance, homework completion and satisfaction with the outcomes of families involved in the Turtle Program, depending on the mode of delivery (in-person vs. online).

Method: Fifty-seven parents of highly inhibited preschoolers (3–5 years), with no diagnosis of selective mutism or developmental disorders, who were randomly allocated to waiting-list (n = 20), *Turtle Program* delivered in-person (n = 17) and online (n = 20) conditions completed the Portuguese versions of the *Behavioral Inhibition Questionnaire*, the *Preschool Anxiety Scale*, the *Social Behavior and Competence Scale*, the *Modified Child-Rearing Practices Questionnaire* at pre- and post-intervention assessment. Parents also completed the *Preschool Shyness Study Satisfaction Survey* at post-intervention assessment.

Results: Independent of intervention mode of delivery, generalized equation estimates revealed a reduction in children's total anxiety symptoms and an improvement in parental nurturing behaviors. Child anxiety and social competence at pre-assessment were the most prominent predictors of session attendance and satisfaction with post-intervention child and parenting outcomes.

Discussion: Overall, this study showed that parents in both intervention conditions perceived comparable positive changes in child functioning from pre- to post-intervention assessment and similar levels of session attendance, homework completion, and satisfaction. Significantly, however, perceived satisfaction with

post-intervention child and parenting outcomes was higher, when children were reported to display higher SEL skills at baseline, independent of the intervention mode of delivery.

KEYWORDS

intervention program, in-person, internet-delivery, early childhood, behavioral inhibition, parenting practices, social and emotional learning (SEL) skills

1. Introduction

Within a developmental–transactional framework, high and stable behavioral inhibition (BI) is a temperament-based wariness to the exposure to novel persons, situations, and activities (Fox et al., 2005). BI has been shown to be a precursor of social reticence with unfamiliar peers and self-imposed isolation in the peer group (anxious withdrawal, AW) at preschool (Rubin et al., 2009; Rubin and Chronis-Tuscano, 2021). The developmental cascade model from BI to social reticence and AW places children at increased risk of experiencing not only later social anxiety (Sandstrom et al., 2020) but also peer exclusion, rejection, and victimization (Rubin et al., 2018).

Developmental–transactional theory and research converge with the central tenets of developmental psychopathology, showing that not all highly inhibited preschoolers experience adverse developmental pathways (Chronis-Tuscano et al., 2009). Research to date has focused on the modifiable factors that can explain differential risk and resilience among inhibited preschoolers and that need to be targeted in early intervention programs (Danko et al., 2018). In line with the developmental–transactional framework (Rubin et al., 2009), caregiving behaviors are considered one of the main modifiable factors that can either buffer or strengthen the associations between BI and later social reticence, AW, and social anxiety (Ryan and Ollendick, 2018; Fox et al., 2023). More specifically, researchers have shown that the associations between BI and later social reticence, AW, and anxiety are strengthened by overprotective, highly controlling parenting (Rubin et al., 2002; Hane et al., 2008; Hastings et al., 2008; Lewis-Morrarty et al., 2012). In fact, this type of caregiving behavior may negatively impact the development of children's emotion-regulation skills (Fox et al., 2023) that are associated with social engagement with peers (Smith et al., 2019). Refraining from social engagement with peers may hinder children's opportunities to acquire age-appropriate social and socio-cognitive skills and to establish positive peer interactions, placing children at increased risk of adverse developmental pathways (Rubin et al., 2018).

Generated knowledge on the transactional paths among parent, child, and peer behaviors has sustained the development of evidence-based intervention programs targeting preschool children who are behaviorally inhibited (Danko et al., 2018; Rubin and Chronis-Tuscano, 2021) to enhance their social and emotional learning (SEL) skills. These abilities to understand the emotions of the self and others, regulate emotion, attention, and behavior, make good decisions regarding social problems, express healthy emotions, and engage in a range of prosocial behaviors (Denham and Brown, 2010) have been promoted through two main traditions of interventions among inhibited preschoolers (Ooi et al., 2022). The first tradition encompasses parent education programs, namely, the *Cool Little Kids* (Rapee et al., 2010), that focus on reducing overprotective and highly controlling parenting behaviors to promote children's social-approach behaviors. The second tradition includes interventions working directly with children, such as the *Social Skills Facilitated Play Program*, aimed at training social, socio-cognitive, and emotional skills in a peer group comprising inhibited preschoolers (Coplan et al., 2010; Coplan, 2020). More recently, interventions that combine both parent-focused and child-focused approaches have been introduced, such as the *Cool Little Kids + Social Skills Facilitated Play Program* (e.g., Lau et al., 2017), adaptations of the *Cool Little Kids* with increased child involvement (Doyle et al., 2021), or the *Turtle Program* (Chronis-Tuscano et al., 2015, 2022).

The 8-week *Turtle Program* comprises parallel parent and child groups with 5–6 families (Chronis-Tuscano et al., 2015). The parent group draws on the Parent–Child Interaction Therapy (PCIT, Eyberg et al., 2008) adapted for anxiety problems (Comer et al., 2018) and includes not only parent psychoeducational activities but also *in vivo* therapist coaching with each parent–child dyad (Danko et al., 2018). The child group extends the *Social Skills Facilitated Play Program* (Coplan et al., 2010) to teach children specific social, socio-cognitive, and emotion-regulation skills, scaffold their interactions with peers through free play and group activities, and promote children's gradual exposure to feared social situations (Danko et al., 2018). In a recent meta-analysis, Ooi et al. (2022) reported that existing evidence-based intervention programs targeting inhibited preschoolers were effective in reducing anxiety diagnoses, parent-reported anxiety symptoms, and parent or teacher-rated BI from pre- to post-intervention; intervention effect sizes were medium (Ooi et al., 2022) to large (Chronis-Tuscano et al., 2015) for these intervention outcomes. In the first trial of the *Turtle Program*, it was revealed that children in the intervention displayed significant improvements in observed peer–play interactions and social initiations and decreased teacher-reported anxiety and fear in school when compared with children allocated to a waiting-list condition (Barstead et al., 2018). With respect to parenting behaviors, a significant increase in parenting positive affect and sensitivity was found in the first trial of the *Turtle Program* (Chronis-Tuscano et al., 2015). The intervention effects of the *Turtle Program* for observed peer interactions, teacher-reported anxiety and fear, and parenting positive affect and sensitivity were of medium magnitude (Chronis-Tuscano et al., 2015; Barstead et al., 2018). Furthermore, a recent randomized controlled trial indicated that the multi-modal

Turtle Program was more effective than the *Cool Little Kids* parent education program at modifying parent behaviors from pre- to post-intervention (Chronis-Tuscano et al., 2022).

Notwithstanding the evidence base on the effectiveness of interventions targeting inhibited preschoolers (Ooi et al., 2022), the success of such programs depends on parent engagement (Novick et al., 2020). However, few studies have examined the predictors of parental engagement in interventions targeting inhibited preschoolers (Novick et al., 2020; Bayer et al., 2021). Focusing on the sociodemographic predictors of parent behavioral engagement, Bayer et al. (2021) found that younger mothers, less educated fathers, and parents with lower household incomes were more likely to report low attendance in *Cool Little Kids*. This study also revealed that parents of girls and those from more advantaged neighborhoods were less prone to practice the learned skills. Novick et al. (2020) examined the child, parent, and intervention-level predictors of parent engagement in both the *Cool Little Kids* and the *Turtle Program*. These researchers considered both behavioral (e.g., session attendance and homework completion) and attitudinal (e.g., the degree to which the intervention is viewed as satisfactory) components. It was found that parents who participated in the *Turtle Program* displayed greater session attendance, lower homework completion, and comparable levels of satisfaction when compared with parents who participated in the *Cool Little Kids*. Few sociodemographic correlates were identified. Pre-intervention child anxiety predicted greater homework completion and session attendance, especially in the *Turtle Program*. However, pre-intervention parent depression predicted lower levels of satisfaction with the *Turtle Program*. In previous research, it has been shown that pre-intervention parenting behaviors, such as less parental praise or greater frequency of negative talk, were associated with behavioral components of parent engagement in PCIT interventions (e.g., Werba et al., 2006; Fernandez and Eyberg, 2009). Nevertheless, to the best of our knowledge, pre-intervention parenting behaviors and child SEL skills that may strengthen or buffer the associations between BI and adverse developmental outcomes (Rubin and Chronis-Tuscano, 2021) have not yet been explored as potential predictors of parent engagement in evidence-based interventions for inhibited preschoolers.

Beyond parent engagement, the accessibility of interventions targeting inhibited preschoolers has been limited by barriers related to their dissemination in the community (Morgan et al., 2016) and, more recently, to the COVID-19 crisis (Comer, 2021). To overcome these barriers, internet-delivery formats of extant interventions targeting inhibited preschoolers have been developed. *Cool Little Kids* has been adapted to a self-administered eight-module online format (Morgan et al., 2016). A pilot study showed that parents receiving either a clinician-supported (via telephone calls with a psychologist at two key points of the intervention) or a clinician-unsupported version of *Cool Little Kids Online* reported a decrease in child anxiety symptoms and diagnoses, as well as life interference (Morgan et al., 2016); the magnitude of the intervention effects was medium (Morgan et al., 2016). Furthermore, parents reported high satisfaction with the intervention (Morgan et al., 2016). The randomized controlled trial has provided additional empirical support for the effectiveness of *Cool Little Kids Online* in reducing child anxiety when compared to a wait-list condition (Morgan et al., 2017). Nevertheless, the magnitude of the decreases in overprotective parenting in *Cool Little Kids Online* was small (Morgan et al., 2017) and the frequency of program skills practice was found to be positively associated with intervention effects on child anxiety (Morgan et al., 2018).

More intensive parenting interventions drawn on PCIT and videoconferencing (e.g., the *iCALM Telehealth Program*) have been introduced to remotely deliver therapist-guided *coaching* to anxious preschoolers and their parents (Cooper-Vince et al., 2016; Comer et al., 2021). Researchers have provided evidence of high parental satisfaction and effectiveness of this internet-delivery format in reducing child anxiety and impairment when compared to a wait-list condition (Comer et al., 2021); pre- to post-intervention changes in child anxiety and impairment were small to medium (Comer et al., 2021). Research on PCIT supports the use of a group format for parents of preschool children (Barnett and Niec, 2018). More specifically, caregivers of inhibited preschoolers have been found to value the social support they received in the parent component of the *Turtle Program* drawn on PCIT adapted to anxiety problems (Danko et al., 2018; Guedes et al., 2021). Recent pilot studies have shown promising findings for internet-delivered group interventions with families of preschool children drawn on PCIT, cognitive-behavioral exposure, and videoconferencing (Hong et al., 2022). Furthermore, the developmental–transactional framework (Rubin et al., 2009; Rubin and Chronis-Tuscano, 2021) supports the need to include not only parent-focused (e.g., PCIT) but also child-focused intervention approaches to enhance children's SEL skills that increase and improve child social-approach behaviors and positive peer interactions.

Introducing an internet-delivered format of the *Turtle Program* may enhance the accessibility of evidence-based interventions targeting inhibited preschoolers in the community. Research comparing internet-delivered and clinic-based interventions, drawn on PCIT, has found positive engagement, satisfaction, and comparable intervention effects on child and parent outcomes for preschoolers with behavioral problems (Comer et al., 2017). Although anxiety disorders are the second leading mental health-related cause of disability-adjusted life years worldwide (Xiong et al., 2022), little is known about the preliminary outcomes and predictors of parent engagement in internet-delivered interventions targeting BI when compared with in-person delivered interventions.

The primary aims of the present study were to: (1) examine pre- to post-intervention changes in child and parenting functioning of Portuguese families participating in the culturally-tailored *Turtle Program* (Guedes et al., 2019a,b, 2021), delivered in-person or online, when compared with families from waiting-list conditions; (2) compare session attendance, homework completion, and satisfaction with the outcomes of families involved in the *Turtle Program*, delivered in-person and online; and (3) explore the predictive role of parenting and child factors in session attendance, homework completion, and satisfaction with the outcomes of families involved in the *Turtle Program*, depending on the mode of delivery (in-person vs. online). Drawing on prior research conducted on the *Turtle Program* in the USA (Chronis-Tuscano et al., 2015; Barstead et al., 2018) and on internet-delivered interventions targeting child BI and anxiety problems

(Morgan et al., 2016; Comer et al., 2021), we expected that parents in both intervention groups would report a significant decrease in perceived child anxiety symptoms (especially, social anxiety), as well as a significant increase in perceived child social competence from pre- to post-intervention when compared with families from a waiting-list condition (H1); intervention effect changes for child anxiety and social competence were expected to be of medium magnitude (greater or equal to 0.50, Hedges, 1981). We also expected a significant improvement in self-reported nurturing parenting behaviors in both intervention groups when compared with the waiting-list condition (H2); intervention effects for self-reported nurturing parenting behaviors were expected to be of medium magnitude ($\geq$0.50, Hedges, 1981).

To the best of our knowledge, only Comer et al. (2017) compared the effectiveness of internet-delivered and clinic-based interventions, drawn on PCIT, targeted at preschoolers who display behavioral problems. Prior research on internet-delivered interventions targeted at inhibited (Morgan et al., 2016, 2017) and anxious (Comer et al., 2021) preschoolers only included waiting-list control groups. Thus, the current state-of-the-art knowledge did not allow us to establish hypotheses concerning the differences in child anxiety symptoms and social competence, nurturing, and controlling parenting behaviors, depending on the intervention mode of delivery (in-person vs. online).

In line with prior research on the *Turtle Program* in the USA (Novick et al., 2020) and on internet-delivered interventions targeting child BI and anxiety problems (Morgan et al., 2016; Comer et al., 2021), we expected that parents in both intervention groups would display high session attendance, homework completion, and satisfaction with parent and child outcomes (H3). The current state-of-the-art knowledge did not allow us to establish hypotheses concerning between-group differences.

Based on prior research on parental engagement in the *Turtle Program* (Novick et al., 2020) and PCIT interventions (e.g., Werba et al., 2006; Fernandez and Eyberg, 2009), we expected that higher levels of child anxiety, higher levels of baseline nurturing parenting behaviors, and lower levels of controlling parenting behaviors would predict higher behavioral (i.e., session attendance and homework completion) engagement (H4). Due to the scarcity and inconsistency of research findings, we did not establish hypotheses concerning the child and parent-level predictors of satisfaction with the post-intervention outcomes and the moderating role of intervention mode of delivery in the associations between child and parent-level predictors and parent behavioral and attitudinal engagement.

2. Methods

2.1. Participants

The sample consisted of 57 primary caregivers (55 mothers and two fathers) of highly inhibited preschoolers who participated in the culturally tailored *Turtle Program* (Guedes et al., 2019a,b, 2021) delivered in-person and online. The inclusion criteria were as follows: (1) child age between 3.5 and 5 years; (2) a positive screening for BI; (3) the ability of parents and children to understand Portuguese, assessed during the pre-intervention assessment interview; and (4) parent consent and child assent to participate in the study. The exclusion criteria were a diagnosis of pervasive developmental disorders or selective mutism. In fact, pervasive developmental disorders encompass not only subjective feelings of fear and anxiety, physiological symptoms, and avoidance behaviors but also problems in social cognition, social skills, social motivation, language, and speech. Although it is typically included in broad anxiety disorders, selective mutism sometimes involves other developmental problems (e.g., developmental delays, language and speech difficulties, and autism spectrum problems). Effective interventions targeted at pervasive developmental disorders and selective mutism require not only focusing on anxiety reduction but also targeting other prototypical social, language, and speech difficulties (Muris and Ollendick, 2021).

Parent participants had a mean age of 37 years ($SD = 3.79$) and had, on average, 15 years of education ($SD = 2.07$). Most caregivers were married or cohabitating ($n = 54$, 93%) and were employed ($n = 51$, 88%). Most parents ($n = 48$, 83%) did not report having any emotional and/or behavioral problems. Children had a mean age of 55 months ($SD = 11.77$). Most children were girls ($n = 31$, 55%) and first-born ($n = 41$, 72%) and had siblings ($n = 39$, 68%). All participants reported that the children's developmental level was as expected for their age. Anxiety disorders were previously identified in three of the children, although these participants were not involved in medical or psychological treatment at the beginning of the *Turtle Program*.

Table 1 shows the baseline sociodemographic and clinical characteristics of parents who were randomly allocated to the *Turtle Program* delivered in-person ($n = 17$), the *Turtle Program* delivered online ($n = 20$), and the waiting list ($n = 20$). Parents from all groups were comparable in terms of parental age ($F = 0.33$, $p = 0.718$), sex ($\chi^2 = 1.44$, $p = 0.486$), years of education ($F = 1.97$, $p = 0.148$), marital status ($\chi^2 = 0.43$, $p = 1.00$), employment status ($\chi^2 = 2.85$, $p = 0.352$), and emotional/behavioral problems ($\chi^2 = 0.36$, $p = 0.854$). The proportion of parents who had boys and girls ($\chi^2 = 1.83$, $p = 0.400$) and first-borns ($\chi^2 = 1.12$, $p = 0.655$) was comparable across the groups. However, significant differences were found in terms of child age ($F = 3.25$, $p = 0.047$). *Post-hoc* comparisons with Bonferonni corrections showed that parents from the waiting list had significantly younger children than parents allocated to the *Turtle Program* delivered in-person. Furthermore, parents allocated to the *Turtle Program* delivered online were less likely to have other children than parents in the remaining two groups ($\chi^2 = 8.44$, $p = 0.015$). Parents reported comparable baseline total child anxiety ($F = 0.87$, $p = 0.423$), child social anxiety ($F = 2.38$, $p = 0.102$), and parenting restrictiveness ($F = 2.26$, $p = 0.116$). Nonetheless, significant differences were found in parenting nurturance ($F = 5.15$, $p = 0.013$). *Post-hoc* comparisons with Bonferonni corrections revealed that parents from the waiting-list reported significantly higher levels of baseline parenting nurturance than parents allocated to the *Turtle Program* delivered in-person.

TABLE 1 Sociodemographic and clinical characteristics of parents who participated in the Turtle Program delivered in-person and online.

	Turtle Program delivered in-person ($n = 17$)	Turtle Program delivered online ($n = 20$)	Waiting-list condition ($n = 20$)
	M (DP) | n (%)	M (DP) | n (%)	M (DP) | n (%)
Parental sex			
Mother	17 (100)	15 (89)	20 (100)
Father	0 (0)	2 (11)	0 (100)
Parental age (years)	37.07 (2.53)	36.89 (3.80)	37.80 (4.76)
Parental marital status			
Married/ cohabitating	16 (94)	17 (89)	19 (95)
Other	1 (6)	2 (11)	1 (5)
Parental education (years)	16.12 (1.41)	15.00 (2.00)	15.20 (2.40)
Parental employment	17 (100)	16 (84)	17 (85)
Parental emotional problems	3 (18)	3 (16)	5 (25)
Child age (months)	60.12 (9.72)	55.58 (12.04)	50.60 (11.34)
Child sex			
Boy	6 (35)	9 (47)	11 (55)
Girl	11 (65)	10 (53)	9 (45)
Child first born	11 (64)	16 (84)	14 (70)
Child siblings	16 (94)	9 (47)	13 (65)

2.2. Procedures

This study is part of a pilot research project approved by the ISPA Ethics Committee.

From October 2018 to January 2020, the *Turtle Program* delivered in-person was presented to parents by pediatricians or preschool teachers from the research group's contact network and advertised in the research project's social networks. Primary caregivers (the parent who demonstrated interest in participating in the *Turtle Program*) were contacted by the research group. During the first contact, parents were informed about the study's aims and procedures. Parents who agreed to participate signed informed consent and completed the pre-assessment, which was conducted by a trained researcher. From October 2020 to October 2021, similar procedures were used to recruit participants for the *Turtle Program* delivered online.

Parents who had children who met the inclusion criteria were invited to participate in a screening interview and to complete self-report questionnaires. After the pre-intervention assessment, parents were randomly allocated to the in-person intervention, online intervention, or waiting list condition. Following the completion of the program by the intervention groups, parents were invited to complete the post-intervention assessment questionnaires. Parents from the waiting-list condition were then invited to participate in the *Turtle Program*. After the completion of the full intervention, parents from all groups were also asked to complete a satisfaction questionnaire. The post-intervention assessment was conducted by a blinded and trained researcher who did not conduct the groups with the families. The flowchart of recruitment and retention data is presented in Figure 1.

2.3. Intervention

2.3.1. *Turtle Program* delivered in-person

This 8-weekly session intervention program (Chronis-Tuscano et al., 2015, 2022) comprised parallel parent and child groups with 5–6 families, oriented by two trained facilitators in each group.

The parent group followed the principles of the Parent–Child Interaction Therapy (PCIT, Eyberg et al., 2008) adapted for anxiety problems in children aged 2–6 years (Pincus et al., 2005; Comer et al., 2018). After a psychoeducation session on anxiety and BI, the parent group started with the first phase of the intervention (Child-Directed Interaction, CDI), during which parents learned to follow the child's lead during a 5-min special time of play. Parents were then involved in the second phase (Bravery-Directed Interaction, BDI), during which they learned the principles of gradual exposure, using hierarchies ("bravery ladders") of feared social situations and contingent rewards for social-approach behaviors. The third phase (Parent–Child Directed Interaction, PDI) taught parents to distinguish between anxious and child-oppositional behaviors and implement effective discipline strategies (effective commands and time-out) for the latter child's behaviors. The sessions of the parent group included not only psychoeducational activities based on direct instruction, role plays, and discussion of written handouts but also *in vivo* therapist coaching of the parent and child together (Danko et al., 2018). Parents were assigned home experiences between each weekly intervention session to practice the skills learned during the parent group (identification of children's anxiety cues, special time of play, and gradual exposure to feared social situations).

The child group extended the *Social Skills Facilitated Play* Program (Coplan et al., 2010). In each session, group leaders taught briefly specific social, social problem-solving, and emotion-regulation skills, using puppets and storytelling (Chronis-Tuscano et al., 2015, 2022). Group leaders also facilitated free play and group activities, using systematic modeling and reinforcement, to scaffold children's peer interactions in an equipped playroom and enhance children's gradual exposure to feared social situations (Danko et al., 2018).

The parent and the child component of the *Turtle Program* were culturally tailored, in accordance with evidence-based recommendations in the field of developmental psychopathology (Gonzales et al., 2016) and in articulation with the research group that originally developed the intervention program. Following a multi-step approach (Gonzales et al., 2016), information on the acceptability of the intervention program was gathered, drawing on the insights of practitioners working with the targeted population (Guedes et al., 2019a,b). Based on practitioners' recommendations, minor culturally tailored modifications were introduced with the

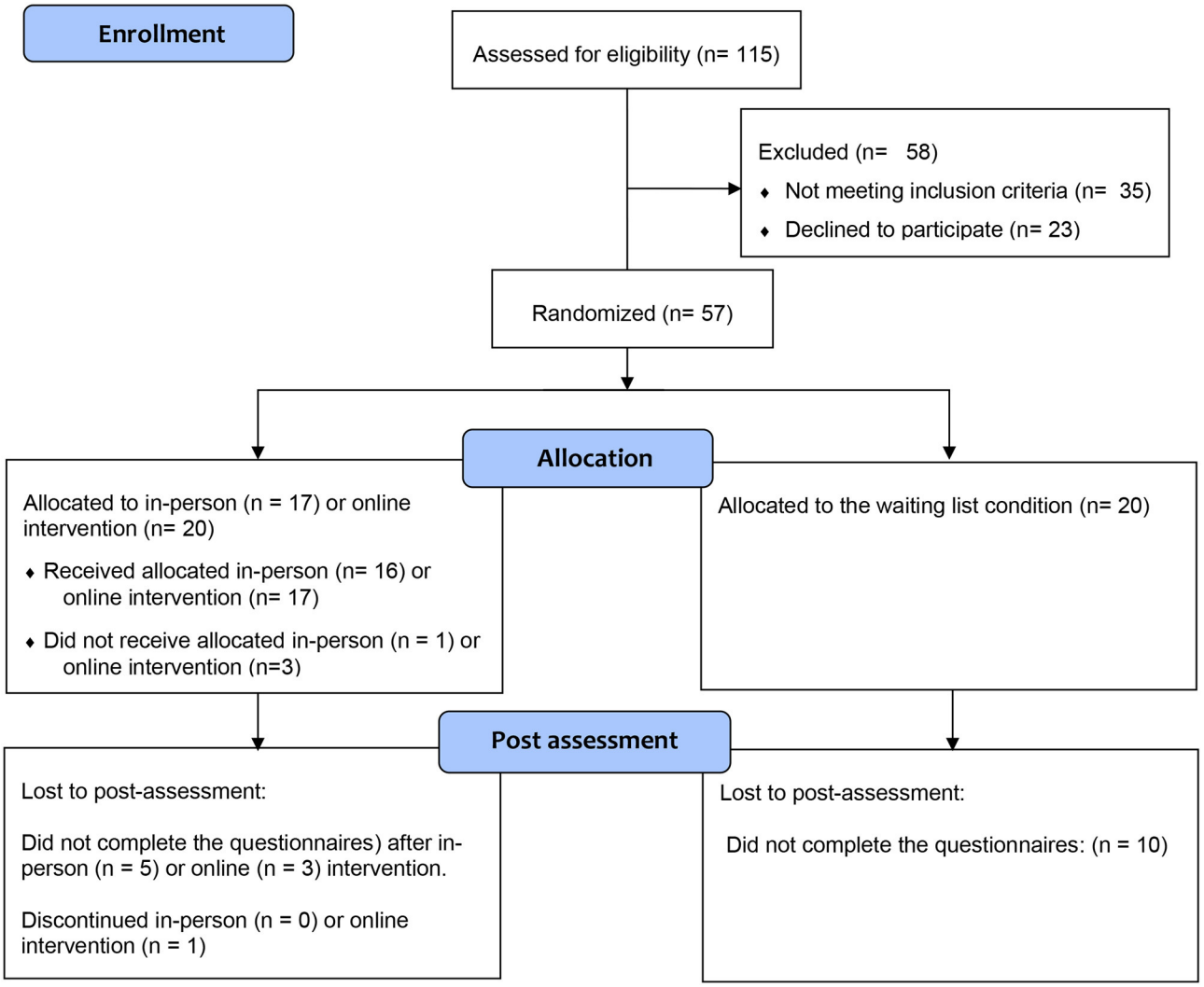


FIGURE 1
The CONSORT Flow diagram of the progress through the phases of a parallel randomized trial of the intervention (in-person and online) and waiting-list groups (that is, enrolment, intervention allocation, post-assessment). Adapted from Schulz et al. (2010).

agreement of the research group who originally developed the intervention program, preliminary tested, and refined, considering parents' perspectives on the acceptability of the intervention program (Guedes et al., 2021).

In the parent component of the *Turtle Program*, intervention sessions were extended (120 min instead of 90 min) to provide more time for group discussion. Minor modifications were only introduced in psychoeducational contents and activities. More specifically, the therapists placed a greater emphasis on the evolutionary roots of BI, non-verbal communication during the CDI phase, and non-material rewards during the BDI phase. Additionally, the intervention contents were conveyed in a culturally sensitive manner, using visual support (e.g., PowerPoint, videos) and more concrete examples (e.g., challenging situations in parent–child interactions and bravery ladders). No modifications were introduced in coaching activities. Homework was renamed as home experiences. Although homework written recordings were recommended for parents' self-reflection, a greater emphasis was placed on the experiential benefits and on the relevance of sharing experiences with the group.

In the child component of the *Turtle Program*, minor modifications were introduced in the way activities were presented to children. More specifically, culturally relevant games were introduced and some intervention activities (e.g., graduation party) were renamed (e.g., bravery party).

Table 2 summarizes the structure and the contents of the eight weekly parent and child groups of the *Turtle Program*, delivered in-person.

2.3.2. *Turtle Program* delivered online

This 8-weekly session intervention was drawn from the culturally tailored *Turtle Program* (Chronis-Tuscano et al., 2015, 2022), delivered in-person (Guedes et al., 2019a,b, 2021) and adapted to real-time internet-delivery, by the research team, from March to October 2020.

TABLE 2 Structure and contents of the Turtle Program delivered in-person and online.

	Turtle Program delivered in-person			*Turtle Program* delivered online		
	Parent group sessions	Child group sessions	Therapist live coaching with parents and children	Parent group sessions	Child videos and home activities with parents	Therapist live coaching with parents and children
1	*Psychoeducation* on BI and anxiety	Learning to introduce yourself	Separation and pick-up	*Psychoeducation* on BI and anxiety	• Video: Expressing emotions • Home activities: puppet modeling, reading stories or watching animation films while promoting emotion knowledge	–
2	*Child-Directed Interaction teach (CDI)*	• Making eye contact • Relaxation (balloon breathing)	Separation and pick-up	*Child-Directed Interaction teach (CDI)*	• Video: Relaxation (balloon breathing) • Home activities: puppet modeling, balloon breathing in daily anxious situations	–
3	*Child-Directed Interaction (CDI) coach* during which the other parent group members observe each parent-child dyad being coached via a TV monitor.	Communicating to keep friends	Individual coach with each parent-child dyad through a bug-in-ear	*Child-Directed Interaction (CDI) coach,* during which other parent group members problem-solve special time and discuss special time videos	• Video: Learning to introduce yourself and making eye contact • Home activities: puppet modeling, practice social initiation during parent-child play	Individual coach with each parent-child dyad through bug-in-ear in a Zoom simultaneous room
4	*Bravery-Directed Interaction (BDI) teach*	Facing your fears	Separation and pick-up	*Bravery-Directed Interaction (BDI) teach*	• Storytelling: Facing your fears • Home activities: storytelling, coloring bravery ladders	–
5	*Bravery-Directed Interaction (BDI) coach 1* during which other parent group members prepare and problem-solve exposure practice.	Expressing emotions	Individual coach on an in-session bravery challenge with each parent-child dyad through a bug-in-ear	*Bravery-Directed Interaction (BDI) coach 1* during which other parent group members prepare and problem-solve exposure practice.	• Video: Communicating to keep friends • Home activities: puppet modeling, promoting sharing of interests and positive things in parent-child interactions	Individual coach on an in-session bravery challenge with each parent-child dyad through a bug-in-ear in a Zoom simultaneous room
6	*Bravery-Directed Interaction (BDI) coach II* during which other parent group members prepare and problem-solve exposure practice.	• Dealing with disappointment • "Show and tell", observed by parents via a TV monitor	Individual coach on the preparation for the show-and-tell activity with each parent-child dyad through a bug-in-ear	*Bravery-Directed Interaction (BDI) coach II* during which other parent group members prepare and problem-solve exposure practice.	• Video: Dealing with disappointment • Session group activity: "Show and tell" with parents and children. • Home activities: puppet modeling, dealing with refusal to play from family members	Individual coach on the preparation for the show-and-tell activity with each parent-child dyad through a bug-in-ear in a Zoom simultaneous room
7	*Parent-Directed Interaction (PDI) teach*	• Working together • Scavenger hunt	Separation and pick-up	*Parent-Directed Interaction (PDI) teach*	• Video: Working together • Home activities: puppet modeling, promoting negotiation skills during play with family members	–
8	*Parent-Directed Interaction (PDI) review and planning of future*	• Review • Scavenger hunt	Graduation party involving scavenger hunt with parents, graduation ceremony and snack time	*Parent-Directed Interaction (PDI) review and planning of future*	• Video: Review • Scavenger hunt	Graduation party with scavenger hunt involving all parents and children

Partially adapted from Danko et al. (2018).

This intervention consists of a parent group with 5–6 families, oriented by two trained facilitators on Zoom. Similar to the *Turtle Program* delivered in-person (Danko et al., 2018), the parent group follows the principles of PCIT (Eyberg et al., 2008) adapted for anxiety problems 0Comer et al., 2018). The psychoeducational activities and contents (see Table 2) are comparable to those of

the culturally tailored *Turtle Program* delivered in-person (Danko et al., 2018; Guedes et al., 2019b, 2021). *In vivo* therapist coaching of the parent and the child together was adapted according to the guidelines for the internet-based delivery of the Parent–Child Interaction Therapy (Comer et al., 2015), and the CDI coaching session was delivered with each parent–child dyad individually. As in the *Turtle Program* delivered in-person, parents were assigned home exercises between each intervention session to promote the practice of the learned skills during the parent group.

Due to the children's young age, no concurrent child group was implemented in the *Turtle Program* delivered online. However, the psychoeducational contents, drawn on the *Social Skills Facilitated Play Program* (Coplan et al., 2010), targeted at children in the *Turtle Program* delivered in-person were presented in short animation videos to both parents and children at the end of each parent group session. Parents were assigned homework experiences to practice children's social, social problem-solving, and emotion-regulation skills, using puppet modeling, storytelling, and/or scaffolding in daily parent–child interactions (see Table 2). The children's group activities of the *Turtle Program* that were delivered in-person (such as show and tell and scavenger hunt) were adapted to internet-based delivery and introduced at the end of the parent group sessions to scaffold peer interaction and enhance the child's gradual exposure to feared social situations.

Families were provided detailed written information about the access to the Zoom platform, the protection measures to be implemented during the intervention sessions, and the access to the intervention materials (e.g., parent activities manual and short animation videos for children) between each intervention session. Facilitators were available before the beginning of the intervention program and 10–15 min before each of the intervention sessions to provide individual support to the families who experienced difficulties in acceding to the Zoom platform. Support was also available between each intervention session when families identified difficulties in accessing the intervention materials (e.g., parent intervention manual and short animation videos for children).

2.4. Instruments

During the pre-intervention assessment, the following instruments were used:

2.4.1. Sociodemographic and clinical form

Parents provided information on their child (age, sex, birth order, and number of siblings) and own (age, education, and employment status) sociodemographic data. With respect to clinical data, parents were asked to report if they and/or their child were experiencing any developmental, emotional, and/or behavioral problems. If they responded affirmatively, parents reported the type of developmental, emotional, and/or behavioral problem that they and/or their child were experiencing and whether they were receiving any intervention for the reported problems.

2.4.2. Selective mutism and additional childhood disorders supplementary modules—Anxiety diagnostic interview schedule for DSM-IV—Parent version

The selective mutism and additional childhood disorders supplementary modules of the ADIS-IV-P (Albano and Silverman, 1996; Russo et al., 2011) were used to conduct the screening evaluation of the exclusion criteria (i.e., diagnosis of developmental disorders or selective mutism) in the present study. The ADIS-IV-P is one of the most studied clinical interviews to assess children's anxiety disorders and other associated disorders (Silverman and Ollendick, 2005). This clinical interview has shown strong reliability in prior research with preschool children (Kennedy et al., 2009). The selective mutism module of the ADIS-IV-P includes eight yes/no questions assessing diagnostic criteria related to the child's persistent inability to speak at school (e.g., "does the child refuse to speak at school?") and in other social situations (e.g., "does the child refuse to answer friends and other people who ask questions?"), the child's ability to speak at home (e.g., "does the child talk when he/she is at home with the rest of the family?"), the interference of the child's behavior at school (e.g., "has the school became [SIC] difficult because of his/her not talking?") and in the family (e.g., "do you get upset because the child won't speak to other people), and the length of the reported difficulties (e.g., "has this [SIC] going on for longer than the first month of school?"). The additional childhood disorders module focusing on pervasive developmental disorders consisted of seven yes/no questions assessing diagnostic criteria related to child social interaction (e.g., "does your child has [SIC] difficulties in dealing with social interaction? For example, does he/she seem awkward in social interactions, fail to respond to others, or seem uninterested in socializing?"), communication (e.g., "does he/she has [SIC] difficulties in communicating with others? For example, does he/she delayed in his/her speech abilities [SIC], or does he/she have difficulty in initiating or following conversations?") and ritualistic behaviors (e.g., "is your child overly preoccupied with repeating things, such as certain body movements, routines, or rituals?"), and their interference in four relevant areas of child life (school, friendships, family life, sleep, eating, and concentration).

During the pre- and post-intervention assessment, parents completed the following questionnaires:

2.4.3. Behavioral inhibition questionnaire

The BIQ (Bishop et al., 2003; Fernandes et al., 2017) is one of the best-documented parent rating scales to measure children's inhibited behaviors during the preschool years (Kim et al., 2011). This rating scale corresponds with traditional laboratory observational methods for assessing BI and has been widely implemented as a stand-alone method of BI assessment (Mernick et al., 2018). The BIQ consists of 30 items that assess parent perceptions of the child's BI, considering six contexts that reflect three domains: Social Novelty (14 items), which refers to the child's inhibited behaviors toward unfamiliar adults, unfamiliar peers, and performance situations in front of others; Situational Novelty (12 items), which refers to the child's inhibited behaviors during separation and at preschool and unfamiliar situations;

and Physical Activities (four items), which refers to the child's inhibited behaviors when there is a minor possible risk of injury. For each item, parents were asked to report how frequently their children displayed inhibited behaviors, using a Likert scale ranging from 1 (*Almost Never*) to 7 (*Almost Always*). Higher total scores in the BIQ indicated higher levels of child BI. Children whose mothers reported mean total scores higher than the reference mean scores plus one standard deviation (Fernandes et al., 2017) were considered eligible. Cronbach's alphas for the total score were 0.68 at the pre-intervention assessment and 0.87 at the post-intervention assessment.

2.4.4. Social competence and behavior evaluation scale—Parent version (SCBE-30)

This 30-item rating scale (LaFreniere and Dumas, 1996; Fernandes et al., 2020) assessed parent perceptions about the affective quality of the relationships that children aged 30–78 months establish with peers and significant adults in context. This rating scale has been widely used in different cultures (LaFreniere et al., 2002) and provides a standardized description of affect and behavior in context, discriminating behavioral–emotional problems and social adjustment (LaFreniere and Dumas, 1996). Items were answered using a 6-point Likert scale, ranging from 1—*Never* to 6—*Always*. The SCBE-30 consists of three scales with 10 items each: Anger–Aggression, referring to externalizing behaviors; Anxiety–Withdrawal, encompassing internalizing behaviors; and Social Competence, assessing prosocial behaviors. For the purposes of the present study, we only considered Social Competence. Cronbach's alphas for Social Competence were 0.65 and 0.64 at pre-intervention and post-intervention, respectively.

2.4.5. Preschool anxiety scale—Parent version

The PAS (Spence et al., 2001; Almeida and Viana, 2013) is one of the only rating scales that was specifically developed for assessing anxiety symptoms among preschoolers in accordance with the DSM-IV (Orgilés et al., 2018). This 28-item rating scale assessed parent's perceptions about the frequency of anxiety symptoms among their preschool children considering five dimensions: Generalized Anxiety, Social Anxiety, Separation Anxiety, Fears of Physical Injury, and Obsessive–Compulsive Disorder. The PAS also yields a Total Anxiety score. Parents were asked to respond to each of the presented items using a 4-point Likert scale ranging from 0—*Never* to 4—*Always*. For the purposes of the present study, we only considered the Total Anxiety score and the Social Anxiety subscale. In fact, the meta-analysis of Sandstrom et al. (2020) found that BI is a risk factor for later anxiety disorders, especially social anxiety. At the pre-intervention assessment, Cronbach's alphas were 0.91 and 0.71 for Total Anxiety and Social Anxiety, respectively. At post-intervention assessment, Cronbach's alphas were 0.91 and 0.75 for Total Anxiety and Social Anxiety, respectively.

2.4.6. Child-rearing practice report questionnaire

The CRPR-Q (Rickel and Biasatti, 1982; Ribeiro et al., 2021) provides a less time-consuming assessment of child-rearing practices, in terms of broader dimensions of parenting qualities. Since its development, this self-report questionnaire has been used in a wide range of studies conducted with community and clinical samples of preschool children from different cultural settings (e.g., Andersson and Sommerfelt, 2001; Woolfson and Grant, 2006). The CRPR-Q is a 40-item self-report questionnaire that assesses parental child-rearing attitudes, values, behaviors, and goals. Four items from the original 40 items were removed because their content related to sexual issues was perceived to be inappropriate in prior studies. Parents were asked to answer each of the presented statements, considering the child who was participating in the present study. For each of the presented statements, parents rated their degree of agreement over the past month using a 6-point Likert scale from 1 (*Strongly Disagree*) to 6 (*Strongly Agree*). The CRPR-Q consists of two subscales of 18 items each. Nurturance encompasses parenting practices focusing on care, affection, and sharing feelings (e.g., "I express affection by hugging, kissing, and holding my child"). Restrictiveness refers to parenting practices focusing on the control of child behaviors (e.g., "I prefer that my child not try things if there is a chance he will fail"). Item ratings pertaining to each subscale are averaged to yield a subscale score. At the pre-intervention assessment, Cronbach's alphas were 0.77 and 0.76 for Nurturance and Restrictiveness, respectively. At post-intervention assessment, Cronbach's alphas were 0.70 and 0.81 for Nurturance and Restrictiveness, respectively.

During the intervention program, facilitators recorded the primary caregiver's attendance in each session.

At post-intervention assessment, the following instruments were used:

2.4.7. Engagement in homework experiences

Parents were asked to rate how much homework they completed (Novick et al., 2020) using a 7-point Likert scale ranging from 0—*None* to 6—*All*.

2.4.8. Preschool shyness satisfaction study questionnaire

This questionnaire (Chronis-Tuscano et al., 2015) consisted of 4 sections that assessed: (1) the perceived appropriateness of the intervention sessions; (2) the satisfaction with post-intervention parenting outcomes; (3) the satisfaction with post-intervention child outcomes; and (4) parental overall satisfaction with the intervention program and suggestions of improvements. For the purposes of the present study, we only examined parental responses to the questions from the second and third parts of the questionnaire. With respect to satisfaction with post-intervention parenting outcomes, parents were asked to report how much the participation in the intervention changed their parenting when their child is anxious and their satisfaction as a parent using a 7-point Likert scale ranging from 0—*Not at All* to 6—*Very Much*. In the section about satisfaction with post-intervention child outcomes, parents were asked to report how satisfied they were

with progress in their child's behaviors (from 0—*Not at All* to 6—*Very Satisfied*) and to rate the evolution of child difficulties after the participation in the intervention program (from 0—*Very Much Worse* to 6—*Very Much Improved*).

2.5. Data analysis

Data analysis was performed using IBM SPSS Statistics, version 28.0. Descriptive statistics and comparison tests (*t*-tests and chi-square tests with Fisher correction, when applicable) were computed for sample characterization and baseline comparisons of child and parenting functioning.

Due to its robustness to small sample sizes and missing values, generalized estimating equations (GEE) were used to explore the intervention effects of the *Turtle Program* delivered in-person and online in the child (total/social anxiety symptoms and social competence) and parenting (parenting nurturance and restrictiveness) functioning when compared to the waiting-list condition. The intervention effects of the *Turtle Program* delivered in-person and online, were also examined. Unstructured correlation matrices were selected for each parameter based on the lowest quasi-likelihood under the independence model criterion (QIC) value and *a priori* hypotheses. The main effects of Time, Group, and the interaction effect of Time × Group were considered. Estimated marginal means were calculated using simple and pairwise comparisons for main and interaction effects. Effect sizes were estimated using Hedges's g (Hedges, 1981) and interpreted as: 0.2 (small), 0.5 (medium), and 0.8 (large).

ANOVAs and MANOVAs were conducted to examine session attendance, homework completion, and satisfaction with parent and child outcomes, using the intervention mode of delivery (in-person *vs.* online) as a between-subjects factor. Due to its robustness with small sample sizes (Tabachnick and Fidell, 2007), Pillai's Trace criterion (V) was selected for MANOVAs as the multivariate test to assess the statistical significance of the main effect of intervention mode of delivery on the set of items assessing satisfaction with parent and child outcomes.

Preliminary Pearson and point-biserial correlation analyses were conducted to identify the control variables (sociodemographic variables) and pre-intervention parenting and child variables (pre-intervention parenting nurturance and parenting restrictiveness and child BI, total anxiety, social anxiety, and social competence) that were significantly correlated with the outcomes (session attendance, homework completion, satisfaction with parent and child outcomes). When a significant correlation between a pre-intervention and outcome variable was found, moderated regression analyses were conducted in accordance with the procedures recommended by Aiken and West (1991). In the first step, control variables (child and parent sociodemographic characteristics) that were significantly correlated with the outcome were introduced, when applicable. In the second step, the pre-intervention parenting or child variable (which was centered) and the moderator (intervention mode of delivery, dummy-coded as 1—in-person and 0—online) were introduced. In the last step, the interaction term was introduced.

Post-hoc power calculations using G*Power with a significance level of 0.05 and power ≥0.80 (small: $f = 0.10$; medium: $f = 0.25$; large: $f = 0.40$; Faul et al., 2007, 2009) showed that large effects could be detected.

3. Results

3.1. Pre- to post-intervention changes in the *Turtle Program* delivered in-person, in the *Turtle Program* delivered online, and in the waiting-list condition

Table 3 summarizes the descriptive statistics (mean and standard deviations) of mother-reported child total anxiety symptoms, social anxiety symptoms, social competence and mother-reported parenting nurturance and restrictiveness in the three groups.

3.1.1. Pre- to post-intervention changes in the Turtle Program delivered in-person when compared with a waiting-list condition

A marginally significant Time × Group effect was found for child total anxiety. Table 4 shows parameter estimates for Time × Group effects. Child anxiety decreased from pre- to post-intervention assessment in the *Turtle Program* delivered in-person but not in the waiting-list condition. A marginally significant Time effect was found for child social anxiety and social competence. Child social anxiety symptoms decreased [$B = 2.20$, $SE = 1.22$, (CI 95%: −0.19/0.46), $\chi^2 = 3.24$, $p = 0.071$], whereas child social competence increased [$B = -0.42$, $SE = 0.16$, (CI 95%: −0.75/−0.10), $\chi^2 = 6.37$, $p = 0.012$] in both groups, from pre- to post-intervention assessment.

A significant Time × Group effect was found for parenting nurturance. As shown in Table 4, parenting nurturance increased in the *Turtle Program* delivered in-person, but decreased in the waiting-list condition. No significant main and interaction effects were found for parenting restrictiveness.

3.1.2. Pre- to post-intervention changes in the *Turtle Program* delivered online when compared with a waiting-list condition

A statistically significant Time × Group effect was found for child total anxiety (see Table 4). Perceived child total anxiety increased in the waiting-list condition but decreased in the *Turtle Program* delivered online. Table 4 also shows that a marginally significant Time x Group effect was found for child social anxiety. Perceived child social anxiety tended to remain stable in the waiting-list condition but tended to decrease in the *Turtle Program* delivered online. A significant main effect of Time was found for child social competence [$B = -0.31$, $SE = 0.12$, (CI 95%: −0.53/−0.08), $\chi^2 = 7.25$, $p = 0.007$]. Child social competence increased in both groups from pre- to post-intervention assessment.

A marginally significant Time × Group effect was found for parenting nurturance. Parenting nurturance tended to increase in

TABLE 3 Behavioral inhibition, anxiety symptoms, social competence, parenting practices, session attendance, homework completion, and satisfaction with child and parent outcomes in the Turtle Program delivered in-person and online.

	Turtle Program delivered in-person		*Turtle Program* delivered online		Waiting-list condition	
	Baseline ($n = 17$)	Post-intervention ($n = 11$)	Baseline ($n = 20$)	Post-intervention ($n = 13$)	Baseline ($n = 20$)	Post-intervention ($n = 10$)
	M (DP)	M (DP)	M (DP)	M (DP)	M (DP)	M (DP)
Child outcomes						
Child total anxiety symptoms	43.13 (18.21)	39.38 (17.43)	49.42 (17.06)	34.00 (11.02)	43.40 (15.46)	45.62 (11.61)
Child social anxiety symptoms	15.29 (4.81)	13.61 (4.55)	15.26 (3.71)	11.18 (2.67)	12.68 (4.30)	11.75 (3.73)
Child social competence	4.30 (0.47)	4.54 (0.60)	4.29 (0.55)	4.70 (0.44)	4.29 (0.73)	4.47 (0.73)
Parent outcomes						
Parenting nurturance	5.23 (0.31)	5.44 (0.27)	5.36 (0.46)	5.47 (0.33)	5.52 (0.20)	5.24 (0.21)
Parenting restrictiveness	2.88 (0.57)	2.84 (0.41)	2.74 (0.59)	2.95 (0.71)	3.12 (0.55)	3.24 (0.66)

the *Turtle Program* delivered online, but decreased in the waiting-list condition. No significant main or interaction effects were found for parenting restrictiveness.

3.1.3. Pre- to post-intervention changes in the *Turtle Program* delivered in-person and online

A statistically significant Time effect was found for child total anxiety. Perceived child total anxiety [$B = 11.63$, $SE = 3.25$, (CI 95%: 5.27/17.99), $\chi^2 = 12.83$, $p < 0.001$] and social anxiety [$B = 3.30$, $SE = 0.78$, (CI 95%: 1.78/4.82), $\chi^2 = 7.26$, $p = 0.007$] decreased, whereas social competence [$B = 0.31$, $SE = 0.12$, (CI 95%: −0.53/−0.08), $\chi^2 = 12.83$, $p < 0.001$] increased in both intervention groups from pre- to post-intervention assessment. A marginally statistically significant Time effect was found for parenting nurturance [$B = -0.14$, $SE = 0.08$, (CI 95%: −0.31/0.02), $\chi^2 = 2.96$, $p = 0.086$], which tended to increase in both groups. No significant Time or Time × Group effects were found for parenting restrictiveness.

3.2. Parent engagement in the *Turtle Program* delivered in-person and online

Table 3 displays the descriptive statistics of session attendance, perceived homework completion, and satisfaction with parenting and child outcomes of parents who provided reports on their satisfaction with the participation in the *Turtle Program* delivered in-person ($n = 13$) and online ($n = 20$). Both groups displayed comparable sociodemographic and clinical characteristics, as well as baseline child anxiety, social anxiety, social competence, and parent-reported nurturance and restrictiveness.

ANOVAs revealed that parents who participated in the *Turtle Program* delivered in-person and online reported having participated in a comparable number of sessions ($F = 1.02$, $p = 0.319$, $\eta_p^2 = 0.031$) and home skills exercises ($F = 1.53$, $p = 0.227$, $\eta_p^2 = 0.050$).

MANOVAs indicated that parents who participated in the *Turtle Program* delivered in-person and online did not report statistically significant differences in satisfaction with parenting outcomes (i.e., changes in parenting behavior and satisfaction), $V = 0.09$, $F = 1.46$, $p = 0.251$, $\eta_p^2 = 0.094$. With respect to satisfaction with child outcomes (i.e., satisfaction with child progress and perceived improvement in child difficulties), no statistically significant differences were identified between parents who participated in the *Turtle Program* delivered in-person and online, $V = 0.06$, $F = 0.88$, $p = 0.423$, $\eta_p^2 = 0.060$.

3.3. The predictive role of pre-intervention parenting and child factors in session attendance, homework completion, and satisfaction with parent and child post-intervention outcomes

Table 5 displays the Pearson and point-biserial correlations between the control, study, and outcome variables. Session attendance was negatively associated with pre-intervention child social anxiety and positively associated with having a first-born child and pre-intervention parenting nurturance. No significant correlations with the pre-intervention parenting or child variables and the outcomes were found. Pre-intervention child social competence was positively correlated with changes in parenting satisfaction and satisfaction with child progress. Pre-intervention child total anxiety symptoms and parenting restrictiveness were negatively correlated with perceived improvement in child difficulties.

TABLE 4 Statistically significant main time effects for caregiver-reported child behavioral inhibition, total and social anxiety symptoms, and social competence.

	B (SE)	95% CI	χ^2	*p*	*g*
Turtle Program delivered in-person vs. Waiting-List condition					
Child total anxiety symptoms	−9.43 (4.88)	−18.99/0.13	3.73	0.053	−0.20
Parenting nurturance	0.49 (0.23)	0.02–0.96	4.30	0.038	0.69
Turtle Program delivered online vs. Waiting-List condition					
Child total anxiety symptoms	−13.86 (4.92)	−23.49/−4.22	7.94	0.005	−1.00
Child social anxiety symptoms	−2.37 (1.37)	−5.04/0.31	3.00	0.083	−1.18
Parenting nurturance	0.43 (0.24)	−0.05/0.91	3.03	0.082	0.25

TABLE 5 Pearson and point-biserial correlations between the control (sociodemographic and clinical), study (baseline child and parenting functioning), and outcome variables (satisfaction with post-intervention parenting and child outcomes).

	In-person (n = 13)	Online (n = 20)	Pearson and point-biserial correlations														
	M (SD)	M (SD)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Session attendance	6.79 (1.87)	6.09 (1.89)	−0.06	−0.13	0.32	−0.19	−0.05	0.12	−0.23	−0.24	0.37*	−0.09	0.14	−0.25	−0.36*	0.49*	−0.02
Homework completion	4.28 (0.77)	4.79 (0.94)	−0.08	0.32	0.13	−0.28	−0.02	−0.27	0.01	−0.07	0.47*	−0.02	0.23	−0.13	−0.12	0.17	0.26
Changes in parenting behavior	4.31 (1.18)	4.00 (1.02)	0.02	−0.04	−0.31	−0.27	0.04	0.13	0.03	0.11	−0.08	0.03	0.18	0.04	0.04	0.05	0.06
Changes in parenting satisfaction	4.00 (1.22)	3.06 (1.66)	−0.07	−0.14	−0.30	−0.24	−0.05	−0.03	0.08	−0.07	0.01	0.17	0.49*	−0.16	−0.15	0.14	−0.00
Satisfaction with child progress	4.85 (0.80)	4.78 (1.35)	−0.03	−0.12	−0.19	−0.24	0.04	−0.01	0.01	−0.07	0.11	−0.07	0.41*	−0.26	0.08	−0.15	−0.06
Improvement in child difficulties	4.77 (0.73)	4.44 (0.78)	−0.10	−0.02	−0.10	0.12	−0.04	−0.26	−0.13	−0.35	−0.20	0.12	0.22	−0.60**	−0.19	0.07	−0.43*

1, Parental sex (dummy coded as: 1-mother, 0 – father); 2, Parental age; 3, Parental marital status (dummy coded as: 1, married/cohabitating, 0, other); 4, Parental education; 5, Parental employment (dummy coded as: 1, employed, 0, unemployed); 6, Parental emotional problems (dummy-coded as: 1, yes, and 0, no); 7, Child age; 8, Child sex (dummy coded as 1, boy, 0, girl); 9, Child first-born (dummy coded as 1, yes, 0, no); 10, Child siblings (dummy-coded as 1-yes, 0, no); 11, Child pre-intervention social competence; 12, Child pre-intervention Total Anxiety; 13, Child pre-intervention Social Anxiety; 14, Parenting nurturance; 15, Parenting restrictiveness.
*$p < 0.05$, **$p < 0.01$.

Table 6 shows that parents who had first-born children perceived their children as less socially anxious and reported higher levels of parenting nurturance at pre-intervention assessment and attended a higher number of sessions. No moderation effect of the intervention mode of delivery was found.

Additionally, parents who described their children as more socially competent at pre-intervention assessment reported greater changes in parenting satisfaction and higher levels of satisfaction with child progress post-intervention. The intervention mode of delivery did not moderate the associations between the study and outcome variables.

Finally, parents who perceived their children as less anxious at pre-intervention assessment reported greater improvements in child difficulties. No moderation effect of the intervention mode of delivery was found.

4. Discussion

To the best of our knowledge, this is the first study to examine perceived pre- to post-intervention changes in child and parenting functioning and the engagement of families involved in the culturally tailored *Turtle Program* delivered in-person and online in a European country and to explore the predictive role of child and parenting factors for caregivers' engagement, depending on the intervention mode of delivery.

Our findings are partially consistent with our first research hypothesis (H1). Independent of the intervention mode of delivery, our findings show that participation in the *Turtle Program* seems to be associated with a reduction in total anxiety and social anxiety symptoms from pre- to post-intervention. The higher magnitude of the reduction in parent-reported

TABLE 6 Predictive role of parenting and child factors for session attendance, homework completion, and satisfaction with post-intervention parenting and child outcomes, depending on the intervention mode of delivery.

	β	ΔF	ΔR^2
	Session attendance		
Step 1. Covariates		4.94*	0.13
First-born[a]	0.36*		
Step 2. Main effects		4.15*	0.19
Pre-intervention child social anxiety	−0.34*		
Intervention mode of delivery	0.26		
Step 3. Interaction effect		0.01	0.00
Step 1. Covariates			
First-born[a]	0.29	2.82	0.09
Step 2. Main effects			
Pre-intervention parenting nurturance	0.49**	5.61**	0.26
Intervention mode of delivery	0.08		
Step 3. Interaction effect		2.59	0.05
	Changes in parenting satisfaction		
Step 1. Main effects			
Pre-intervention social competence	0.49*	3.72*	0.24
Intervention mode of delivery	−0.03		
Step 2. Interaction effect		0.68	0.02
	Satisfaction with child progress		
Step 1. Main effects			
Pre-intervention social competence	0.47*	3.41*	0.22
Intervention mode of delivery	−0.25		
Step 2. Interaction effect		1.25	0.04
	Improvement in child difficulties		
Step 1. Main effects			
Pre-intervention child total anxiety	−0.59***	8.03**	0.37
Intervention mode of delivery	0.06		
Step 2. Interaction effect		2.26	0.05
	Improvement in child difficulties		
Step 1. Main effects		2.99+	0.18
Pre-intervention parenting restrictiveness	−0.42		
Intervention mode of delivery	0.02		
Step 2. Interaction effect		2.03	0.06

Standardized coefficients for the interaction effect step are not presented because the inclusion of this step did not improve the percentage of explained variance.

[a]Dummy-coded as: 1, yes, 0, no.

**$p < 0.01$. *$p < 0.05$. +$p < 0.10$.

total child anxiety symptoms in both intervention conditions when compared with a waiting-list condition is consistent with the findings of the pilot randomized controlled trial of the *Turtle Program* (Chronis-Tuscano et al., 2015) delivered in-person that was conducted in the USA. These findings are also in line with the main conclusions of a meta-analysis conducted by Ooi et al. (2022) concerning the effectiveness of existing in-person and online evidence-based interventions targeting inhibited preschoolers in decreasing parent-reported total anxiety symptoms.

Contrary to our hypothesis (H1), the magnitude of the decrease in parents' reports of social anxiety symptoms was only higher than in the waiting-list condition among caregivers who participated in the *Turtle Program* delivered online. This finding is inconsistent with the results of the pilot randomized controlled trial of the *Turtle Program* (Chronis-Tuscano et al., 2015) delivered in-person in the USA. The findings reported herein need to be interpreted with caution due to the small sample sizes and attrition in the completion of post-intervention measures. Nonetheless, the population-level *Cool Little Kids* dissemination trial (Bayer et al., 2018) and some of its recent adaptations (Doyle et al., 2021), delivered in-person, have also found that the decrease in mother-reported anxiety symptoms from pre- to post-intervention assessments was comparable in the intervention and control group conditions.

Children in the waiting list condition were significantly younger than children in the *Turtle Program* delivered in-person. During the preschool years, there is generally an increase in the number of naturally occurring exposures to feared social situations (Doyle et al., 2021). According to the developmental–transactional framework (Rubin et al., 2009; Rubin and Chronis-Tuscano, 2021), it is possible that family anxiety accommodation that maintains and strengthens children's difficulties is less accentuated and generalized among caregivers of younger preschoolers. Furthermore, families were recruited not only through healthcare practitioners and preschool teachers from the contact network of the research group but also through advertisements in the social networks of the research project. Doyle et al. (2021) hypothesized that caregivers in the control groups may reflect on their children's social anxiety after pre-intervention assessments, search, and apply available psychoeducational information on child social anxiety, such as those accessible in the social networks of our research project. These factors may have diluted the intervention effects of the *Turtle Program* delivered in-person. On the other hand, the *Turtle Program* delivered online included parent-child home experiences drawn on the didactic portion of the *Social Skills Facilitated Play* (Coplan et al., 2010) to enhance children's emotion-regulation and social skills. Given that they were more directly involved in the promotion of children's emotional knowledge, expression, and regulation, it is possible that parents in the *Turtle Program* delivered online were more aware of changes in children's social anxiety symptoms, such as worries about doing something embarrassing in front of other people or fearing to meet or talk to unfamiliar people.

In this study, it was also found that parents' reports of children's social adjustment in the peer group (i.e., children's abilities to

consider the perspectives of others and the demonstration of cooperation in the peer group) showed an improvement from pre- to post-intervention assessment in the *Turtle Program* delivered in-person and, to a lesser extent, in the *Turtle Program* delivered online. In the *Turtle Program* delivered in-person, group leaders facilitated free play and group activities in an equipped playroom with a group of peers with similar difficulties (Danko et al., 2018). Social play is a core developmental context during the preschool years and its quality impacts key protective factors (e.g., peer acceptance and reciprocal friendships) for healthy socioemotional outcomes (e.g., Coelho et al., 2017) among children who are behaviorally inhibited (e.g., Sette et al., 2017). In contrast, children in the *Turtle Program* delivered online mainly participated in virtual group activities (e.g., show and tell and scavenger hunt) with adults and inhibited peers. These differences between the two intervention conditions may have influenced the reported findings.

Contrary to our hypothesis (H1), improvement in perceived child social competence from pre- to post-intervention assessment was also observed in the control group. These findings are inconsistent with prior research, showing the beneficial effects of the *Turtle Program* delivered in-person (Barstead et al., 2018) and the *Social Skills Facilitated Play Program* (Coplan et al., 2010; Li et al., 2016) in children's peer interaction and prosocial behaviors when compared with a waiting-list condition. This may be explained by methodological differences between the studies. Prior studies about the *Turtle Program* delivered in-person (Barstead et al., 2018) relied on the reports of preschool teachers and trained observers in naturalistic peer play contexts. Although parents observe qualitatively different behaviors and are more familiar with children's verbal and non-verbal cues in multiple contexts, teachers observe children in daily activities with familiar peers for a significant amount of time and they develop standards of competent behaviors based on their observation of many children of similar age and their academic knowledge pertaining to child development (Fernandes et al., 2020). Given that rating scales presuppose that informants judge how a child typically behaves in comparison with others retrospectively (Fernandes et al., 2020), observational measures are frequently considered the gold standard in intervention research (Chronis-Tuscano et al., 2015; Barstead et al., 2018). Furthermore, the increase in peer play behaviors among inhibited children from waiting-list conditions has been also found in prior research (Barstead et al., 2018) and has been suggested to reflect the natural "warming up" that occurs when providing sufficient exposure over time (Rubin and Krasnor, 1980).

In line with our second research hypothesis (H2), statistically significant differences were found from pre- to post-intervention assessment in self-reported parenting nurturance in both intervention conditions when compared with the control condition. Prior research on the *Turtle Program* has been based on observational assessments of parenting behaviors during free play and structured tasks (Chronis-Tuscano et al., 2015). Although parent reports on their caregiving behaviors may be biased, our findings are consistent with prior research about the *Turtle Program* in the USA, showing a significant improvement in observed parental positive affect, sensitivity (Chronis-Tuscano et al., 2015), and positive engagement with the child during free play and structured tasks (Chronis-Tuscano et al., 2022). Furthermore, these findings are in line with the beneficial intervention effects of PCIT targeted at socially anxious children (Comer et al., 2021). Nevertheless, the magnitude of perceived changes in parental willingness to listen and share experiences with their children, and demonstrate affection, acceptance, and responsiveness toward their children's needs (Rickel and Biasatti, 1982) was greater, relative to a waiting-list, for the in-person than the online *Turtle Program*. These findings need to be interpreted with caution because pre-intervention assessment differences were identified between the in-person intervention and waiting-list conditions.

The few studies comparing clinic-based and internet-delivered PCIT indicated comparable intervention effects but were targeted at individual families with children who displayed externalizing behaviors (Comer et al., 2017). Prior research has suggested that clinic-based PCIT may provide more opportunities for therapists to build rapport with the child and to model skill use with parents, so that the parents' learning process may be lengthened (Comer et al., 2015). These additional challenges to build rapport with the child may be particularly salient with families of inhibited preschoolers who typically display increased emotional reactivity and wariness when exposed to unfamiliar adults (Fox et al., 2005). Although brief interactions with the parent–child dyads were introduced in the *Turtle Program* delivered online to counteract these potential issues (Comer et al., 2015; Cooper-Vince et al., 2016), therapist modeling is also more limited to the parent–child dyad coaching sessions than in the *Turtle Program* delivered in-person, where parents are also coached during separation and pick-up (Danko et al., 2018). This may explain why the magnitude of the differences in parenting nurturing behaviors when compared with the control group condition were lower in the *Turtle Program* delivered online.

In contrast with the second hypothesis (H2), our study did not identify significant pre- to post-intervention changes in parenting restrictiveness. Nonetheless, our findings are in line with the pilot study of Chronis-Tuscano et al. (2015) that found a lack of intervention effects in negative/intrusive control and attributed them to the characteristics of the sample (i.e., low negative control at the baseline) and the observational context. Although the internet-delivery format of the *Turtle Program* is different, the randomized controlled trial of *Cool Little Kids Online* only found small magnitude reductions in self-reported specific parenting overprotective/overinvolved behaviors that discourage autonomy in young children (Morgan et al., 2018). In our sample, parents reported parenting restrictiveness, that is, their degree of control toward children's behaviors and feelings, the establishment of narrow limits on children's behaviors, and the endorsement of strict rules, requirements, and restrictions (Rickel and Biasatti, 1982) at pre- and post-intervention assessment. Intervention changes in overprotective parenting behaviors that can increase the risk of adverse developmental pathways among inhibited preschoolers (Rubin et al., 2009; Rubin and Chronis-Tuscano, 2021) may have not been identified through parent self-reports in our study. On the other hand, parents who participate in the *Turtle Program* are taught the contributions of parenting behaviors to children's anxious behaviors and receive therapist feedback about their caregiving behaviors during child-led play and graduated exposure practice (Danko et al., 2018). Recent research on PCIT for internalizing problems has found that parents seem to

become more aware of their own caregiving behaviors and display more accurate self-perceptions of parenting at post-intervention assessment (Whalen et al., 2021). In a qualitative study, parents who participated in the *Turtle Program* delivered in-person acknowledged that they became more aware of parenting behaviors that maintained and strengthened children's inhibited behaviors at post-intervention assessment (Guedes et al., 2020). This may have influenced caregivers' self-reported parenting restrictiveness at post-intervention assessment in our sample.

Consistent with the third hypothesis (H3), parents in our sample had high session attendance, reported moderate homework completion (between 65 and 80%), and were satisfied with the progress in children's behaviors, considering that children's anxious behaviors and their ability to manage them improved after the participation in the *Turtle Program*. Parent behavioral (session attendance and homework completion) and attitudinal (satisfaction with parenting and child outcomes) engagement was comparable among parents participating in the *Turtle Program* delivered in-person and online. These findings are consistent with prior research on PCIT showing that parents who participated in clinic-based and real-time internet delivery formats reported comparable session engagement and satisfaction with the intervention (Comer et al., 2017). Perceived changes in caregivers' satisfaction as a parent after the participation in the *Turtle Program* delivered in-person and online were neutral to moderate in both intervention groups. Parental satisfaction refers to parental feelings of frustration, anxiety, and motivation in the parenting role (Johnston and Mash, 1989). Caregivers' emotions and cognitions toward children's inhibited behaviors are explored during the Bravery-Directed Interaction (BDI) phase of the *Turtle Program*, but most of the intervention activities are focused on the modification of parenting behaviors for the promotion of children's independence and SEL skills to approach anxiety-inducing situations (Danko et al., 2018). Consequently, parents may have noticed less intervention changes in their parental satisfaction than in their ability to manage children's anxious behaviors, at least immediately after their participation in the *Turtle Program*.

Consistent with the study of Novick et al. (2020), few sociodemographic correlates of parent engagement were identified in our sample. Our findings only showed that having a first-born inhibited child was associated with greater parent behavioral engagement. Previous parenting experience has been found to be associated with higher levels of parenting knowledge about childrearing and child development (Bornstein et al., 2022). This may have influenced parents' engagement in the sessions and home experiences of the developmentally grounded *Turtle Program*.

In our study, baseline child anxiety and SEL skills seemed to be the most prominent predictors of parent engagement in the *Turtle Program* delivered in-person and online. More specifically, our findings show that parents who rated their child as more socially anxious at pre-intervention assessment attended a lower number of intervention sessions. These findings are inconsistent with our hypothesis (H4) and with the study of Novick et al. (2020). In fact, Novick et al. (2020) concluded that higher levels of clinician-rated impairment due to child anxiety disorders predicted greater session attendance in the *Turtle Program* delivered in-person. These divergences in the obtained findings may be associated with methodological and informant differences. In our study, parents reported domain-specific and total anxiety symptoms. In the US study, clinicians rated global impairment due to child anxiety disorders (including separation, social, specific, and generalized anxiety disorders) (Novick et al., 2020). On the other hand, the intervention features may have influenced our findings. More specifically, the *Turtle Program* delivered in-person involves *in vivo* coaching activities with each parent–child dyad and concurrent child activities in a peer group with similar difficulties (Danko et al., 2018). Although it does not include a concurrent child group, the *Turtle Program* delivered online presupposes child involvement in parent–child *coaching* and group activities in the parent sessions. This exposure to unfamiliar adults and peers and performance situations in front of others is anxiety-inducing for inhibited preschoolers (Bishop et al., 2003), especially for children who are perceived as more socially anxious (e.g., are worried about doing something embarrassing in front of other people or are afraid to meet or talk to unfamiliar people) by their parents. When inhibited children display increased socially anxious behaviors, the developmental–transactional framework (Rubin et al., 2009; Rubin and Chronis-Tuscano, 2021) acknowledges that parents often perceive them as vulnerable, accommodate their anxiety, and engage in avoidance behaviors, refraining from encouraging them to engage in developmentally relevant social opportunities (Chronis-Tuscano et al., 2018) and, possibly, in the intervention sessions.

Our findings show that parenting nurturing behaviors predicted greater session attendance independent of the intervention mode of delivery. This is in line with our hypothesis (H4) and prior research on PCIT, showing that higher levels of positive parenting behaviors (such as parental praise) are associated with increased parent behavioral engagement in PCIT interventions (Werba et al., 2006; Fernandez and Eyberg, 2009).

Parents in our sample who reported higher levels of pre-intervention child total anxiety reported lower improvements in child difficulties. Children with higher levels of total anxiety symptoms not only display increased worries and fear in social situations but also generalized worries, physical injury fears, and difficulties during parent–child separations (Spence et al., 2001). As established in the developmental–transactional framework (Rubin et al., 2009; Rubin and Chronis-Tuscano, 2021), parents of inhibited children who display difficulties in a wider range of situations and contexts may perceive them as more vulnerable and engage in more parental control and overprotection behaviors that maintain or even exacerbate children's difficulties (Hastings et al., 2019). In the present study, it was found that baseline parenting restrictiveness is negatively correlated with perceived post-intervention improvements in child difficulties. Furthermore, the modification of child's anxious behaviors in the *Turtle Program* delivered in-person and online followed the principles of cognitive-behavioral exposure, using hierarchies of anxiety-inducing situations ("bravery ladders") and contingent social rewards for approach behaviors (Danko et al., 2018). Cognitive-behavioral exposure presupposes graduated and repeated practice across time, which requires a commitment on the part of the families beyond attending the sessions (Seligman and Ollendick,

2012). This may have been especially challenging for those families who reported that their children experience anxiety in a wide range of situations and contexts. It is possible that these families were not able to practice graduated and repeated exposure to the wide range of anxiety-inducing situations for their children, during the 8-week *Turtle Program*. This may explain why these parents perceived lower improvements in child difficulties.

With respect to child SEL skills, our findings revealed that parents who perceived that their children displayed higher levels of social competence at the pre-intervention assessment reported greater changes in post-intervention parental satisfaction and higher levels of satisfaction with child progress. Within a developmental–transactional framework (Rubin et al., 2009, 2018; Rubin and Chronis-Tuscano, 2021), children's abilities to regulate emotions, engage in a wider range of prosocial behaviors, and make good decisions about social problems have been recognized as protective factors that enhance healthy developmental pathways among inhibited preschoolers. Children's positive adaptative qualities at the pre-intervention assessment may have facilitated the practice of graduated exposure to anxiety-inducing situations within and outside the intervention sessions. When inhibited children are perceived as less vulnerable in social situations (e.g., in peer play contexts), parents may be less likely to respond to them in an overprotective, controlling, and directive manner and may be more prone to encourage children's engagement in social situations (Chronis-Tuscano et al., 2018) within and beyond the intervention sessions. Furthermore, children who display more emotionally mature and prosocial behaviors in peer play contexts may also be more likely to engage in the child didactic and group activities of the *Turtle Program* delivered in-person (Danko et al., 2018) and online. This may influence positively caregivers' satisfaction with child outcomes and changes in parenting satisfaction.

Study limitations need to be acknowledged. In the present study, the sample size at the baseline was comparable to the sample sizes observed in prior pilot randomized controlled trials conducted in clinic-based (e.g., Coplan et al., 2010; Chronis-Tuscano et al., 2015; Barstead et al., 2018) and internet-delivered interventions (e.g., Donovan and March, 2014; Comer et al., 2021) targeting inhibited and anxious preschoolers, but the attrition in the completion of post-intervention measures was higher. In line with prior research (e.g., Donovan and March, 2014; Chronis-Tuscano et al., 2015; Comer et al., 2021), we found significant and sizeable pre- to post-intervention changes in child anxiety symptoms and parenting nurturing behaviors in the intervention conditions when compared with a waiting list condition using GEE. Nevertheless, the small sample size and the attrition in the completion of post-intervention assessments may have underpowered the detection of between-group differences in child prosocial behaviors that were found in prior studies (Coplan et al., 2010; Barstead et al., 2018) and the detection of moderation effects of intervention mode of delivery in parent engagement. In fact, *post-hoc* power calculations indicated that large effects could be detected. Even if both intervention groups did not differ significantly in terms of baseline characteristics, we cannot ignore that the delivery of the *Turtle Program* in-person and online took place at different time intervals. More specifically, the *Turtle Program* was delivered online during the second, third, and fourth waves of the COVID-19 pandemic crisis. The real-time internet delivery of the *Turtle Program* allowed us to reach parents from other Portuguese regions who would not be able to attend the intervention delivered in-person conducted in the Metropolitan Lisbon area. Nevertheless, the timing during which the online *Turtle Program* was delivered and the percentage of the Portuguese population aged 16–74 years who display digital literacy skills classified as basic and beyond (Eurostat, 2022) may have influenced both perceived intervention outcomes and parental engagement. Although we assessed both positive and negative domains of child and parental functioning, our findings reflected the perspectives of parents (mostly mothers) using validated rating scales, self-report questionnaires, and specific items (e.g., satisfaction with child and parenting outcomes) developed by the research group who developed the *Turtle Program* (Novick et al., 2020). Maternal ratings about children's behaviors may be influenced by memory bias, as well as by maternal knowledge and beliefs toward the assessed behaviors (Fernandes et al., 2020). Furthermore, mothers' ability to report their own parenting behaviors may be influenced by social desirability biases, leading mothers to under-report negative behaviors while overreporting positive behaviors (Whalen et al., 2021). Although the COVID-19 crisis negatively impacted the conduction of in-person assessments, the absence of observational measures of child BI and parenting behaviors in the present study is noteworthy. Despite its limitations, this is the first preliminary study to examine pre-post intervention changes in child and parenting functioning in the *Turtle Program* delivered in-person and online when compared with a waiting-list condition. The findings of our study are encouraging that the *Turtle Program* could be delivered in-person and online in a cultural context different from the venue within which the intervention was developed (the USA). Future randomized controlled trials with diverse active control groups (e.g., in-person parent-only or child-only interventions and self-administered internet-delivery interventions) should be conducted. These trials need to include larger samples with more diverse sociodemographic characteristics, use a multi-informant (e.g., parents, teachers, and trained observers) and multi-method (e.g., observations of parenting and child social behaviors, questionnaires, and diagnostic interviews) approach, and introduce follow-up assessments to better understand the long-term effects of the intervention. This may allow for the examination of mediators or moderators of the intervention effects, depending on the intervention mode of delivery. Deepening the understanding of parent engagement and its predictors requires a more comprehensive measurement of both behavioral and attitudinal components (e.g., weekly homework completion and satisfaction), the inclusion of other parent-level factors (e.g., parental stress, mental health diagnoses, and beliefs about child inhibited behaviors) and the examination of the interaction between child and parent-level factors. This may guide the development of add-on motivational modules to enhance parent engagement and, ultimately, intervention effectiveness.

Overall, in line with a transactional–developmental framework (Rubin et al., 2009; Rubin and Chronis-Tuscano, 2021), our findings provide further evidence of the beneficial effects of early multimodal interventions targeted at BI to reduce parent-reported child anxiety symptoms and promote nurturing parenting behaviors that can place inhibited preschoolers in healthier

developmental pathways. The promising beneficial effects of the therapist-guided online *Turtle Program* extend the current state-of-the-art knowledge and need to be further investigated. In fact, this type of internet-delivered intervention program targeted at inhibited preschoolers has the potential to maximize intervention cost-effectiveness and to minimize barriers to intervention adherence and persistence among families who live in areas with limited access to mental health services and/or experience attendance difficulties due to diverse factors (e.g., scheduling of the sessions, transportation issues, and siblings' childcare arrangements).

Our findings also appear to highlight the importance of a multi-domain developmental assessment before the intervention to understand children's difficulties and identify individual protective factors (namely, children's SEL skills) against unhealthy developmental outcomes. This assessment can guide the design of evidence-based motivational strategies that can enhance parent engagement in multimodal intervention programs targeted at BI delivered in-person and online. More specifically, a greater focus on psychoeducation about the parenting behaviors (e.g., parenting accommodation and avoidance of social situations) that maintain BI and on the cognitive restructuring of unrealistic expectations for immediate changes in children's behaviors may be needed for parents who perceive that their inhibited children display more anxiety symptoms and less SEL skills at the baseline.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Ethics statement

The studies involving human participants were reviewed and approved by Comissão de ética do ISPA. Written informed consent to participate in this study was provided by the participants' legal guardian/next of kin.

Author contributions

MG, AS, MV, AC-T, and KR contributed to conception and design of the study. MG, RM, IM, MA, and TR collected the data. MG performed the statistical analysis and wrote the first draft of the manuscript. All authors contributed to manuscript revision, read, and approved the submitted version.

Funding

This work was supported by Gulbenkian Foundation (Grant/Award Number: Process Number 222926) and by the Portuguese Foundation for Science and Technology (UIDB/04810/2020). MG was supported by a post-doctoral fellowship (SFRH/BPD/114846/2016) and is currently supported by a junior researcher contract (2020.01755.CEECIND) from the Portuguese Foundation for Science and Technology.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Publisher's note

All claims expressed in this article are solely those of the authors and do not necessarily represent those of their affiliated organizations, or those of the publisher, the editors and the reviewers. Any product that may be evaluated in this article, or claim that may be made by its manufacturer, is not guaranteed or endorsed by the publisher.

References

Aiken, L. S., and West, S. G. (1991). *Multiple Regression: Testing and Interpreting Interactions*. Newbury Park, CA: Sage.

Albano, A., and Silverman, W. (1996). *Anxiety Disorders Interview Schedule for DSM-IV. Clinician Manual*. Oxford, UK: Graywind.

Almeida, J. P., and Viana, V. (2013). Adaptação da escala de ansiedade pré-escolar, de S. Spence. *Psicol. Saúde Doenças* 14, 470–483. doi: 10.15309/13psd140308

Andersson, H. W., and Sommerfelt, K. (2001). The relationship between cognitive abilities and maternal ratings of externalizing behaviors in preschool children. *Scand. J. Psychol.* 42, 437–444. doi: 10.1111/1467-9450.00256

Barnett, M. L., and Niec, L. N. (2018). "Group PCIT: increasing access and leveraging positive parent pressure," in *The Handbook of Parent-Child Interaction Therapy: Innovations and Applications for Research and Practice*, ed L. N Niec (Cham: Springer Nature), 151–160.

Barstead, M. G., Danko, C. M., Chronis-Tuscano, A., O'Brien, K. A., Coplan, R. J., and Rubin, K. H. (2018). Generalization of early intervention for inhibited preschoolers to the classroom setting. *J. Child Fam. Stud.* 27, 2943–2953. doi: 10.1007/s10826-018-1142-0

Bayer, J. K., Beatson, R., Bretherton, L., Hiscock, H., Wake, M., Gilbertson, T., et al. (2018). Translational delivery of Cool Little Kids to prevent child internalising problems: Randomised controlled trial. *Aust. N. Z. Psychiatr.* 52, 181–191. doi: 10.1177/0004867417726582

Bayer, J. K., Prendergast, L. A., Brown, A., Harris, L., Bretherton, L., Hiscock, H., et al. (2021). Cool Little Kids translational trial to prevent internalising: two-year outcomes and prediction of parent engagement. *Child Adol. Ment. Health* 26, 211–219. doi: 10.1111/camh.12420

Bishop, G., Spence, S. H., and McDonald, C. (2003). Can parents and teachers provide a reliable and valid report of behavioral inhibition? *Child Dev.* 74, 1899–1917. doi: 10.1046/j.1467-8624.2003.00645.x

Bornstein, M. H., Cote, L. R., Haynes, M., Hahn, C. -H., and Park, Y. (2022). "Parenting knowledge: Experiential and sociodemographic sactors in European American mothers of young children," in *Parenting: Selected Writings of Marc H. Bornstein*, ed M. H. Bornstein (Routledge), 195–230.

Chronis-Tuscano, A., Danko, C. M., Rubin, K. H., Coplan, R. J., and Novick, D. R. (2018). Future directions for research on early intervention for young children at risk for social anxiety. *J. Clin. Child Psychol.* 47, 655–667. doi: 10.1080/15374416.2018.1426006

Chronis-Tuscano, A., Degnan, K. A., Pine, D. S., Perez-Edgar, K., Henderson, H. A., Diaz, Y., et al. (2009). Stable early maternal report of behavioral inhibition predicts

lifetime social anxiety disorder in adolescence. *J. Am. Acad. Child Adol. Psych.* 48, 928–935. doi: 10.1097/CHI.0b013e3181ae09df

Chronis-Tuscano, A., Novick, D. R., Danko, C. M., Smith, K. A., Wagner, N. J., Wang, C. H., et al. (2022). Early intervention for inhibited young children: a randomized controlled trial comparing the Turtle Program and Cool Little Kids. *J. Child. Psychol. Psych.* 63, 273–281. doi: 10.1111/jcpp.13475

Chronis-Tuscano, A., Rubin, K. H., O'Brien, K. A., Coplan, R. J., Thomas, S. R., Dougherty, L. R., et al. (2015). Preliminary evaluation of a multimodal early intervention program for behaviorally inhibited preschoolers. *J. Consult. Clin. Psych.* 83, 534–540. doi: 10.1037/a0039043

Coelho, L., Torres, N., Fernandes, C., and Santos, A. J. (2017). Quality of play, social acceptance, and reciprocal friendship in preschool children. *Eur. Early Child. Educ. Res. J.* 25, 812–823. doi: 10.1080/1350293X.2017.1380879

Comer, J. S. (2021). Rebooting mental health care delivery for the COVID-19 pandemic (and beyond): guiding cautions as telehealth enters the clinical mainstream. *Cogn. Behav. Pract.* 28, 743–748. doi: 10.1016/j.cbpra.2021.09.002

Comer, J. S., del Busto, C., Dick, A. S., Furr, J. M., and Puliafico, A. C. (2018). "Adapting PCIT to treat anxiety in young children: The PCIT CALM program," in *The Handbook of Parent-Child Interaction Therapy: Innovations and Applications for Research and Practice*, ed L. N Niec (Cham: Springer Nature), 129–147.

Comer, J. S., Furr, J. M., Cooper-Vince, C., Madigan, R. J., Chow, C., Chan, P. T., et al. (2015). Rationale and considerations for the internet-based delivery of parent–child interaction therapy. *Cogn. Behav. Pract.* 22, 302–316. doi: 10.1016/j.cbpra.2014.07.003

Comer, J. S., Furr, J. M., Del Busto, C., Silva, K., Hong, N., Poznanski, B., et al. (2021). Therapist-led, internet-delivered treatment for early child social anxiety: a waitlist-controlled evaluation of the iCALM telehealth program. *Behav. Ther.* 52, 1171–1187. doi: 10.1016/j.beth.2021.01.004

Comer, J. S., Furr, J. M., Miguel, E. M., Cooper-Vince, C. E., Carpenter, A. L., Elkins, R. M., et al. (2017). Remotely delivering real-time parent training to the home: an initial randomized trial of Internet-delivered parent–child interaction therapy (I-PCIT). *J. Consult. Clin. Psych.* 85, 909–917. doi: 10.1037/ccp0000230

Cooper-Vince, C. E., Chou, T., Furr, J. M., Puliafico, A. C., and Comer, J. S. (2016). Videoteleconferencing early child anxiety treatment: a case study of the internet-delivered PCIT CALM (I-CALM) program. *Evid. Based Pract. Child. Adol. Ment. Health* 1, 24–39. doi: 10.1080/23794925.2016.1191976

Coplan, R. J. (2020). "Play skills for shy preschoolers: a social skills training and facilitated play (SST-FP) early intervention program," in *Social Skills Across the Life Span*, eds D. W Douglas, C. A. Erdley, and R. A. Schwartz-Mette (London: Academic Press), 165–179.

Coplan, R. J., Schneider, B. H., Matheson, A., and Graham, A. (2010). 'Play skills' for shy children: development of a social skills facilitated play early intervention program for extremely inhibited preschoolers. *Infant Child Dev.* 19, 223–237. doi: 10.1002/icd.668

Danko, C. M., O'Brien, K. A., Rubin, K. H., and Chronis-Tuscano, A. (2018). "The Turtle Program: PCIT for young children displaying behavioral inhibition," in *The Handbook of parent-child interaction therapy: Innovations and applications for research and practice*, ed L. N. Niec (Cham: Springer Nature), 85–98.

Denham, S. A., and Brown, C. (2010). "Plays nice with others": Social-emotional learning and academic success. *Early Educ. Dev.* 21, 652–680. doi: 10.1080/10409289.2010.497450

Donovan, C. L., and March, S. (2014). Online CBT for preschool anxiety disorders: a randomised control trial. *Behav. Res. Ther.* 58, 24–35. doi: 10.1016/j.brat.2014.05.001

Doyle, F. L., Dodd, H. F., Morris, T. M., Lazarus, R. S., Byrow, Y., and Hudson, J. L. (2021). Targeting risk factors for inhibited preschool children: an anxiety prevention program. *Behav. Res. Ther.* 147, 103982. doi: 10.1016/j.brat.2021.103982

Eurostat (2022). *Share of Individuals Having at Least Basic Digital Skills, by Sex (2015–2022)*. Available online at: https://ec.europa.eu/eurostat/databrowser/product/view/ISOC_SK_DSKL_I (accessed April 24, 2022).

Eyberg, S. M., Nelson, M. M., and Boggs, S. R. (2008). Evidence-based psychosocial treatments for children and adolescents with disruptive behavior. *J. Clin. Child. Adol. Psychol.* 37, 215–237. doi: 10.1080/15374410701820117

Faul, F., Erdfelder, E., Buchner, A., and Lang, A.-G. (2009). Statistical power analyses using G*Power 3.1: tests for correlation and regression analyses. *Behav. Res. Methods* 41, 1149–1160. doi: 10.3758/BRM.41.4.1149

Faul, F., Erdfelder, E., and Lang, A. G. (2007). G-Power3: A flexible statistical power analysis program for the social, behavioural, and biomedical sciences. *Behav. Res. Methods* 39, 175–191. doi: 10.3758/BF03193146

Fernandes, C., Santa-Rita, A., Martins, A. T., and Faísca, L. (2017). Portuguese adaptation of the Behavioral Inhibition Questionnaire: Preliminary report of the psychometric characteristics of the BIQ.

Fernandes, M., Santos, A. J., Antunes, M., Fernandes, C., Monteiro, L., Vaughn, B. E., et al. (2020). Convergent and discriminant validities of SCBE-30 questionnaire using correlated trait–correlated method Minus One. *Front. Psychol.* 11, 571792. doi: 10.3389/fpsyg.2020.571792

Fernandez, M. A., and Eyberg, S. M. (2009). Predicting treatment and follow-up attrition in parent–child interaction therapy. *J. Abnorm. Child Psychol.* 37, 431–441. doi: 10.1007/s10802-008-9281-1

Fox, N. A., Henderson, H. A., Marshall, P. J., Nichols, K. E., and Ghera, M. M. (2005). Behavioral inhibition: linking biology and behavior within a developmental framework. *Annu. Rev. Psychol.* 56, 235–262. doi: 10.1146/annurev.psych.55.090902.141532

Fox, N. A., Zeytinoglu, S., Valadez, E. A., Buzzell, G. A., Morales, S., Henderson, H. A. (2023). Annual Research Review: Developmental pathways linking early behavioral inhibition to later anxiety. *J. Child Psychol. Psych.* 64, 537–561. doi: 10.1111/jcpp.13702

Gonzales, N. A., Lau, A. S., Murry, V. M., Pina, A. A., and Barrera, M. Jr. (2016). "Culturally adapted preventive interventions for children and adolescents". in *Developmental psychopathology: Risk, resilience, and intervention*, ed D. Cicchetti (New York, NY: John Wiley & Sons, Inc.), 874–933.

Guedes, M., Alves, S., Santos, A., Veríssimo, M., Chronis-Tuscano, A., Danko, C., et al. (2019a). Perceptions of Portuguese psychologists about the acceptability of a child intervention targeted at inhibited preschoolers. *Anál. Psicol.* 37, 371–390. doi: 10.14417/ap.1525

Guedes, M., Coelho, L., Santos, A. J., Veríssimo, M., Rubin, K. H., Danko, C., et al. (2019b). Perceptions of Portuguese psychologists about the acceptability of a parent intervention targeted at inhibited preschoolers. *Evid. Based Pract. Child Adolesc. Mental Health* 4, 1–17. doi: 10.1080/23794925.2018.1555443

Guedes, M., Matos, I., Almeida, T., Freitas, M., Alves, S., Santos, A. J., et al. (2020). "Perceções das famílias portuguesas acerca do impacto da participaćão no Turtle Program," in *Atas do 13° Congresso de Psicologia da Saúde*, eds H. Pereira, S. Monteiro, G. Esgalhado, A. Cunha, and I. Leal (Lisbon: ISPA), 599–608

Guedes, M., Matos, I., Almeida, T., Freitas, M., Alves, S., Santos, A. J., et al. (2021). Perceptions of Portuguese parents about the acceptability of a multicomponent intervention targeted at behavioral inhibition during early childhood. *Infant Ment. Health J.* 42, 263–278. doi: 10.1002/imhj.21900

Hane, A. A., Cheah, C., Rubin, K. H., and Fox, N. A. (2008). The role of maternal behavior in the relation between shyness and social reticence in early childhood and social withdrawal in middle childhood. *Soc. Dev.* 17, 795–811. doi: 10.1111/j.1467-9507.2008.00481.x

Hastings, P. D., Rubin, K. H., Smith, K. A., and Wagner, N. (2019). "Parenting behaviorally inhibited and socially withdrawn children," in *The Handbook of Parenting*, ed M. Bornstein (New York, NY: Routledge), 33–52.

Hastings, P. D., Sullivan, C., McShane, K. E., Coplan, R. J., Utendale, W. T., and Vyncke, J. D. (2008). Parental socialization, vagal regulation, and preschoolers' anxious difficulties: direct mothers and moderated fathers. *Child. Dev.* 79, 45–64. doi: 10.1111/j.1467-8624.2007.01110.x

Hedges, L. V. (1981). Distribution theory for Glass's estimator of effect size and related estimators. *J. Educ. Stat.* 6, 107–128. doi: 10.3102/10769986006002107

Hong, N., Herrera, A., Furr, J. M., Georgiadis, C., Cristello, J., Heymann, P., et al. (2022). Remote intensive group behavioral treatment for families of children with selective mutism. *Evid. Based Pract. Child Adol. Ment. Health* 1–20. doi: 10.1080/23794925.2022.2062688

Johnston, C., and Mash, E. J. (1989). A measure of parenting satisfaction and efficacy. *J. Clin. Child Psychol.* 18, 167–175. doi: 10.1207/s15374424jccp1802_8

Kennedy, S. J., Rapee, R. M., and Edwards, S. L. (2009). A selective intervention program for inhibited preschool-aged children of parents with an anxiety disorder: Effects on current anxiety disorders and temperament. *J. Am. Acad. Child Adolesc. Psychiatr.* 48, 602–609.

Kim, J., Klein, D. N., Olino, T. M., Dyson, M. W., Dougherty, L. R., and Durbin, C. E. (2011). Psychometric properties of the Behavioral Inhibition Questionnaire in preschool children. *J. Pers. Assess.* 93, 545–555. doi: 10.1080/00223891.2011.608756

LaFreniere, P., Masataka, N., Butovskaya, M., Chen, Q., Auxiliadora Dessen, M., Atwanger, K., et al. (2002). Cross-cultural analysis of social competence and behavior problems in preschoolers. *Early Educ. Dev.* 13, 201–220. doi: 10.1207/s15566935eed1302_6

LaFreniere, P. J., and Dumas, J. E. (1996). Social competence and behavior evaluation in children ages 3 to 6 years: the short form (SCBE-30). *Psychol. Assess.* 8, 369–377. doi: 10.1037/1040-3590.8.4.369

Lau, E. X., Rapee, R. M., and Coplan, R. J. (2017). Combining child social skills training with a parent early intervention program for inhibited preschool children. *J. Anxiety Disord.* 51, 32–38. doi: 10.1016/j.janxdis.2017.08.007

Lewis-Morrarty, E., Degnan, K. A., Chronis-Tuscano, A., Rubin, K. H., Cheah, C. S., Pine, D. S., et al. (2012). Maternal over-control moderates the association between early childhood behavioral inhibition and adolescent social anxiety symptoms. *J. Abnorm. Child Psychol.* 40, 1363–1373. doi: 10.1007/s10802-012-9663-2

Li, Y., Coplan, R. J., Wang, Y., Yin, J., Zhu, J., Gao, Z., et al. (2016). Preliminary evaluation of a social skills training and facilitated play early intervention programme for extremely shy young children in China. *Inf. Child. Dev.* 25, 565–574.doi: 10.1002/icd.1959

Mernick, B., Pine, A., Gendler, T., and Shechner, T. (2018). A psychometric evaluation of the behavioral inhibition questionnaire in a non-clinical sample of Israeli children and adolescents. *J. Child Fam. Stud.* 27, 1794–1804. doi: 10.1007/s10826-018-1027-2

Morgan, A. J., Rapee, R. M., and Bayer, J. K. (2016). Prevention and early intervention of anxiety problems in young children: a pilot evaluation of Cool Little Kids Online. *Int. Interv.* 4, 105–112. doi: 10.1016/j.invent.2016.05.001

Morgan, A. J., Rapee, R. M., Salim, A., and Bayer, J. K. (2018). Predicting response to an internet-delivered parenting program for anxiety in early childhood. *Behav. Ther.* 49, 237–248. doi: 10.1016/j.beth.2017.07.009

Morgan, A. J., Rapee, R. M., Salim, A., Goharpey, N., Tamir, E., McLellan, L. F., et al. (2017). Internet-delivered parenting program for prevention and early intervention of anxiety problems in young children: randomized controlled trial. *J. Am. Acad. Child Adol. Psych.* 56, 417–425. doi: 10.1016/j.jaac.2017.02.010

Muris, P., and Ollendick, T. H. (2021). Selective mutism and its relations to social anxiety disorder and autism spectrum disorder. *Clin. Child Fam. Psychol. Rev.* 24, 294–325. doi: 10.1007/s10567-020-00342-0

Novick, D. R., Smith, K. A., Barstead, M. G., Danko, C. M., Rubin, K. H., Druskin, L., et al. (2020). Predictors and moderators of parent engagement in early interventions for behaviorally inhibited preschool-aged children. *Evid. Based Pract. Child Adol. Ment. Health* 5, 452–467. doi: 10.1080/23794925.2020.1784060

Ooi, J., Dodd, H. F., Meiser-Stedman, R., Hudson, J. L., Bridges, J., and Pass, L. (2022). The efficacy of interventions for behaviourally inhibited preschool-aged children: a meta-analysis. *J. Anxiety Disord.* 88, 102559. doi: 10.1016/j.janxdis.2022.102559

Orgilés, M., Penosa, P., Fernández-Martínez, I., Marzo, J. C., and Espada, J. P. (2018). Spanish validation of the Spence Preschool Anxiety Scale. *Child Care Health Dev.* 44, 753–758. doi: 10.1111/cch.12593

Pincus, D. B., Eyberg, S. M., and Choate, M. L. (2005). "Adapting parent-child interaction therapy for young children with separation anxiety disorder," in *Education and Treatment of Children*. p. 163–181.

Rapee, R. M., Kennedy, S. J., Ingram, M., Edwards, S. L., and Sweeney, L. (2010). Altering the trajectory of anxiety in at-risk young children. *Am. J Psych.* 16, 1518–1525. doi: 10.1176/appi.ajp.2010.09111619

Ribeiro, O., Guedes, M., Veríssimo, M., Rubin, K., and Santos, A. J. (2021). Multidimensional factor structure of the modified child rearing practices report questionnaire (CRPR-Q) in a sample of Portuguese mothers: a bifactor approach. *An. Psicol.* 39, 299–311. doi: 10.14417/ap.1688

Rickel, A. U., and Biasatti, L. L. (1982). Modification of the block child rearing practices report. *J. Clin. Psychol.* 38, 129–134. doi: 10.1002/1097-4679(198201)38:1<129::AID-JCLP2270380120>3.0.CO;2-3

Rubin, K. H., Barstead, M. G., Smith, K. A., and Bowker, J. C. (2018). "Peer relations and the behaviorally inhibited child," in *The Behavioral Inhibition: Integrating Theory, Research, and Clinical Perspectives*, eds K. Pérez-Edgar, and N. A. Fox (Cham: Springer Nature), 157–184.

Rubin, K. H., Burgess, K. B., and Hastings, P. D. (2002). Stability and social–behavioral consequences of toddlers' inhibited temperament and parenting behaviors. *Child Dev.* 53, 483–495. doi: 10.1111/1467-8624.00419

Rubin, K. H., and Chronis-Tuscano, A. (2021). Perspectives on social withdrawal in childhood: past, present, and prospects. *Child Dev. Perspect.* 15, 160–167. doi: 10.1111/cdep.12417

Rubin, K. H., Coplan, R. J., and Bowker, J. C. (2009). Social withdrawal in childhood. *Annu. Rev. Psychol.* 60, 141–171. doi: 10.1146/annurev.psych.60.110707.163642

Rubin, K. H., and Krasnor, L. R. (1980). Changes in the play behaviors of preschoolers: a short-term longitudinal investigation. *Can. J. Behav. Sci.* 12, 278–282. doi: 10.1037/h0081066

Russo, V., Marques, T., Pereira, A. I., and Barros, L. (2011). "Avaliação de perturbações de ansiedade com recurso a uma entrevista diagnóstica: A versão portuguesa para pais da ADIS-IV (Anxiety Disorder Interview Schedule for Children)," in *The Atas do VIII Congresso Ibero-Americano de Avaliação/Evaluación Psicológica*, eds A. S. Ferreira, A. Verhaeghe, D. R. Silva, L. S. Almeida, R. Lima, and S. Fraga (Lisbon: Sociedade Portuguesa de Psicologia), 1532–1546.

Ryan, S. M., and Ollendick, T. H. (2018). The interaction between child behavioral inhibition and parenting behaviors: Effects on internalizing and externalizing symptomology. *Clin. Child Fam. Psychol. Rev.* 21, 320–339. doi: 10.1007/s10567-018-0254-9

Sandstrom, A., Uher, R., and Pavlova, B. (2020). Prospective association between childhood behavioral inhibition and anxiety: a meta-analysis. *Res. Child Adol. Psychopathol.* 48, 57–66. doi: 10.1007/s10802-019-00588-5

Schulz, K. F., Altman, D. G., Moher, D., and CONSORT Group. (2010). CONSORT 2010 statement: updated guidelines for reporting parallel group randomized trials. *Ann. Intern. Med.* 152, 726–732. doi: 10.7326/0003-4819-152-11-201006010-00232

Seligman, L. D., and Ollendick, T. H. (2012). Cognitive-behavioral therapy for anxiety disorders in youth. *Child Adol. Psych. Clin. N. Am.* 20, 217–238. doi: 10.1016/j.chc.2011.01.003

Sette, S., Zava, F., Baumgartner, E., Baiocco, R., and Coplan, R. J. (2017). Shyness, unsociability, and socio-emotional functioning at preschool: the protective role of peer acceptance. *J. Child Fam. Stud.* 26, 1196–1205.doi: 10.1037/spq0000179

Silverman, W. K., and Ollendick, T. H. (2005). Evidence-based assessment of anxiety and its disorders in children and adolescents. *J. Clin. Child Adol. Psychol.* 34, 380–411. doi: 10.1207/s15374424jccp3403_2

Smith, K. A., Hastings, P. D., Henderson, H. A., and Rubin, K. H. (2019). Multidimensional emotion regulation moderates the relation between behavioral inhibition at age 2 and social reticence with unfamiliar peers at age 4. *J. Abnorm. Child Psychol.* 47, 1239–1251. doi: 10.1007/s10802-018-00509-y

Spence, S. H., Rapee, R., McDonald, C., and Ingram, M. (2001). The structure of anxiety symptoms among preschoolers. *Behav. Res. Ther.* 39, 1293–1316. doi: 10.1016/S0005-7967(00)00098-X

Tabachnick, B. G., and Fidell, L. S. (2007). *Using Multivariate Statistics, 5th Edn.* Boston, MA: Pearson.

Werba, B. E., Eyberg, S. M., Boggs, S. R., and Algina, J. (2006). Predicting outcome in parent-child interaction therapy: success and attrition. *Behav. Modif.* 30, 618–646. doi: 10.1177/0145445504272977

Whalen, D. J., Gilbert, K. E., and Luby, J. L. (2021). Changes in self-reported and observed parenting following a randomized control trial of parent–child interaction therapy for the treatment of preschool depression. *J. Child Psychol. Psych.* 62, 86–96. doi: 10.1111/jcpp.13263

Woolfson, L., and Grant, F. (2006). Authoritative parenting and parental stress in parents of preschool and older children with developmental disabilities. *Child Care Health Dev.* 32, 177–184. doi: 10.1111/j.1365-2214.2006.00603.x

Xiong, P., Liu, M., Liu, B., and Hall, B. J. (2022). Trends in the incidence and DALYs of anxiety disorders at the global, regional, and national levels: Estimates from the Global Burden of Disease Study 2019. *J. Affect. Disord.* 297, 83–93. doi: 10.1016/j.jad.2021.10.022

frontiers | Frontiers in Psychology

TYPE Methods
PUBLISHED 17 July 2023
DOI 10.3389/fpsyg.2023.1213293

OPEN ACCESS

EDITED BY
Pedro Rosário,
University of Minho, Portugal

REVIEWED BY
Vítor Gamboa,
University of Algarve, Portugal
Maura Pilotti,
Prince Mohammad bin Fahd University,
Saudi Arabia

*CORRESPONDENCE
Rita Francisco
ritafrancisco@ucp.pt

RECEIVED 27 April 2023
ACCEPTED 03 July 2023
PUBLISHED 17 July 2023

CITATION
Francisco R, Raposo B, Hormigo M, Sesifredo M, Carvalho A, Justo A and Godinho CA (2023) #EntreViagenseAprendizagens: study protocol of a school-based intervention to promote well-being and healthy lifestyles among adolescents.
Front. Psychol. 14:1213293.
doi: 10.3389/fpsyg.2023.1213293

#EntreViagenseAprendizagens: study protocol of a school-based intervention to promote well-being and healthy lifestyles among adolescents

Rita Francisco[1,2]*, Beatriz Raposo[1], Mafalda Hormigo[1], Mónica Sesifredo[1], Ana Carvalho[1], Ana Justo[2] and Cristina Albuquerque Godinho[1,3]

[1]Católica Research Centre for Psychological - Family and Social Wellbeing (CRC-W), Universidade Católica Portuguesa, Lisbon, Portugal, [2]School of Human Sciences, Universidade Católica Portuguesa, Lisbon, Portugal, [3]NOVA National School of Public Health, Public Health Research Centre, Comprehensive Health Research Center (CHRC), NOVA University Lisbon, Lisbon, Portugal

Background: Adolescence is a critical period of development in which well-being usually decreases, mental health problems (e.g., depression, anxiety) increase, and lifestyles become less healthy. Schools are a primary setting for the promotion of the well-being and overall health of adolescents, and preventive actions should be a priority within the scope of health-promoting schools. #EntreViagenseAprendizagens is a school-based intervention aiming to promote well-being and healthy lifestyles among adolescents based on social and emotional learning, positive psychology, and health education approaches.

Methods: This protocol describes a school-based intervention, #EntreViagenseAprendizagens, that will be implemented in several schools in Portugal. The program is aimed at 8th and 9th grade students (14–16 years old) and comprises 20 weekly sessions. One of the sessions is aimed at the students' parents/guardians. The intervention content targets social and emotional skills, health literacy (physical and mental health), healthy lifestyles, character strengths, and well-being. An experimental design will be used in the intervention evaluation. Eighth grade classes will be randomly assigned to the intervention group or the control group. All students complete the same assessment protocol at baseline, post-intervention, and 9-month follow-up. The impact assessment protocol includes measures related to well-being, health literacy, health-related knowledge, attitudes and behaviors, relationships with others, social and emotional skills, and sociodemographic data. Process evaluation includes evaluation forms at the end of each session and at the end of the program and focus groups with students, parents, and teachers at the end of the program.

Discussion: This school-based intervention may play an important role in promoting students' well-being and in preventing unhealthy lifestyles and socio-emotional maladjustment, by focusing on the development of social and emotional skills and health literacy among adolescents, empowering them to face the changing future and grow up healthy. Furthermore, this project aims to provide relevant scientific findings that can contribute to the development of better health-promoting schools.

KEYWORDS

well-being, healthy lifestyles, social and emotional skills, school-based intervention, adolescents, experimental design, protocol

1. Introduction

In their work on health-promoting schools, World Health Organization and United Nations Educational, Scientific and Cultural Organization (2021), have stressed that preventive actions should be, more than ever, a priority for schools, in order to foster the well-being and overall health of children and adolescents in a safe learning environment. Although the relationship between well-being, physical health, and mental health is well-established, prevention programs implemented in school settings tend to focus on only one of these three dimensions, particularly in Portugal. Therefore, a school-based intervention named #EntreViagenseAprendizagens was developed to promote well-being and healthy lifestyles among adolescents based on social and emotional learning, positive psychology, and health education approaches. This study protocol aims to describe the research design and methodology of #EntreViagenseAprendizagens.

1.1. Health, well-being, and lifestyles during adolescence

Adolescence is a critical period of development in which well-being usually decreases (e.g., Hendriks et al., 2020; Orben et al., 2022), mental health problems (e.g., depression, anxiety, behavioral problems) increase (e.g., Leadbeater et al., 2012; Frey et al., 2020), and lifestyles become less healthy (e.g., Gunnell et al., 2016; Irvine et al., 2022), with significant implications during adulthood (e.g., Frech, 2012; Velten et al., 2018).

The relationship between lifestyles, physical health and mental health has been clearly identified in the literature, particularly among adolescents, as the Health Behavior in School-aged Children (HBSC) studies have shown (e.g., Marques et al., 2019). For example, the longitudinal study developed by Gunnell et al. (2016) found that higher psychopathology symptoms were associated with more screen time and less physical activity, and that higher initial symptoms of depression predicted greater decreases in physical activity during adolescence. Also, Ames and Leadbeater (2018) identified different developmental trajectories from adolescence to young adulthood, which relate to depressive symptoms and specific indicators of health (such as subjective health and health-promoting or health-risk behaviors) that may help explain the risk of cardiovascular diseases.

Considering that the concepts of well-being and mental health are distinct, it is important to note that adolescent well-being is multidimensional, incorporating both positive aspects (e.g., happiness, engagement) and aspects of ill-being (e.g., depressed mood, feelings of stress) of one's life (Jarden et al., 2021). Moreover, adolescent well-being is related to different outcomes, such as school engagement, school achievement, life satisfaction, hope, gratitude, physical vitality, and physical activity (Seligman et al., 2009; Kern et al., 2015).

More recent perspectives consider adolescent well-being to be an even broader concept, viewing it as a personal and societal good in its own right: "adolescents have the support, confidence, and resources to thrive in contexts of secure and healthy relationships, realizing their full potential and rights" (Ross et al., 2020, p. 473). The authors propose five interconnected domains that contribute to adolescent well-being and comprise both subjective and objective constructs, including good health, connectedness and contribution to society, education, and agency and resilience.

This conceptual framework for adolescent well-being is consistent with—and underlies—the concept of health-promoting school—"a school that constantly strengthens its capacity as a safe and healthy setting for living, learning and working" (World Health Organization and United Nations Educational, Scientific and Cultural Organization, 2021, p. 1). Despite schools being a privileged setting to improve the health and well-being of students, school-based interventions should also aim to reduce or prevent pathology and problem behaviors (e.g., depression, alcohol use, bullying; American Psychological Association, 2023).

Grounded in this framework, the program #EntreViagenseAprendizagens was developed as a school-based intervention aimed at promoting the overall well-being of adolescents and their positive and healthy development, based on social and emotional learning, health literacy and healthy lifestyles promotion, and positive psychology interventions.

1.2. Scientific-based approaches to the promotion of adolescents' health and well-being

1.2.1. Social and emotional learning

The Social and Emotional Learning (SEL) framework was proposed in 1994 by the Collaborative for Academic, Social, and Emotional Learning (CASEL, 2023), with the aim of establishing SEL as an integral part of education in the school context, based on scientific evidence. School-based SEL interventions involve implementing practices and policies that help students and adults "acquire and apply knowledge, skills, and attitudes to develop healthy identities, manage emotions and achieve personal and collective goals, feel and show empathy for others, establish and maintain supportive relationships, and make responsible and caring decisions" (CASEL, 2020). This occurs through the promotion of a diversity of social and emotional skills, which can be grouped into five major domains, including a variety of thoughts, attitudes, and behaviors: self-awareness (e.g., identifying and understanding one's emotions), self-management (e.g., identifying and using stress-management strategies), social awareness (e.g., demonstrating empathy and compassion), relationship skills (e.g., communicating effectively), and responsible decision-making (e.g., identifying solutions for personal and social problems).

Different studies have developed meta-analysis of school-based universal interventions and have demonstrated that SEL interventions

significantly improved social and emotional skills, attitudes, and behaviors, well-being and academic performance, and reduced emotional and behavioral problems of participants from kindergarten through high school (Durlak et al., 2011; Taylor et al., 2017; Blewitt et al., 2018). Nowadays, SEL interventions are considered a public health approach to education, since they have the potential to improve the general population's health and well-being (Greenberg et al., 2017). According to CASEL (2020), the integration of SEL into the school's academic curriculum and the close collaboration with families and the community are beneficial to the effectiveness of SEL programs.

1.2.2. Health literacy and healthy lifestyles promotion

Health literacy is defined as one's "knowledge, motivation and competences to access, understand, appraise and apply health information in order to make judgements and take decisions in everyday life concerning health care, disease prevention and health promotion to maintain or improve quality of life during the life course" (World Health Organization, 2013, p. 4). It has been found to be associated with healthy behaviors and positive health outcomes in children, adolescents, and adults (e.g., Hsu et al., 2014; Fleary et al., 2018; Svendsen et al., 2020). Therefore, addressing health literacy from an early age is a promising investment in the health and well-being of individuals well into adulthood (Bröder and Carvalho, 2019), and it also has benefits for society, such as economic and social growth (World Health Organization, 2021). Despite its importance for public health, the majority of adolescents from European countries still only have a moderate level of health literacy (Paakkari et al., 2020). Approaches to improving health literacy education in schools are lacking worldwide (Pleasant et al., 2019; World Health Organization, 2021), including in Portugal.

Considering health literacy as a learning outcome in schools, Paakkari and Paakkari (2012) suggested a conceptual model of health literacy which includes two essential components—self-awareness and citizenship—besides the ones that constitute the commonly-accepted concept of health literacy (theoretical knowledge, practical knowledge, and critical thinking). The authors argue that children and adolescents need to understand themselves, others, and the world to make conscious and ethical decisions about health. For this reason, schools have an important role in promoting all these interrelated health literacy components that go beyond basic or functional health literacy (Paakkari and Paakkari, 2012).

In addition to delivering factual or practical information about health or healthy lifestyles, it is important to promote critical reflection and personal meaning-making processes among the students (Paakkari and Paakkari, 2012). For this reason, intervention strategies related to health literacy and healthy lifestyles should consider the adolescents' daily life, include hands-on and practical activities (Bröder and Carvalho, 2019), involve parents/caregivers (Pleasant et al., 2019), take a holistic approach, and target multiple behavioral changes simultaneously (Irvine et al., 2022). Considering the general trend of decreasing healthy lifestyles during adolescence, interventions must especially focus on improving physical activity and healthy eating, and on reducing screen time and substance use, which may also be beneficial for concurrent reductions in symptoms of depression and anxiety (e.g., Gunnell et al., 2016).

Given the recent increase in mental health problems among young people around the world, following the COVID-19 pandemic (Deng et al., 2023), special focus on mental health literacy has become increasingly necessary, since it is considered a prerequisite for early recognition, management, prevention, and intervention in mental disorders (Jorm, 2000), but also a necessary skill to maintain and obtain a good mental health (Kutcher et al., 2016). School-based interventions should promote positive mental health, but also help students "to differentiate normal mental distress from mental health problems/disorders, reduce stigma against mental illness, and promote help-seeking behaviors of students and mental health self-care if they need mental health care" (Kutcher et al., 2016, p. 568). Although the interventions specifically aimed at promoting mental health literacy in schools are few, there have been some positive results from short interventions that resulted in improvements in knowledge and use of self-help strategies and first-aid skills, as well as decreased stereotyping associated with increased knowledge about mental health problems (e.g., Skre et al., 2013; Campos et al., 2018). Additionally, "teen Mental Health First Aid" programs have also been found to be effective in improving mental health literacy, confidence in providing mental health first aid to peers, help-seeking intentions, and student's mental health, as well as in reducing stigmatizing attitudes (e.g., Hart et al., 2016).

1.2.3. Positive psychology interventions

Current perspectives in Positive Psychology consider a focus on positive life trajectories to be highly important for the promotion of strengths, well-being, and other positive outcomes, beyond the reduction of negative outcomes, in particular among children and adolescents (Norrish and Vella-Brodrick, 2009; Owens and Waters, 2020). Furthermore, this focus can contribute to positive human functioning and to individual, interpersonal, and societal flourishing (Seligman and Csikszentmihalyi, 2000). For this reason, Seligman et al. (2009) consider that positive education—i.e., "an adaptation of traditional forms of education focused on building academic competencies, blending the knowledge of well-being science with effective pedagogy to promote learning for traditional academic skills, optimal development, and wellbeing" (Oades et al., 2021, p. 293)—should be implemented in all schools. Well-being literacy (i.e., the capacity to understand and intentionally use well-being concepts or components to maintain or improve the well-being of oneself or others, taking into account the specific context) is, nowadays, considered a key competence underlying positive education pedagogy (Oades et al., 2021).

Character strengths interventions have proliferated since the publication of the empirically-driven classification of character strengths and virtues by Peterson and Seligman (2004), where these strengths are identified as relevant factors for promoting well-being and buffering against psychological disorders among youth. This system (Values-In-Action Strengths Classification) is composed of 24 ubiquitous character strengths (positive traits reflected in thoughts, feelings, and behaviors), organized into six broad virtues—courage, wisdom and knowledge, temperance, justice, humanity, and transcendence. Various character strengths-based interventions for adolescents, which focused on recognizing and exercising "signature strengths" in daily life, proved to have an impact on the life satisfaction, well-being, and flourishing of participants (e.g., "Strengths Gym," Proctor et al., 2011). Considering that a more frequent use of character strengths is associated with life purpose (Kashdan et al., 2022), these constructs should be jointly addressed with adolescents. Research has

also shown that interventions focused on life purpose or meaning are scarce (e.g., Burrow et al., 2022), but they seems to contribute to the improvement of adolescent well-being, resilience, and physical and mental health (Steger et al., 2021).

Other school-based positive psychology interventions with adolescents, focused on resilience, gratitude, kindness, or positive emotions, have led to improvements in well-being, pro-social behavior, and school performance, but also to a reduction in psychopathological symptoms (Norrish and Vella-Brodrick, 2009; Owens and Waters, 2020). For example, RESCUR, a universal curriculum that promotes resilience in children and adolescents from schools of six European countries, has shown very positive results in decreasing mental health difficulties and increasing both pro-social behaviors and well-being (e.g., Cefai et al., 2014; Simões et al., 2021). Gratitude building interventions developed with children and adolescents have also shown positive effects on psychological well-being, positive affect, positive feelings, life satisfaction, and gratitude (e.g., Froh et al., 2014; Khanna and Singh, 2016). Layous et al. (2012) developed a four-week intervention specifically to encourage preadolescents to perform acts of kindness and found improvements in the students' well-being and peer acceptance.

1.3. The present study protocol

The aim of the present study protocol is to describe the intervention and evaluation protocol of #EntreViagenseAprendizagens, a multi-component school-based intervention developed on the basis of the different approaches mentioned above (i.e., social and emotional learning, health literacy and healthy lifestyles promotion, and positive psychology), with a view to promoting well-being and healthy lifestyles among adolescents.

2. Methods and analysis

2.1. Selection of participants

Students in the 8th grade from three public schools of the Lisbon metropolitan area will be invited to participate in #EntreViagenseAprendizagens. The criteria for participation in the program include being enrolled in the 8th grade, agreeing to participate in the study (as part of the intervention or the control group), and having their parents or guardian's formal authorization to participate. All participants will read and sign an informed consent form, which states the objectives of the study and intervention and ensures the confidentiality of the data provided in the questionnaire responses (and of the content of the reflections shared in the sessions, in the case of intervention group participants).

2.2. Intervention

#EntreViagenseAprendizagens is a 20-week school-based intervention that uses the metaphor of a journey to a better world, for which students must prepare through learnings and skills they put in their "luggage." These learnings and skills are obtained by "making a stop" at different places in the city (e.g., "Market of Emotions," "Mind Gym"), which correspond to the various sessions. This metaphor aims to illustrate the preventive and holistic nature of the intervention.

As recommended for effective SEL programs, the design of the program was based on the SAFE (acronym for Sequenced, Active, Focused, and Explicit) approach (Durlak et al., 2011). Indeed, #EntreViagenseAprendizagens adopts a sequential training approach (e.g., activities on emotion recognition precede activities on emotion regulation strategies), uses active forms of learning, based on experiential and participatory activities (e.g., role-playing, debates), devotes sufficient time to skill development, and has explicit learning goals. The development of skills is facilitated by experiential and participatory learning during the sessions, but their application in other contexts is also promoted, notably through challenges proposed to be carried out during the week (e.g., activities to be developed by the students together with their families).

Five characters were created within the scope of the program and will be used to accompany the students throughout the intervention (Figure 1). The characters are teenagers with diverse characteristics (e.g., characters with different ethnicities and weights, a character with impaired mobility). The aim is to make it easier for all the students to identify with the themes of the program and to enhance their engagement with the intervention. The characters are featured in the four videos designed specifically for this program, which focus on themes covered in the sessions (#HealthLiteracy, #MentalHealthLiteracy, #CharacterStrengths, #Communication) and in the activity sheets used during the program. An Instagram® account for #EntreViagenseAprendizagens will be set up and used throughout the program to recall the "healthy tips" and run the "Well-being-Promoting Actions" photo contest (see below).

A pilot version of the program, including 10 sessions of 90 min each (Francisco et al., 2019b) and involving 54 students from 2 schools, was implemented and evaluated. The results of the pilot study revealed statistically significant improvements in some aspects of the participants' lifestyle (more hours of sleep on the weekend, increased soup consumption), in their emotional clarity and in two dimensions of their well-being (connectedness and optimism). Participants also reported a high level of satisfaction with the program. The qualitative data revealed that the main learnings and changes identified by the participants relate to improvements in self-awareness, emotion regulation skills, and healthy eating. The most valued aspects of the program regarding its procedures and activities were the debates and discussions, the active role-playing skills training, and the dynamic relationship created between all the participants, including the program facilitators. The participants suggested that a future version of the program should address mental health issues (Hormigo and Francisco, 2019). These findings led to some modifications, such as the inclusion of sessions specifically dedicated to mental health literacy, and a session with the participants' parents, considering the importance of family to the expected outcomes. Additionally, the duration of the sessions was reduced (and therefore the total number of sessions increased) to make it easier to integrate the program into the school curriculum (which in Portugal includes 50-min lessons).

2.2.1. Dimensions, themes, and skills covered by #EntreViagenseAprendizagens

Considering the five domains of social and emotional skills, proposed by CASEL (2020), some specific skills were selected from each domain, based on their relevance to the age of the target

FIGURE 1
Program characters.

population and their relationship with overall well-being, as shown in the literature and explained above. Thus, the program essentially focuses on the skills of emotion recognition, emotion regulation, self-control, self-esteem, empathy, communication, cooperation, and problem-solving, particularly in nine of its sessions. However, certain skills, especially those related to social awareness and relationships, are worked on transversally, since most of the proposed activities are developed in groups (e.g., debates, joint reflections). In turn, the video #Communication, used in the session especially dedicated to assertive communication, addresses a health-related theme—adolescent smoking—and its relationship with responsible decision-making and communication with parents, which illustrates the interrelation and integration of the different approaches, oriented towards the promotion of the overall well-being of the participants.

Six sessions were specifically created to promote health literacy and healthy lifestyles. Besides one session focused on general health literacy, which uses the video #HealthLiteracy to introduce the theme, three other sessions were designed to address different aspects of healthy lifestyles that are particularly critical for adolescents, such as eating habits and physical activity, but also screen use, sleep, and tobacco and alcohol consumption. In addition, the video #MentalHealthLiteracy introduces two specific sessions focused on the identification of different mental health problems (e.g., depression, anxiety, eating disorders), first-aid skills, and help-seeking strategies. Whitin the realm of prevention strategies and promotion of well-being and mental health, a session was specifically designed to focus on relaxation and mindfulness exercises, which are widely employed in positive psychology interventions.

Other themes related to positive psychology interventions are the subject of five sessions in particular. A special focus is placed on the theme of gratitude and empathy, highlighting the importance of positive interpersonal relationships and social connectedness for subjective well-being. The theme of subjective well-being is also present throughout the program, through the photo contest "Well-being-Promoting Actions," as will be explained below. Finally, the video #CharacterStrengths introduces the theme referred to in its title during a session designed to help students to find their character strengths (Peterson and Seligman, 2004). Their "signature strengths" are then used to work on themes such as purpose in life, commitment, adaptability, and resilience.

Table 1 presents the summary of the main skills to be developed throughout the 20 sessions (19 sessions for adolescents and one session for parents) and the main activities for each session.

2.2.2. Goals and hypotheses

The main goal of #EntreViagenseAprendizagens is to promote well-being and healthy lifestyles among adolescents. Specifically, the program aims to: (a) foster social and emotional skills (particularly self-regulation, communication, problem-solving, resilience, and adaptability); (b) identify and strengthen the students' virtues and character strengths, which contribute to the definition of their life purpose and to their ability to adapt; (c) increase general health literacy and mental health literacy; (d) improve knowledge and behaviors related to healthy lifestyles, especially physical activity and healthy eating; and (e) improve overall well-being. Indirectly, the program also serves the purpose of preventing the development of

TABLE 1 Summary of the content of the sessions.

Session	Main skills to be developed	Main activities
#01 "Zero Street"	Subjective well-being	-Icebreaking with students: name one thing you like and another you do not like -Presentation of the program -Debate about "a better world" and suggestions for improving today's world (e.g., What is the world like now? What would be the perfect world? What solutions exist? How can everyone contribute?) -Individual reflection on situations that contribute to well-being and for which each student is grateful
#02 "Health Roundabout"	Health literacy	-Debate about health (e.g., What does health mean to you? What makes you sick? What do you do to stay healthy?) and reliable information sources -Viewing of the video #HealthLiteracy -Discussion about the video: "What would you do in Maria's situation?" -Reflection on the concept of overall health
#03 "Market of Emotions"	Emotion recognition	-"EmoImage": identify the five basic emotions in images and classify them (sadness, anger, joy, fear, and disgust) -"Where do you feel emotions?": drawing a body and painting where emotions are felt -Reflection on students' perception of emotions and the differences and similarities between the paintings of the various groups
#04 "All Aboard Bus" [for parents]	Emotional literacy Communication Relational well-being	-"Verbal and Non-Verbal Communication Act": debate about communication styles -"Charades": discussion about effective communication with adolescents -"Emotional Awareness: Situations Sample": promotion of emotional awareness -"Action skills": sharing emotional regulation strategies -Reflection on how relationships promote well-being
#05 "Pharmacy of Feelings"	Emotion recognition Self-regulation	-"Thermometer of emotions": identify situations (related to school, family, friends, and individual) and paint the thermometer according to the intensity of the emotion -Reflection on emotional regulation strategies that could be implemented in the situations identified by the students (e.g., "how can I identify and reduce triggers?"; I should take a breath and slow down the moment between trigger and response; notice what I feel; name the emotion; accept it; engage in positive self-talk and/or make a choice about how to respond)
#06 "Solutions street"	Self-regulation Problem-solving	-Emotional Regulation Activity: discussion about how to adopt attitudes and behaviors adjusted to different emotionally intense situations typically experienced by adolescents -"Let us find out": debate on the set of solutions for the different situations presented
#07 "*EntreViagens* Restaurant"	Health literacy: Healthy eating	-Discussion about "What is a Healthy Diet?" -Video about the Food Wheel and educational presentation about the principles of the Mediterranean Diet -"Let us count sugar packets!": some foods are presented to the students (e.g., iced tea, chocolate milk, white milk, apple, cereal bar) and they have to find out how many packets of sugar are contained in each one -"Label Decoder": reading the labels of some food items
#08 "Mind Gym"	Health literacy: Physical activity	-"Who is who?": discussion about the differences between physical activity, exercise, sport and sedentary behavior -"Pyramid of time": presentation of the physical activity pyramid and discussion about the minimum time of daily physical activity, aerobic exercise, and strength and flexibility training -"Let us go practice": Four practical exercises (e.g., squats, jumping jacks)
#09 "Garden of Balance"	Health literacy: Healthy lifestyles	-"Quiz time": group quiz about healthy lifestyles (screen use, sleep, diet, physical activity, and alcohol, tobacco, and drug use) -Discussion about the key ideas
#10 "Mirror Shop"	Character strengths Adaptability	-Viewing and discussion of the video #CharacterStrengths -"Find out who you are": filling out the *VIA* Survey of Character Strengths -Debate about individual differences between participants and examples of how to use their "signature strengths"
#11 "Central square"	Mental health literacy Empathy	-"Let us talk about mental health problems": identification of symptoms and ways of helping someone who is experiencing a mental health problem (depression, anxiety or anorexia nervosa) -Viewing and discussion of the video #MentalHealthLiteracy
#12 "School of the mind"	Mental health literacy Self-regulation	-Identification of and group reflection on anxiety-producing situations in the school context -Discussion about different behaviors/strategies that can be used to prevent or deal with anxiety in those situations
#13 "Connection Club"	Self-regulation Subjective well-being	-"Time to relax…": guided practice of mindfulness and progressive muscle relaxation exercises -Reflection on and discussion about the impact of both exercises on the participants' body and mind

(Continued)

TABLE 1 (Continued)

Session	Main skills to be developed	Main activities
#14 "Parliament"	Communication	-Viewing and discussion of the video #Comunication -Reflection on the different styles of communication (aggressive, passive, and assertive) -"Let us communicate!": role-play of the different styles of communication
#15 "The Empathy Clinic"	Empathy Communication Subjective well-being	-Presentation of a video about empathy -Joint reflection on and discussion about the meaning of "empathy" and its impact on personal and social well-being -"Let us practice empathy!": role-play of different situations representing empathetic attitudes and behaviors
#16 "Garden of the future"	Ecological Literacy Communication Problem-solving	-Presentation of a video about climate change -Joint reflection on and discussion about the challenges facing the planet -"Let us find solutions for our planet!": debate about measures that contribute to environmental sustainability vs. difficulties in implementing these measures
#17 "Surprise!"	[Theme chosen by parents]	[To be defined according to the chosen theme]
#18 "Filter Factory"	Self-esteem Self-regulation	-Presentation of a video about self-esteem and social media filters -Joint reflection on and discussion about the impact of social media on adolescents' self-esteem -Debate about the pros and cons of the use of social media
#19 "Avenue of Well-Being"	Life Purpose Commitment Resilience	-Sharing and debate about the participants' Vision Board (images that represent what each participant wants to be, have, or achieve in the future) previously created at home -Reflection on how their "signature strengths" are a fundamental resource for achieving their goals for the future
#20 "Boarding gate"	End of program	-A tour of the program -Certificates of participation and photo contest awards

social and emotional adjustment problems (e.g., anxiety, depression, behavioral problems).

We hypothesize that the #EntreViagenseAprendizagens program will result in (1) a significant increase in social and emotional skills (self-control, cooperation, empathy, and stress resistance); (2) a significant decrease in emotion regulation difficulties (specifically, limited access to emotion regulation strategies and lack of emotional clarity); (3) a significant increase in general health literacy and mental health literacy (specifically, self-help strategies, first-aid skills and help-seeking, and knowledge about mental disorders); (4) a significant increase in knowledge about nutrition and physical activity; (5) a significant increase in health-related attitudes and behaviors (e.g., increase in physical activity and healthy eating, decrease in screen time); (6) a significant improvement in the perception of the quality of relationships with others (specifically, peer acceptance and relationships with mother and father); and (7) a significant increase in adolescent well-being (specifically, engagement, perseverance, optimism, connectedness, and happiness). We also hypothesize that the results will be maintained at the 9-month follow-up.

2.2.3. Structure of sessions with students

The sessions are implemented with groups of 12–15 students, with one facilitator per group. All sessions have clearly defined learning goals, and are dynamic and interactive, with a duration of 50 min (i.e., the same duration as regular curricular classes, in order to maximize the adolescents' attention and encourage adoption of the program by creating the possibility of integrating it into regular curricular units). Most sessions are structured as follows: a semi-structured individual (or group) activity, a semi-structured activity in small groups, and a final interactive debate on what was learned during the session.

Although there are always one or two key skills that are the focus of each session, in the same session several competencies can be worked on, given their association with different themes and the use of different types of activities. For example, in session #14, titled "Parliament," the main theme is communication (focusing on assertive communication as an important social and emotional skill); however, the themes covered in the scenarios presented to the students for the role-play concern different issues, such as (un)healthy behaviors, making it possible to work on health literacy at the same time.

At the end of each session, a "healthy tip" associated with the topic that was addressed during that session (e.g., #gratitude) is discussed and complemented with a "challenge of the week." This challenge is an intersession activity to be developed during the week (e.g., "gratitude agenda") and related to the content of the session. This activity can be shared and discussed at the next session if the participants so wish.

In the first session, each student will receive a folder in which to place all the activity sheets completed during the program. This folder will then serve as a portfolio and a record of the student's evolution and involvement.

2.2.4. Involvement of students' parents

Before the program begins, all parents/guardians of students in the intervention group will be invited to attend an online session, where the objectives of the program will be presented and doubts will be clarified. This session aims to promote family involvement from the beginning of the program and to motivate families to participate in some of the challenges of the week. As defined by the American Psychological Association (2023), school-based interventions should

include special homework assignments to be completed with parents. Therefore, alerting parents to its relevance is essential from the start.

The fourth session of the program is aimed at the parents/guardians, focusing on their role in promoting the well-being of the students. In this session, the parents will also be asked to vote on a topic they consider relevant to be subsequently included in the "surprise" session of the program (session 17). Examples of such topics are bullying and peer pressure.

2.2.5. Photo contest "well-being-promoting actions"

The program includes a photography competition, titled "Well-being-Promoting Actions," associated with the photovoice methodology (Wang and Burris, 1997) and run on the program's Instagram® account. The contest aims to promote the involvement of the students, their families, the school community, and the community in general as well as amplify the effect of the intervention. The use of photovoice will allow students to engage their creativity and become more interested in reflecting and writing about their well-being, increasing their well-being literacy (Oades et al., 2021). It will also contribute to improving their self-esteem and self-determination, as the students feel respected and considered (Golden, 2020).

Students will take a photo of something they do that they think contributes to their well-being and write a five-line paragraph explaining why they chose it and what the photo says about their perception of health and well-being. The photos will be posted on the Instagram® page of #EntreViagenseAprendizagens, where the voting will take place. In each school, the three best photographs (with the most "likes") will be elected, and their authors will receive a prize (e.g., book/music shop vouchers). The competition may result in a photo exhibition at the schools, at the end of the school year. The aim of the exhibition is to integrate the learnings acquired during the program and showcase them to the rest of the school, thus promoting a sense of belonging and normalization of the themes addressed. This exhibition may also help the whole school community to reflect on these themes.

2.2.6. Context of implementation and facilitators

The program can be implemented in two different formats: (a) integrated into an 8th or 9th grade subject at the choice of each school (e.g., Citizenship and Development), running for two periods of the school year; (b) as an extracurricular activity of the schools. The first option allows for a greater number of participants and a broader scope of the program. In the evaluation study of #EntreViagenseAprendizagens, only students from the 8th grade attending the regular curriculum (subject of Citizenship and Development) will be included.

The program will be facilitated by psychologists with a master's degree in Psychology, preferably with experience in therapeutic intervention with adolescents. The facilitators will receive training from the first author (project coordinator) regarding the #EntreViagenseAprendizagens program, which will cover, among other aspects, the objectives and contents of each session. Biweekly follow-up meetings with the project coordinator will be held to deal with any unforeseen circumstances that may arise, highlight important aspects of each session, deliver materials, monitor the adequacy and fidelity of the implementation, and brainstorm about aspects that might be improved.

2.3. Intervention impact evaluation

2.3.1. Design and procedure

A cluster randomized controlled trial design will be used for impact evaluation, with 8th grade classes (units of randomization) from three public schools being assigned to either the intervention or the control condition. Data collection will be based on structured questionnaires applied to all students, both in the control group and the intervention group. Baseline measures (T0) will be collected with all potential participants prior to intervention implementation. In each school, three classes will then be randomly selected to be part of the intervention group in Year 1, while the remaining classes will be the control group. Students who integrate the control group in Year 1 will be part of the Intervention Group in Year 2. The post-test (T1) will take place approximately 1 week after the end of the program and the follow-up (T2) will take place 9 months later.

2.3.2. Instruments

2.3.2.1. Social and emotional skills

Social and emotional skills will be assessed using two instruments.

Four subscales (with eight items each) of the Organization for Economic Co-operation and Development (OECD) Study on Social and Emotional Skills (SSES; Organisation for Economic Co-operation and Development, 2021) will be used to evaluate self-control (e.g., "I stop to think before acting"), cooperation (e.g., "I am always willing to help classmates"), empathy (e.g., "I understand what others want"), and stress resistance (e.g., "I am relaxed and handle stress well"). The items are answered on a 5-point Likert-type scale from 1 (completely disagree) to 5 (completely agree). The Portuguese version that will be used presents satisfactory levels of internal consistency (ranging from $\alpha = 0.67$ to $\alpha = 0.74$ for the subscales that will be used; Organisation for Economic Co-operation and Development, 2021).

Two subscales of Difficulties in Emotion Regulation Scale (DERS; Gratz and Roemer, 2004) will be used to assess two components of emotion regulation, specifically "limited access to emotion regulation strategies" (eight items; e.g., "When I'm upset, it takes me a long time to feel better") and "lack of emotional clarity" (five items; e.g., "I am confused about how I feel"). These items are answered on a 5-point Likert-type scale from 1 ("almost never applies to me") to 5 ("almost always applies to me"). The higher the score on each of the subscales, the greater the participants' emotion regulation difficulties. The Portuguese version that will be used presents good internal consistency ($\alpha = 0.88$ and $\alpha = 0.75$, respectively) for these two subscales (Coutinho et al., 2010).

2.3.2.2. Well-being

The EPOCH Measure of Adolescent Well-Being (Kern et al., 2016) will be applied to evaluate five positive psychological characteristics considered to contribute to well-being, physical health, and other positive outcomes: engagement (e.g., "I get completely absorbed in what I am doing"), perseverance (e.g., "I finish whatever I begin"), optimism (e.g., "I am optimistic about my future"), connectedness (e.g., "When I have a problem, I have someone who will be there for me") and happiness (e.g., "I feel happy"). Each subscale is composed of four items, answered on a 5-point Likert-type scale from 1 (almost never/not at all like me) to 5 (almost always/very much like me). Both the original and the

Portuguese version that will be used (Francisco et al., 2019a) present good internal consistency (from $\alpha = 0.74$ to $\alpha = 0.86$, and from $\alpha = 0.82$ to $\alpha = 0.93$, respectively).

2.3.2.3. Health literacy

The Health Literacy for School-Aged Children (HLSAC; Paakkari et al., 2016) will be used to assess students' subjective health literacy. It is composed of 10 items, two items from each of five predetermined theoretical components: theoretical knowledge (e.g., "I have good information about health"), practical knowledge (e.g., "When necessary, I find health-related information that is easy for me to understand"), critical thinking (e.g., "I can usually figure out if some health-related information is right or wrong"), self-awareness (e.g., "I can give reasons for choices I make regarding my health"), and citizenship (e.g., "I can judge how my own actions affect the surrounding natural environment"). The items have a 4-point Likert-type response scale from 1 (not at all true) to 4 (absolutely true). The sum of the answers allows the identification of the participants' levels of health literacy: "low" (score 10–25), "moderate" (score 26–35), and "high" (score 36–40; Paakkari et al., 2018). Both the original (Paakkari et al., 2016) and the Portuguese version (Francisco, 2020) that will be used present good internal consistency for total score ($\alpha = 0.93$ and $\alpha = 0.87$, respectively).

Twelve items from the young people version of the Mental Health Literacy Questionnaire (MHLq; Campos et al., 2016), directly related to the contents on mental health literacy covered by #EntreViagenseAprendizagens, were selected to serve as indicators of self-help strategies (four items; e.g., "Physical exercise helps to improve mental health"), first aid skills and help-seeking (four items; e.g., "If a friend of mine developed a mental disorder, I would encourage her/him to get medical support"), and knowledge/stereotypes (four items; e.g., "Mental disorders affect people's thoughts") about mental health. The items have a 5-point Likert-type response scale from 1 (strongly disagree) to 5 (strongly agree). The original version of this questionnaire, with 34 items, presents good internal consistency (from $\alpha = 0.72$ to $\alpha = 0.79$ for each factor, and $\alpha = 0.84$ total score).

2.3.2.4. Health-related knowledge, attitudes, and behaviors

To evaluate knowledge, attitudes, and behaviors associated with health, 14 items answered on a Likert-type scale from HBSC studies (Inchley et al., 2018) will be used. They relate to physical activity (e.g., "In the last 7 days, in how many days did you accumulate at least 60 min of physical activity (e.g., gymnastics, sports, playing football, walking to school, etc.)?"), alcohol and tobacco consumption (e.g., "How often do you smoke tobacco?"), screen time ("In your free time, during the week, how much time per day do you use screens such as iPads, television, cell phones, or computers?"), eating habits (e.g., "During the week how often do you eat soup?"), and sleep habits (e.g., "How many hours, on average, do you sleep at night on weekdays?").

Five multiple-choice questions, adapted from the Questionnaire of Nutrition (NUT-Q; Raich et al., 2008), will be also used to measure knowledge of nutrition and particular types of food. For example: "Which of the following nutrients constitute the body's main energy reserve?" (possible answers: proteins; vitamins and minerals; fats; carbohydrates; I do not know). The sum of the correct answers corresponds to the total value for this dimension (ranging from 0 to 5).

Four items, taken from the Portuguese barometer for physical activity (Silva et al., 2018), will be used to assess students' knowledge about physical activity. Participants indicate on a 5-point Likert-type scale their level of agreement with the sentences presented (e.g., "Climbing stairs or walking is not physical activity," "Only high-intensity physical activity has beneficial effects").

2.3.2.5. Relationships with others

Specific items from HBSC studies (Inchley et al., 2018) will be used to evaluate students' peer acceptance (e.g., "My classmates accept me for who I am") with a Likert-type scale from 1 ("False most of the times") to 3 ("True most of the times"), as well as their participation in situations of conflict or violence (e.g., "How many times have you taken part in provocations to another student(s), in the last 2 months?"), with a five Likert-type scale from 1 ("I did not take part in provocations") to 5 ("Several times a week").

Two items to assess the students' relationship with both parents will be also presented (e.g., "How do you evaluate your relationship with your mother?"), answered on a 5-point Likert-type scale from 1 ("Very bad") to 5 ("Very good").

2.3.2.6. Sociodemographic data

Information about the sociodemographic characteristics of students and their parents will be collected for the present study, including sex, age, special educational needs, household, and parents' marital status and level of education, among others.

2.3.3 Data analysis

Descriptive statistics will be used to describe intervention and control group participants, replying to the pre-test, post-test, and follow-up questionnaires. To assess intervention effectiveness, statistically significant differences (and effect sizes) between the intervention and control groups will be examined by repeated measures ANOVA, contrasting results from the intervention and control groups (between-subjects factor) on the different outcome measures (e.g., social and emotional skills, health literacy, well-being) at pre-test, post-test, and follow-up (within-subjects factor).

2.4. Intervention process evaluation

2.4.1. Design and procedure

Process evaluation will rely on a mixed-methods approach, combining quantitative (i.e., questionnaires) and qualitative methods (e.g., focus groups). Students in the intervention group will participate in an initial qualitative assessment of their expectations and a final global assessment, in terms of their satisfaction with the intervention and intervention quality, using a questionnaire, with both closed questions (Likert-type scales) and open-ended questions. The program facilitators will also complete a session evaluation sheet at the end of each session, in order to check intervention fidelity. Additionally, sessions and program evaluation sheets will be applied immediately after each session to participants of the intervention group. At the end of the program, focus groups will be held with: (1) students from the three schools where the program will be implemented (one per intervention group); (2) three focus groups with parents (one per school); and (3) one focus group with teachers

from the subject into which the program will be integrated and/or the class director (i.e., the teacher who is responsible for a particular class in school).

2.4.2. Instruments

2.4.2.1. Session evaluation sheets

Session evaluation sheets will be filled in after each session, both by intervention participants and facilitators. The students' post-session evaluation questionnaires will include: (1) one item evaluating overall satisfaction with the session (i.e., "In general, did you like today's session?"), answered on a Likert-type scale, ranging from 1 ("Did not like it") to 4 ("Liked it very much"); (2) five items assessing the session's perceived relevance ("Was the session important?"), interest ("Was the session interesting?"), and challenge ("Was the session challenging?"), as well as the degree to which the students feel they have developed their competences ("Do you feel that you have developed your skills?") and whether they had difficulty in concentrating ("Did you feel difficulty in concentrating?"), all answered on a Likert-type scale ranging from 1 ("Not at all") to 4 ("Very much"); and (3) two open-ended questions, where participants can mention the most and least appreciated aspects of the session (e.g., "What did you like the most in today's session?").

The sessions' evaluation sheets completed by the facilitators to register relevant data at the end of each session (e.g., participants' attendance, themes/contents covered, any deviations from the plan for each session) will be used to check intervention fidelity (i.e., whether the program is being implemented as planned). Their content will be discussed during the biweekly follow-up meetings with the project coordinator.

2.4.2.2. Overall program evaluation questionnaire

At the end of the intervention, an overall intervention evaluation questionnaire will be applied to participants, including: (1) one item to collect a global assessment of the intervention, answered on a Likert-type scale ranging from 1 ("Did not like it") to 4 ("Liked it very much"); (2) seven open-ended questions, with the purpose of identifying the program features and components that pleased the intervention participants the most and the least, what they consider to have learned, and their suggestions regarding changes that could be applied in future program implementations.

2.4.2.3. Focus group interview guides

Semi-structured interview guides for the focus groups with participants, parents, and teachers will be structured around four main topics: (1) whether they consider the program to be beneficial; (2) what sessions, themes, activities, and components they (or their children/students) liked the most and the least, and why; (3) what they (or their children/ students) consider to have learned, and whether they perceived any changes in relation to the social and emotional skills targeted by the program (e.g., emotion regulation, communication), well-being, relationships with others, health literacy, and/or lifestyles; (4) suggestions regarding changes for future versions of the program (e.g., new contents and implementation logistics, such as scheduling, sessions duration and dynamics, etc.).

The interview guide for parents will also include questions regarding the usefulness of the program session dedicated to parents and their experiences with the activities that required the parents' involvement (e.g., "challenges of the week" activities). The interview guide for teachers will also include questions regarding the adequacy of the integration of the program into a regular curricular subject (e.g., Citizenship and Development) and alternative forms of program implementation (e.g., as extracurricular activity).

2.4.3. Data analysis

Descriptive statistics will be used to describe the evaluation of each session and of the overall program made by the participants. To determine whether specific sessions are perceived as being significantly more/less interesting, challenging, and relevant, whether participants perceived the session as contributing more/less to the development of new competencies, and whether they felt more/less difficulty in concentrating, analyses of variance (ANOVAs) will be conducted. Thematic analysis (Braun and Clarke, 2006) will be performed on all qualitative data gathered from the session evaluation sheets, overall program evaluation questionnaire, and focus groups transcriptions.

3. Dissemination

The plan for disseminating the #EntreViagenseAprendizagens program includes the following measures: (a) publish the results on the effectiveness of the intervention program in peer-reviewed journals; (b) write a technical manual (including all videos and activity sheets to be used) to ensure that the program is implemented in the same way by different facilitators and with different groups; and (c) train program facilitators, through workshops on the theoretical rationale and methods for the implementation of #EntreViagenseAprendizagens in schools, targeting teachers, psychologists and other school and mental health professionals who want to implement this program with adolescents.

4. Discussion

The aim of the present paper is two-fold: to describe the content of a school-based intervention designed to promote adolescent well-being through the development of social and emotional skills, health literacy, and healthy lifestyles in 8th and 9th grade students; and to present its evaluation protocol. Despite the numerous school-based interventions focused on social and emotional skills, mental health, and healthy lifestyles, or even specific school-based positive psychology interventions, there have been few interventions aimed at promoting the well-being of adolescents in such a comprehensive way, considering all its dimensions. #EntreViagenseAprendizagens is innovative, since it is a multi-component school-based intervention that takes into account the adolescents' overall well-being, including their mental and physical health and well-being, alongside character strengths and social and emotional skills, all of which are essential to their future adaptation in a continuously changing world. This is a relevant fact, considering that multi-component interventions are in line with the most recent conceptualizations of adolescent well-being (Ross et al., 2020) and of health-promoting schools (World Health Organization and United Nations Educational, Scientific and Cultural Organization, 2021).

The development of the program is based on solid intervention approaches that have shown promising results, such as social and emotional learning (CASEL, 2020), health literacy promotion (Bröder and Carvalho, 2019), and positive psychology interventions (Seligman

et al., 2009). Moreover, the use of an experimental design with pre- and post-intervention measurements for impact evaluation will make it possible to provide solid evidence on the effectiveness of the intervention. If the expected results are achieved, future research should continue to investigate this intervention and its mechanisms for action by standardizing its design. Furthermore, process evaluation based on the use of mixed methods will provide insights into contextual factors and mechanisms that may impact the overall intervention effects, informing future program adaptations, if needed.

It is urgent to invest in a whole-school approach, with the integration of #EntreViagenseAprendizagens and other similar programs into the compulsory school curriculum, which can be adapted to the specific needs of each group of students and allow for the development of real health-promoting schools (World Health Organization and United Nations Educational, Scientific and Cultural Organization, 2021).

Data availability statement

The original contributions presented in the study are included in the article, and further inquiries can be directed to the corresponding author.

Author contributions

RF and CG designed the study protocol. RF conceptualized the school-based intervention #EntreViagenseAprendizagens, coordinated the study, and was responsible for funding acquisition. RF, BR, MS, and MH developed the pilot version of #EntreViagenseAprendizagens. AC and AJ contributed to the optimization of the present version of #EntreViagenseAprendizagens. All authors contributed to the article and approved the submitted version.

Funding

This research is funded by Gulbenkian Academies for Knowledge (Ref. 240626), Calouste Gulbenkian Foundation.

Acknowledgments

We would like to thank the Directorate-General of Health (Portugal), especially our colleagues from the National Program for the Promotion of Healthy Eating and the National Program for the Promotion of Physical Activity, for their collaboration in the design of sessions 7 and 8 of our program, on healthy eating and physical activity, respectively. We also want to thank the Calouste Gulbenkian Foundation and the Gulbenkian Academies for Knowledge monitoring and evaluation team for their support. Finally, we want to thank Liliana Marisco for the design of the program's characters and videos and Adriana Barreiros for the English revision of the manuscript.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Publisher's note

All claims expressed in this article are solely those of the authors and do not necessarily represent those of their affiliated organizations, or those of the publisher, the editors and the reviewers. Any product that may be evaluated in this article, or claim that may be made by its manufacturer, is not guaranteed or endorsed by the publisher.

References

American Psychological Association. (2023). School-based intervention. APA Dictionary of Psychology. Available at: https://dictionary.apa.org/school-based-intervention

Ames, M. E., and Leadbeater, B. J. (2018). Depressive symptom trajectories and physical health: persistence of problems from adolescence to young adulthood. *J. Affect. Disord.* 240, 121–129. doi: 10.1016/j.jad.2018.07.001

Blewitt, C., Fuller-Tyszkiewicz, M., Nolan, A., Bergmeier, H., Vicary, D., Huang, T., et al. (2018). Social and emotional learning associated with universal curriculum-based interventions in early childhood education and care centers: a systematic review and meta-analysis. *JAMA Netw. Open* 1:e185727. doi: 10.1001/jamanetworkopen.2018.5727

Braun, V., and Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Res. Psychol.* 3, 77–101. doi: 10.1191/1478088706qp063oa

Bröder, J., and Carvalho, G. S. (2019). "Health literacy of children and adolescents: conceptual approaches and developmental considerations" in *International Handbook of Health Literacy: Research, Practice and Policy Across the Lifespan*. eds. O. Okan, U. Bauer, D. Levin-Zamir, P. Pinheiro and K. Sorensen (Bristol: Policy Press), 39–52.

Burrow, A. L., Ratner, K., Porcelli, S., and Sumner, R. (2022). Does purpose grow here? Exploring 4-H as a context for cultivating youth purpose. *J. Adolesc. Res.* 37, 471–500. doi: 10.1177/0743558420942477

Campos, L., Dias, P., Duarte, A., Veiga, E., Dias, C. C., and Palha, F. (2018). Is it possible to "find space for mental health" in young people? Effectiveness of a school-based mental health literacy promotion program. *Int. J. Environ. Res. Public Health* 15:1426. doi: 10.3390/ijerph15071426

Campos, L., Dias, P., Palha, F., Duarte, A., and Veiga, E. (2016). Development and psychometric properties of a new questionnaire for assessing mental health literacy in young people. *Univ. Psychol.* 15, 61–72. doi: 10.11144/Javeriana.upsy15-2.dppq

CASEL. (2020). CASEL's SEL framework: what are the core competence areas and where are they promoted? Available at:https://casel.org/casel-sel-framework-11-2020/

CASEL. (2023). About CASEL. Available at: https://casel.org/about-us/

Cefai, C., Matsopoulos, A., Bartolo, P., Galea, K., Gavogiannaki, M., Zanetti, M. A., et al. (2014). A resilience curriculum for early years and primary schools in Europe: enhancing quality education. *Croat. J. Educ.* 16, 11–32.

Coutinho, J., Ribeiro, E., Ferreirinha, R., and Dias, P. (2010). Versão portuguesa da escala de dificuldades de regulação emocional e sua relação com sintomas psicopatológicos [The Portuguese version of the difficulties in emotion regulation scale and its relationship with psychopathological symptoms]. *Revista de Psiquiatria Clínica* 37, 145–151. doi: 10.1590/S0101-60832010000400001

Deng, J., Zhou, F., Hou, W., Heybati, K., Lohit, S., Abbas, U., et al. (2023). Prevalence of mental health symptoms in children and adolescents during the COVID-19 pandemic: a meta-analysis. *Ann. N. Y. Acad. Sci.* 1520, 53–73. doi: 10.1111/nyas.14947

Durlak, J. A., Weissberg, R. P., Dymnicki, A. B., Taylor, R. D., and Schellinger, K. B. (2011). The impact of enhancing students' social and emotional learning: a meta-analysis of school-based universal interventions. *Child Dev.* 82, 405–432. doi: 10.1111/j.1467-8624.2010.01564.x

Fleary, S. A., Joseph, P., and Pappagianopoulos, J. E. (2018). Adolescent health literacy and health behaviors: a systematic review. *J. Adolesc.* 62, 116–127. doi: 10.1016/j.adolescence.2017.11.010

Francisco, R. (2020). *Versão Portuguesa do health literacy for school-aged children [Portuguese version of the health literacy for school-aged children—research version]*. Lisboa: Universidade Católica Portuguesa.

Francisco, R., Hormigo, M., Sesifredo, M., and Raposo, B. (2019a). *Versão Portuguesa do EPOCH—Medida de bem-estar do adolescente [Portuguese version of the EPOCH measure of adolescent well-being—research version]*. Lisboa: Universidade Católica Portuguesa.

Francisco, R., Raposo, B., Hormigo, M., and Sesifredo, M. (2019b). "#EntreViagenseAprendizagens: development of a program for the promotion of wellbeing and healthy lifestyles" in *Book of abstracts of the 5th international congress of clinical and Health Psychology with children and adolescents, Oviedo, 14–16 november 2019*. eds. M. Orgilés and I. Fernández-Martínez (Madrid: Ediciones Pirámide), 91–92.

Frech, A. (2012). Healthy behavior trajectories between adolescence and young adulthood. *Adv. Life Course Res.* 17, 59–68. doi: 10.1016/j.alcr.2012.01.003

Frey, M., Obermeier, V., von Kries, R., and Schulte-Körne, G. (2020). Age and sex specific incidence for depression from early childhood to adolescence: a 13-year longitudinal analysis of German health insurance data. *J. Psychiatr. Res.* 129, 17–23. doi: 10.1016/j.jpsychires.2020.06.001

Froh, J. J., Bono, G., Fan, J., Emmons, R. A., Henderson, K., Harris, C., et al. (2014). Nice thinking! An educational intervention that teaches children to think gratefully. *Sch. Psychol. Rev.* 43, 132–152. doi: 10.1080/02796015.2014.12087440

Golden, T. (2020). Reframing Photovoice: building on the method to develop more equitable and responsive research practices. *Qual. Health Res.* 30, 960–972. doi: 10.1177/1049732320905564

Gratz, K. L., and Roemer, L. (2004). Multidimensional assessment of emotion regulation and dysregulation: development, factor structure, and initial validation of the difficulties in emotion regulation scale. *J. Psychopathol. Behav. Assess.* 26, 41–54. doi: 10.1023/B:JOBA.0000007455.08539.94

Greenberg, M. T., Domitrovich, C. E., Weissberg, R. P., and Durlak, J. A. (2017). Social and emotional learning as a public health approach to education. *Future Child.* 27, 13–32. doi: 10.1353/foc.2017.0001

Gunnell, K. E., Flament, M. F., Buchholz, A., Henderson, K. A., Obeid, N., Schubert, N., et al. (2016). Examining the bidirectional relationship between physical activity, screen time, and symptoms of anxiety and depression over time during adolescence. *Prev. Med.* 88, 147–152. doi: 10.1016/j.ypmed.2016.04.002

Hart, L. M., Mason, R. J., Kelly, C. M., Cvetkovski, S., and Jorm, A. F. (2016). "Teen mental health first aid": a description of the program and an initial evaluation. *Int. J. Ment. Heal. Syst.* 10, 3–18. doi: 10.1186/s13033-016-0034-1

Hendriks, A. M., Bartels, M., Stevens, G. W. J. M., Walsh, S. D., Torsheim, T., Elgar, F. J., et al. (2020). National child and adolescent health policies as indicators of adolescent mental health: a multilevel analysis of 30 European countries. *J. Early Adolesc.* 40, 537–565. doi: 10.1177/0272431619858413

Hormigo, M., and Francisco, R. (2019). "Evaluation of #EntreViagenseAprendizagens implemented in two schools: qualitative and quantitative results," in *Book of Abstracts of the 5th International Congress of Clinical and Health Psychology With Children and Adolescents, Oviedo, 14 -16 November 2019*. eds. M. Orgilés and I. Fernández-Martínez (Madrid: Ediciones Pirámide), 92.

Hsu, W., Chiang, C., and Yang, S. (2014). The effect of individual factors on health behaviors among college students: the mediating effects of eHealth literacy. *J. Med. Internet Res.* 16:e287. doi: 10.2196/jmir.3542

Inchley, J., Currie, D., Cosma, A., and Samdal, O. (2018). Health behaviour in school-aged children (HBSC) study protocol: Background, methodology and mandatory items for the 2017/18 survey. CAHRU.

Irvine, D. S., McGarity-Shipley, E., Lee, E.-Y., Janssen, I., and Leatherdale, S. T. (2022). Longitudinal associations between e-cigarette use, cigarette smoking, physical activity, and recreational screen time in Canadian adolescents. *Nicotine Tob. Res.* 24, 978–985. doi: 10.1093/ntr/ntab248

Jarden, A., Jarden, R., Chin, T., and Kern, M. L. (2021). "Assessing wellbeing in school communities" in *The Palgrave Handbook of Positive Education*. eds. M. L. Kern and M. L. Wehmeyer (London: Palgrave Macmillan), 297–324.

Jorm, A. F. (2000). Mental health literacy: public knowledge and beliefs about mental disorders. *Br. J. Psychiatry* 177, 396–401. doi: 10.1192/bjp.177.5.396

Kashdan, T. B., McKnight, P. E., and Goodman, F. R. (2022). Evolving positive psychology: a blueprint for advancing the study of purpose in life, psychological strengths, and resilience. *J. Posit. Psychol.* 17, 210–218. doi: 10.1080/17439760.2021.2016906

Kern, M. L., Benson, L., Steinberg, E. A., and Steinberg, L. D. (2016). The EPOCH measure of adolescent well-being. *Psychol. Assess.* 28, 586–597. doi: 10.1037/pas0000201

Kern, M. L., Waters, L. E., Adler, A., and White, M. A. (2015). A multidimensional approach to measuring well-being in students: application of the PERMA framework. *J. Posit. Psychol.* 10, 262–271. doi: 10.1080/17439760.2014.936962

Khanna, P., and Singh, K. (2016). Effect of gratitude educational intervention on well-being indicators among north Indian adolescents. *Contemp. Sch. Psychol.* 20, 305–314. doi: 10.1007/s40688-016-0087-9

Kutcher, S., Wei, Y., Costa, S., Gusmão, R., Skokauskas, N., and Sourander, A. (2016). Enhancing mental health literacy in young people. *Eur. Child Adolesc. Psychiatry* 25, 567–569. doi: 10.1007/s00787-016-0867-9

Layous, K., Nelson, S. K., Oberle, E., Schonert-Reichl, K. A., and Lyubomirsky, S. (2012). Kindness counts: prompting prosocial behavior in preadolescents boosts peer acceptance and well-being. *PLoS One* 7, 7–9. doi: 10.1371/journal.pone.0051380

Leadbeater, B., Thompson, K., and Gruppuso, V. (2012). Co-occurring trajectories of symptoms of anxiety, depression, and oppositional defiance from adolescence to young adulthood. *J. Clin. Child Adolesc. Psychol.* 41, 719–730. doi: 10.1080/15374416.2012.694608

Marques, A., Demetriou, Y., Tesler, R., Gouveia, É. R., Peralta, M., and Matos, M. G. (2019). Healthy lifestyle in children and adolescents and its association with subjective health complaints: findings from 37 countries and regions from the HBSC study. *Int. J. Environ. Res. Public Health* 16:3292. doi: 10.3390/ijerph16183292

Norrish, J. M., and Vella-Brodrick, D. A. (2009). Positive psychology and adolescents: where are we now? Where to from here? *Aust. Psychol.* 44, 270–278. doi: 10.1080/00050060902914103

Oades, L. G., Baker, L. M., Francis, J. J., and Taylor, J. A. (2021). "Wellbeing literacy and positive education" in *The Palgrave Handbook of Positive Education*. eds. M. L. Kern and M. L. Wehmeyer (London: Palgrave Macmillan), 325–343.

Orben, A., Lucas, R. E., Fuhrmann, D., and Kievit, R. A. (2022). Trajectories of adolescent life satisfaction. *R. Soc. Open Sci.* 9:211808. doi: 10.1098/rsos.211808

Organisation for Economic Co-operation and Development. (2021). OECD survey on social and emotional skills: technical report. Available at: https://www.oecd.org/education/ceri/social-emotional-skills-study/sses-technical-report.pdf

Owens, R. L., and Waters, L. (2020). What does positive psychology tell us about early intervention and prevention with children and adolescents? A review of positive psychological interventions with young people. *J. Posit. Psychol.* 15, 588–597. doi: 10.1080/17439760.2020.1789706

Paakkari, L., and Paakkari, O. (2012). Health literacy as a learning outcome in schools. *Health Educ.* 112, 133–152. doi: 10.1108/09654281211203411

Paakkari, O., Torppa, M., Kannas, L., and Paakkari, L. (2016). Subjective health literacy: development of a brief instrument for school-aged children. *Scand. J. Public Health* 44, 751–757. doi: 10.1177/1403494816669639

Paakkari, L., Torppa, M., Mazur, J., Boberova, Z., Sudeck, G., Kalman, M., et al. (2020). A comparative study on adolescents' health literacy in Europe: findings from the HBSC study. *Int. J. Environ. Res. Public Health* 17:3543. doi: 10.3390/ijerph17103543

Paakkari, O., Torppa, M., Villberg, J., Kannas, L., and Paakkari, L. (2018). Subjective health literacy among school-aged children. *Health Educ.* 118, 182–195. doi: 10.1108/HE-02-2017-0014

Peterson, C., and Seligman, M. (2004). *Character Strengths and Virtues: A Handbook and Classification*. Washington, DC; Oxford: APA Press and Oxford University Press.

Pleasant, A., Griffin, K. H., Maish, C., O'Leary, C., and Carmona, R. (2019). "Health literacy interventions for children or adolescents: an overview and insights into practical applications" in *International Handbook of Health Literacy*. eds. O. Okan, U. Bauer, D. Levin-Zamir, P. Pinheiro and K. Sørensen (Bristol: Policy Press), 307–322.

Proctor, C., Tsukayama, E., Wood, A. M., Maltby, J., Eades, J. F., and Linley, P. A. (2011). Strengths gym: the impact of a character strengths-based intervention on the life satisfaction and well-being of adolescents. *J. Posit. Psychol.* 6, 377–388. doi: 10.1080/17439760.2011.594079

Raich, R. M., Sánchez-Carracedo, D., López-Guimerà, G., Portell, M., Moncada, A., and Fauquet, J. (2008). A controlled assessment of school-based preventive programs for reducing eating disorder risk factors in adolescent Spanish girls. *Eat. Disord.* 16, 255–272. doi: 10.1080/10640260802016852

Ross, D. A., Hinton, R., Melles-Brewer, M., Engel, D., Zeck, W., Fagan, L., et al. (2020). Adolescent well-being: a definition and conceptual framework. *J. Adolesc. Health* 67, 472–476. doi: 10.1016/j.jadohealth.2020.06.042

Seligman, M., and Csikszentmihalyi, M. (2000). Positive psychology: an introduction. *Am. Psychol.* 55, 5–14. doi: 10.1037/0003-066X.55.1.5

Seligman, M., Ernst, R. M., Gillham, J., Reivich, K., and Linkins, M. (2009). Positive education: positive psychology and classroom interventions. *Oxf. Rev. Educ.* 35, 293–311. doi: 10.1080/03054980902934563

Silva, C. S., Marques, A., Mendes, R., Silva, M. N., Tomás, R., and Teixeira, P. J. (2018). The Portuguese physical activity barometer: perceptions, attitudes, motivation and knowledge. *J. Phys. Act. Health* 15:S142.

Simões, C., Santos, A. C., Lebre, P., Daniel, J. R., Branquinho, C., Gaspar, T., et al. (2021). Assessing the impact of the European resilience curriculum in preschool, early and late primary school children. *Sch. Psychol. Int.* 42, 539–566. doi: 10.1177/01430343211025075

Skre, I., Friborg, O., Breivik, C., Johnsen, L. I., Arnesen, Y., and Wang, C. E. A. (2013). A school intervention for mental health literacy in adolescents: effects of a non-randomized cluster controlled trial. *BMC Public Health* 13:873. doi: 10.1186/1471-2458-13-873

Steger, M. F., O'Donnell, M. B., and Morse, J. L. (2021). "Helping students find their way to meaning: meaning and purpose in education" in *The Palgrave Handbook of*

Positive Education. eds. M. L. Kern and M. L. Wehmeyer (London: Palgrave Macmillan), 551–578.

Svendsen, M. T., Bak, C. K., Sørensen, K., Pelikan, J., Riddersholm, S. J., Skals, R. K., et al. (2020). Associations of health literacy with socioeconomic position, health risk behavior, and health status: a large national population-based survey among Danish adults. *BMC Public Health* 20, 1–12. doi: 10.1186/s12889-020-08498-8

Taylor, R. D., Oberle, E., Durlak, J. A., and Weissberg, R. P. (2017). Promoting positive youth development through school-based social and emotional learning interventions: a meta-analysis of follow-up effects. *Child Dev.* 88, 1156–1171. doi: 10.1111/cdev.12864

Velten, J., Bieda, A., Scholten, S., Wannemüller, A., and Margraf, J. (2018). Lifestyle choices and mental health: a longitudinal survey with German and Chinese students. *BMC Public Health* 18, 1–15. doi: 10.1186/s12889-018-5526-2

Wang, C., and Burris, M. A. (1997). Photovoice: concept, methodology, and use for participatory needs assessment. *Health Educ. Behav.* 24, 369–387. doi: 10.1177/109019819702400309

World Health Organization (2013). "Health literacy: the solid facts" in *Health literacy: The solid facts*. eds. I. Kickbusch, J. M. Pelikan, F. Apfel and A. D. Tsouros (Copenhagen: World Health Organization)

World Health Organization. (2021). Health literacy in the context of health, well-being and learning outcomes: the case of children and adolescents in schools. Available at: http://apps.who.int/bookorders.

World Health Organization and United Nations Educational, Scientific and Cultural Organization. (2021). Making every school a health-promoting school: global standards and indicators for health-promoting schools and systems. Available at: https://www.who.int/publications/i/item/9789240025059

frontiers | Frontiers in Psychology

TYPE Original Research
PUBLISHED 31 July 2023
DOI 10.3389/fpsyg.2023.1198199

OPEN ACCESS

EDITED BY
Pedro Rosário,
University of Minho, Portugal

REVIEWED BY
Pedro Gil-Madrona,
University of Castilla-La Mancha, Spain
Linda Saraiva,
Polytechnic Institute of Viana do Castelo, Portugal

*CORRESPONDENCE
Guida Veiga
✉ gveiga@uevora.pt

RECEIVED 28 April 2023
ACCEPTED 17 July 2023
PUBLISHED 31 July 2023

CITATION
Dias Rodrigues A, Marmeleira J, Pomar C, Lamy E, Guerreiro D and Veiga G (2023) Body-oriented interventions to promote preschoolers' social–emotional competence: a quasi-experimental study.
Front. Psychol. 14:1198199.
doi: 10.3389/fpsyg.2023.1198199

Body-oriented interventions to promote preschoolers' social–emotional competence: a quasi-experimental study

Andreia Dias Rodrigues[1,2], José Marmeleira[1,2], Clarinda Pomar[3,4], Elsa Lamy[5,6], Daniela Guerreiro[1,2] and Guida Veiga[1,2]*

[1]Departamento de Desporto e Saúde, Escola de Saúde e Desenvolvimento Humano, Universidade de Évora, Évora, Portugal, [2]Comprehensive Health Research Centre (CHRC), Universidade de Évora, Évora, Portugal, [3]Departamento de Pedagogia e Educação, Escola de Ciências Sociais, Universidade de Évora, Évora, Portugal, [4]Centro de Investigação em Educação e Psicologia, Universidade de Évora, Évora, Portugal, [5]MED - Mediterranean Institute for Agriculture, Environment and Development, Universidade de Évora, Évora, Portugal, [6]CHANGE - Global Change and Sustainability Institute, Universidade de Évora, Évora, Portugal

Introduction: Social–emotional competence is foundational to children's health and well-being. Body-oriented interventions, such as relaxation or play based interventions, have been shown to promote social–emotional competence, however more studies are needed to better understand the specific benefits of each type of body-oriented approach.

Objective: The present study aimed to examine the chronic and the acute effects of three body-oriented intervention programs (loose parts play, relaxation and combining loose parts play and relaxation) on preschoolers' social–emotional competence.

Methods: A quasi-experimental study was carried out, including 62 preschoolers (4.44 ± 0.93years) that were allocated into 4 groups: Loose Parts Play program (n=17); Relaxation program (n=17); Combined program (n=13); and Waitlist Control Group (no intervention; n=15). All three intervention programs had a 12-week duration, with biweekly sessions of 30-min, implemented in the preschool outdoors. To examine the chronic effects of the intervention programs, all instruments (parents' and preschool teacher's questionnaires, tasks and saliva) were collected at baseline and after the 12-week period. To examine the acute effects, saliva samples were collected immediately before and after the 1st and the 24th sessions, with a total of 4 collections per child.

Results: Both loose parts play and relaxation interventions significantly improved ($p < 0.05$) children's positive emotion expression. Several within-groups changes were found for the Loose parts play, Relaxation and Combined programs.

Conclusion: Body-oriented interventions effectively promote preschoolers' social–emotional competence.

KEYWORDS

mind–body, loose parts play, relaxation, social–emotional development, children, psychomotor intervention, saliva

1. Introduction

During preschool years, children experience a significant development of social–emotional competence, which is foundational to children's health and well-being (Jones et al., 2015; Cornell et al., 2017; Domitrovich et al., 2017). The school context has proved to be a critical environment where children develop their social–emotional competence, providing a key opportunity to observe and improve children's abilities to interact with peers and preschool teachers as they cooperate and negotiate to complete daily tasks and resolve conflicts (Jones et al., 2015).

The outdoor is a rich context in terms of sensorial and social–emotional experiences, bringing a variety of benefits to children's social–emotional development (Kemple et al., 2016; Tandon et al., 2018). The perceived freedom and space facilitate movement and emotional expression and regulation. Indeed, recent systematic reviews showed that natural environments reduce stress, improve mental health (Tillmann et al., 2018), and facilitate children's social–emotional adaptive behaviors (Mygind et al., 2021; Johnstone et al., 2022).

According to the Collaborative for Academic, Social, and Emotional Learning model, social–emotional competence can be conceptualized in five core clusters: self-awareness, self-management, social awareness, relationship skills, and responsible decision-making, which have a significant role in different aspects of life (Weissberg et al., 2015; Collaborative for Academic, Social, and Emotional Learning, 2020). These five core categories encompass a constellation of other competencies, such as emotion understanding, self-regulation, communication, and problem-solving skills (Denham, 2006; Collaborative for Academic, Social, and Emotional Learning, 2013, 2020). Social–emotional competence at an early age has been positively related to health, positive interpersonal relationships, well-being, and professional success, in the short and in the long-term (Durlak et al., 2011; Jones et al., 2015; Cornell et al., 2017; Eklund et al., 2018). Hence, social–emotional competence has been recognized as a key domain that should be an integral part of early childhood education, such as academic skills (Organization for Economic Co-operation and Development, 2017; Collaborative for Academic, Social, and Emotional Learning, 2020).

Considering the recognized importance of social–emotional competence in the early years, several intervention programs have been implemented within school context aiming to promote preschoolers' social–emotional competence. A recent systematic study (Dias Rodrigues et al., 2022a) has shown that body-oriented interventions effectively promote social–emotional competence, although more studies are needed to better understand the benefits regarding preschool age. Body-oriented interventions are based on the premise that emotional and bodily experiences are associated, aiming to promote the awareness of the body, the connection between the body and emotions, and the body in relation to others (Röhricht, 2009; Bloch-Atefi and Smith, 2014; Rosendahl et al., 2021). Body-oriented interventions encompass different types of approaches, such as play, relaxation, or dance. A recent systematic review (Dias Rodrigues et al., 2022b) revealed that the majority of body-oriented approaches implemented in preschool context are focused on play (10 in the 19 studies included in the review), and other approaches such as relaxation or combined programs (e.g., play and relaxation) are less studied. Such fact highlights the need for more studies focused on the effects of other body-oriented approaches on preschoolers' social–emotional competence (Dias Rodrigues et al., 2022b).

Play has an important role in preschoolers' social–emotional development, and this may explain the fact that play-based interventions are the body-oriented approaches most applied in the preschool context (Dias Rodrigues et al., 2022b). Although most studies focused on the effects of pretend and physical play, research on loose parts play is still scarce (Gibson et al., 2017; Dias Rodrigues et al., 2022b). Implementing loose parts in children's play provide opportunities for free play, allowing children to choose and create their own playful activities, to make independent decisions, and to investigate their social world (Gibson et al., 2017), been also considered important to children's healthy development (Milteer et al., 2012). In this way, loose parts play introduces a range of open-ended and manipulable materials into children's play setting (e.g., stones, sticks, card boxes, clothespins), promoting their engagement (Gull et al., 2019). Research has shown the positive influences of loose parts play parts in children's social–emotional outcomes, such as communication (Maxwell et al., 2008), negotiation skills (Maxwell et al., 2008), social interaction (Hyndman et al., 2014) and cooperation (Flannigan and Dietze, 2017), and problem solving (Flannigan and Dietze, 2017). Despite this, the need for more studies focusing on the effects of loose parts play on preschoolers' social–emotional competence is evident (Gibson et al., 2017; Dias Rodrigues et al., 2022b).

Relaxation is another type of body-oriented intervention that has been implemented in the preschool context. Relaxation intervention programs encompass different techniques aiming to obtain the relaxation response, either through body functions regulation (e.g., breath, tonus) such as breathing techniques or muscular relaxation, and/or through cognitive regulation (e.g., attention) such as mindfulness (Veiga and Marmeleira, 2018). Regardless the technique used, the activities must be adapted to the physical and emotional needs of children (Cooke et al., 2021). Through relaxation children are able to enhance their awareness and regulation of their bodies, emotions, and thoughts (Veiga and Marmeleira, 2018; Cunsolo et al., 2021), as well to face negative stress inductors situations, and look for solutions to better deal with problems (Cunsolo et al., 2021). Despite the lack of studies, in the last few years a growing body of evidence supports the effectiveness of relaxation programs in the educational context, showing the positive influences of relaxation on preschoolers' social–emotional competence, such as emotion regulation (Flook et al., 2015), social competence (Flook et al., 2015; Marmeleira et al., 2018), and behavior problems (Moreno-Gómez and Cejudo, 2018).

Researchers sometimes combine the use of different approaches to gain the strengths of two or more approaches. Hence, there are potential benefits of combining loose parts play and relaxation for preschoolers' social–emotional competence. For example, in Lee et al. (2020), a 1-week program with daily sessions of 70 min that combined loose parts play and mindfulness activities, showed positive effects in almost all the outcomes studied, such as happiness after play, play disruption, play disconnection, play interaction, play intensity, and play skill.

The main purpose of this study was to examine the impact of body-oriented intervention programs on preschoolers' social–emotional competence. More specifically, this study aimed to investigate the chronic and acute effects of three different body-oriented programs, namely Loose parts play, Relaxation, and Combined loose parts play and relaxation program, on preschoolers' social–emotional outcomes. These outcomes include emotion

discrimination, identification, and recognition; positive and negative emotion expression; self-regulation; stress regulation; social competence; externalizing problems; and conflict resolution abilities.

It was hypothesized that preschoolers' social–emotional competence (emotion discrimination, identification, and recognition; positive and negative emotion expression; self-regulation; stress regulation; social competence; externalizing problems; and conflict resolution abilities) would benefit from 12 weeks of the three body-oriented intervention programs and that the programs would produce chronic and acute effects on preschoolers' social–emotional competence.

2. Materials and methods

2.1. Participants

Children were recruited from schools with preschool education, in Évora, Portugal, where the study was carried out. Parents provided written informed consent for participation, and children provided verbal consent. The inclusion criteria were (a) participants' age between 3 and 6 years, (b) do not have participated in a similar intervention program within the last 6 months, and (c) do not have a physical condition that can affect the participation in the program. Sixty-nine informed consents were given to children's parents. Of these, 65 signed informed consents were returned, approving the child's participation in the study. Three of the participants left the kindergarten during the intervention period, and therefore were not included in the study.

Sixty-two preschool aged children participated in the study, being allocated by convenience (i.e., each classroom represented one group) to the Loose Parts Play Group (LPPG, $n = 17$), the Relaxation Group (RG, $n = 17$), the Combined Loose Parts Play and Relaxation Group (CG, $n = 13$), and to the Waitlist Control Group (WCG, $n = 15$).

Table 1 shows the main descriptive characteristics of the participants. There were no significant differences between groups regarding age and sex. All the participants lived in the city of Évora. The majority of the participants (47%, $n = 29$) had one sibling, and 35% ($n = 22$) were only child. The remaining participants had 2 siblings (15%, $n = 9$), or 3 (3%, $n = 2$). More than half of the children (56%, $n = 35$) had their own bedroom, and 85% ($n = 53$) had an outdoor public space in the vicinity of their home where they weekly went to play.

2.2. Procedures

This study was approved by the Ethics Committee of the University of Évora and was carried out under the standards set by the Declaration of Helsinki (General Assembly of the World Medical Association, 2014). All the collected data was fully encrypted to ensure the privacy of the participants.

To examine the chronic effects, data were collected at baseline and at the end of the 12-week period (post-intervention). The tasks were individually applied and presented as games to the children in a quiet room of the kindergarten (10–15 min). Questionnaires were also delivered to parents and preschool teachers.

To measure the acute effects of the intervention programs, salivary cortisol was also measured at the beginning and end of the 1st and the last (24th) sessions. Preschool teachers were asked to restrict children potential cortisol-altering substances 1 h before the testing sessions, such as food and vigorous physical exercise.

TABLE 1 Socio-demographic characteristics of the participants.

	LPPG ($n = 17$)	RG ($n = 17$)	CG ($n = 13$)	WCG ($n = 15$)	Total ($N = 62$)
Age (years)	4.41 ± 1.28	4.35 ± 0.79	4.14 ± 0.69	4.80 ± 0.77	4.44 ± 0.93
Girls (%)	35	53	69	60	53
Boys (%)	65	47	31	40	47

Note: LPPG, loose parts play group; RG, relaxation group; CG, combined group; WCG, waitlist control group.

2.3. Outcomes and measures

2.3.1. Emotional competence

Emotion understanding encompasses the abilities of discrimination, identification, and recognition of emotions (Wiefferink et al., 2013; Rieffe and Wiefferink, 2017). In this way, emotion discrimination was measured through the Emotion-discrimination Task, following Wiefferink et al. (2013; Veiga et al., 2017) protocol. First, two non-emotional sorting tasks (flowers versus cars; heads with hats versus heads with glasses) were applied to reassure the child's ability to sort cards. After completing this control task, the child was asked twice to place six cards, within two possible categories. At first, the cards involved happy versus unhappy faces, and secondly angry versus sad faces were presented. For each card was placed correctly, one point was counted, and scores were averaged, with a minimum score of 0 and a maximum score of 3 points.

Emotion identification was measured through the Emotion-identification Task, also following the protocol of Wiefferink et al. (2013); Veiga et al. (2017). In this task, the child had to point to the facial expressions according to the emotion words (happiness, sadness, fear, and anger) instructed by the experimenter (i.e., "Who looks happy? Who looks sad?"). For each facial emotional expressions that were correctly identified 1 point was counted. Scores were averaged to reflect a total score from 0 to 2.

Emotion recognition was measured through the subscale Others' Emotion Recognition (6 items) of the Portuguese version of the Emotion Expression Questionnaire (EEQ; Rieffe et al., 2010; Veiga et al., 2017). This subscale is comprised by 6 items (e.g., "Does your child know when you are angry?," "Does your child know when you are happy?") scored in a 5-point scale [0 = (almost) never, 1 = rarely, 2 = sometimes, 3 = often, 4 = (almost) always], rated by parents regarding the extent to which the child can recognize parents' or others' emotions. Scores were averaged to reflect a total score from 0 to 4. The reliability of this subscale was acceptable with Cronbach's alpha value of 0.75, and also the inter-item correlation value (0.36).

Positive emotion expression, and negative emotion expression was measured through the Positive Emotion Expression subscale (6 items) and Negative Emotion Expression subscale (8 items) from the EEQ (Rieffe et al., 2010; Veiga et al., 2017). Parents scored on a 5-point scale [0 = (almost) never, 1 = rarely, 2 = sometimes, 3 = often, 4 = (almost) always], the frequency, intensity, and duration of child's expressions of positive emotions such as happiness or joy (e.g., "How often does your child experience joy?," "How happy is your child?"), and negative emotions such as anger or sadness (e.g., "How often

does your child experience fear?," "How angry is your child?"). Scores were averaged. The reliability of positive and negative emotion expression subscales was acceptable and good, respectively, with Cronbach's alpha value of 0.71 and 0.81. The inter-item correlation values were acceptable (0.20 and 0.34, respectively).

Self-regulation was measured through the Portuguese version of Head-Toes-Knees-Shoulders task (HTKS; Ponitz et al., 2009; Cadima et al., 2015). HTKS has three sections with up to four paired behavioral rules: "touch your head" and "touch your toes"; "touch your shoulders" and "touch your knees." In the first section, the child is instructed to touch her head and toes in an opposite manner from what she is instructed (e.g., when the child is asked to touch the feet, he/she should touch the head). The child is asked to keep doing the opposite of the interviewer command throughout the test. In the second section, knees and shoulders are added. In the third section, the rules are switched so that head and knees go together, and shoulders and toes go together. Each section includes 10 trials, and for each trial, the child received a score of 0 (incorrect), 1 (self-correct), or 2 (correct). Scores were summed to reflect a total score from 0 to 60.

Stress regulation was measured through salivary cortisol levels (μg/dl). Saliva samples were collected at the same time and in the same place where the interventions occurred, before and after the 1st and 24th sessions, with a total of 4 collections per child. Samples were collected directly from each child's mouth, without stimulation, by passive droll during 5 min to a polyethylene tube. Then, the tube was maintained on ice and further kept at −20°C, until laboratory analysis. For the analyses, samples were thawed and then centrifuged for 20 min at 13000 g, 4°C, for removal of food debris, mucins, and cells. After this process, cortisol determination was performed using the Salimetrics® Cortisol Enzyme Immunoassay (EIA) Kit, following manufacturer instructions and absorbance reading was carried out at 450 nm, in a microplate reader (Glomax, Promega).

2.3.2. Social competence

Social competence was obtained through the Portuguese version of the Strengths and Difficulties Questionnaire (SDQ; Goodman, 1997; Muris et al., 2003), combining the prosocial behaviors scale (5 items), and the positive items of the peer problems scale (2 items) (Veiga et al., 2017). The SDQ was administered to preschool teachers and parents, who rated on a 3-point scale (0 = not true, 1 = somewhat true, and 2 = certainly true) the degree to which each item represented the child's behavior in the last 3 months. Scores were averaged to reflect a total score from 0 to 2. This scale showed good and acceptable reliability, with a Cronbach's alpha of 0.84 for preschool teachers' and of 0.73 for parents' measurements. The inter-item correlations values for both questionnaires were good (0.45 and 0.29, respectively).

Externalizing problems were also obtained through the procedure of Veiga et al. (2017), combining the behavior problems scale (5 items), and hyperactivity scale (5 items) of the Strengths and Difficulties Questionnaire (SDQ; Goodman, 1997; Muris et al., 2003). Parents rated on a 3-point scale (0 = not true, 1 = somewhat true, and 2 = certainly true) the degree to which each item represented the child's behavior in the last 3 months. Scores were summed to reflect a total score from 0 to 2. This scale showed acceptable reliability with Cronbach's alpha value of 0.71, and an inter-item correlation value also acceptable (0.18).

Conflicts resolution was measured through the conflict resolution strategies subscale (6 items) of the Portuguese version of Social Strategies Rating Scale (SSRS; Beckman and Lieber, 1994; Fialho and Aguiar, 2017). The SSRS was administered to preschool teachers, who rated on a 5-point scale (1 = never, 3 = half of the time, 5 = almost always) how often the child uses social strategies during interactions with peers on preschool context. Scores were summed to reflect a total score from 1 to 5. This scale showed good reliability with a Cronbach's alpha value of 0.83, and a good inter-item correlation (0.43).

2.4. Intervention programs

All the intervention programs (loose parts play, relaxation, combined) were implemented by a psychomotor therapist in the school playground (except for the days when it rained, being implemented in the classroom) involving the whole class. All sessions had a 30-min and were carried out twice a week for 12 weeks.

The Loose parts play program sessions began with an initial dialogue (2 min), a main section (25 min), and a final ritual (3 min). During the main section, participants played freely with any loose parts available in the playground. At the beginning of the program, smaller loose parts (e.g., card boxes of small sizes, bottle caps of different sizes and colors, sticks, stones, fabric, bottles, clothes springs) were introduced, affording (mostly solitary) object exploration, and therefore stimulating children's curiosity and awareness of their bodies in action. As the sessions progressed, bigger loose parts (e.g., larger card boxes, tires, tape, strings, demijohns, tubes) were added. As the exploration and use of bigger materials require more children, collaborative and social behaviors were therefore afforded. Nevertheless, it is important to note that despite the different loose parts, children had total freedom to choose, decide and structure their own play.

The Relaxation program was structured with an initial dialogue (2 min), a main section (25 min), and a final ritual (3 min). During the main section, relaxation activities focused on Jacques Choque Method (Choque, 1994) were implemented, being adapted to the interests of the intervention group (e.g., using favorite fictional characters or animals, music, or other activities that can be adapted to the goals of the programs, such as "Captain's Orders"). An example of one activity was the "Balloon belly breathing," where children had to imagine that they belly was a balloon, and while they breath in the balloon gets bigger, and when they breath out the balloon empties. All the children were actively engaged in all the activities. The goals of the intervention program were organized in four cumulative stages: (a) promotion of body and emotion awareness – 1st to 6th sessions; (b) promotion of self-regulation – 7th to 12th sessions; (c) promotion of the awareness of others' emotions (13th to 18th sessions); and (d) promotion of the body in relation with others and problem solving abilities, which means helping in the creation and maintenance of positive interpersonal relationships (19th to 24th sessions). As the program progressed, activities complexity was increased (e.g., at the beginning, stretching activities were focused on a smaller number of muscle groups, but as the sessions progressed, a greater number of muscle groups were combined), as well the need of cooperation with peers. In particular, while at the beginning of the program the activities were individually performed, as the sessions progressed, activities gradually involved more peers (from pairs to the whole group).

The Combined program was structured with an initial dialogue (3 min), a loose parts play moment (15 min), a relaxation moment

(10 min), and a final ritual (2 min). The loose parts play moment followed the same principles describe above regarding the Loose parts play intervention program, as well as the moment of relaxation, which was comprised by 2 relaxation activities per session.

All sessions were planned and conducted by a psychomotor therapist and the preschool teacher was available to children during the intervention sessions.

The WCG participants maintained their usual daily live activities during the intervention period.

2.5. Statistical analyses

Psychometric properties of the questionnaires used to assess emotion recognition, positive and negative emotion expression, social competence, externalizing problems, and conflict resolution were examined through Cronbach's alpha coefficient and item-total correlation.

A descriptive analysis (frequencies, means and SD) and normality tests (Shapiro–Wilk test) were performed for all the variables. As the majority of the variables did not have a normal distribution, non-parametric Kruskal–Wallis *H* tests (one-way ANOVA on ranks) with a *post hoc* test (pairwise comparisons) were carried out to compare between group changes after the intervention program. Significance levels were adjusted using the Bonferroni correction for multiple comparisons. Scores were tested for change over time using *post hoc* pairwise comparisons with the Mann–Whitney test with a Bonferroni adjustment applied to compensate for the multiple comparisons between four groups, and significance was set at $p < 0.0083$ (0.05/6 comparisons = 0.0083). Changes within groups were examined using the Wilcoxon Signed test, and significance was set at $p < 0.05$. The results are expressed as median and interquartile range (IQR).

Analyses were conducted with the statistical software Statistical Package for the Social Sciences (Version 27.0; IBM SPSS Inc.).

3. Results

All schools contacted to implement the programs accepted to participate in the study. All intervention programs had good compliance, exceeding 83% (20 in 24 sessions) in the Loose parts play program, 71% (17 in 24 sessions) in the Relaxation program, and 79% (19 in 24 sessions) in the Combined program. Children's absence was related to school absence on the days those sessions occurred. Although children were informed that they were free to not participate in the sessions, that never happened.

3.1. Emotional competence

As shown in Table 2 the groups did not show statistically significant differences in the dependent outcomes at baseline. Kruskal–Wallis test showed that median emotion discrimination and emotion identification scores were not statistically significantly different between the groups. Statistically significant increases were found in emotion discrimination scores from baseline to 12 weeks in the LPPG ($\Delta Mdn = 0.75$, $z = -2.82$, $p = 0.005$), RG ($\Delta Mdn = 0.75$, $z = -2.80$, $p = 0.005$), in CG ($\Delta Mdn = 1.00$, $z = -2.95$, $p = 0.003$) and in the WCG ($\Delta Mdn = 0.25$, $z = -2.04$, $p = 0.041$).

Statistically significant increases were found in emotion identification scores from baseline to 12 weeks in the LPPG ($\Delta Mdn = 0.25$, $z = -3.09$, $p = 0.002$), RG ($\Delta Mdn = 0.25$, $z = -2.89$, $p = 0.004$), and in the CG ($\Delta Mdn = 0.25$, $z = -2.38$, $p = 0.018$).

Kruskal–Wallis test showed that median emotion recognition scores were statistically significantly different between the different groups, $\chi 2(3) = 8.038$, $p = 0.045$. Subsequently, *post hoc* test did not reveal significant differences between groups. Despite this, within group analyses revealed a statistically significant increase in RG emotion recognition scores from baseline to 12 weeks ($\Delta Mdn = 0.33$, $z = -2.10$, $p = 0.035$).

Positive emotion expression scores were statistically significantly different between the different groups, $\chi 2(3) = 17.563$, $p < 0.001$. *Post hoc* analysis revealed statistically significant differences in this outcome between the LPPG ($\Delta Mdn = 0.17$) and the WCG scores ($\Delta Mdn = -0.17$) ($p = 0.006$), and the RG ($\Delta Mdn = 0.33$) and the WCG scores ($\Delta Mdn = -0.17$) ($p = 0.002$). Within group analysis showed that statistically significant increases were observed from baseline to 12 weeks in the LPPG ($\Delta Mdn = 0.17$, $z = -2.10$, $p = 0.035$), and in the RG ($\Delta Mdn = 0.33$, $z = -2.16$, $p = 0.031$). We also observed a statistically significant decrease from baseline to 12 weeks in the WCG ($\Delta Mdn = -0.17$, $z = -2.41$, $p = 0.016$).

In self-regulation no statistically significant differences were observed between groups, but Wilcoxon signed-rank test revealed that self-regulation scores significantly increased from baseline to 12 weeks in the LPPG ($\Delta Mdn = 6.00$, $z = -2.73$, $p = 0.006$), RG ($\Delta Mdn = 12.00$, $z = -2.82$, $p = 0.005$), and in the CG ($\Delta Mdn = 9.00$, $z = -2.67$, $p = 0.008$).

3.2. Social competence

As shown in Table 3, at baseline, the groups did not show statistical differences in most of the dependent outcomes. The exceptions were: the outcome 'social competence' reported by preschool teachers, in which the LPPG had 0.58 more points than the CG, and the WCG had 0.58 more points than the CG; and 'conflict resolution', in which the WCG had 1.34 more points than the RG.

Social competence scores reported by preschool teachers were statistically significantly different between the different groups, $\chi 2(3) = 14.001$, $p = 0.003$. *Post hoc* analysis revealed statistically significant differences in this outcome between the LPPG ($\Delta Mdn = -0.43$) and the RG scores ($\Delta Mdn = 0.00$) ($p = 0.002$). Within group analysis showed that statistically significant decreases were observed from baseline to 12 weeks in the LPPG ($\Delta Mdn = -0.43$, $z = -3.05$, $p = 0.002$), and in the WCG ($\Delta Mdn = -0.14$, $z = -2.60$, $p = 0.010$).

Statistically significantly differences were found between groups in conflict resolution, $\chi 2(3) = 12.360$, $p = 0.006$. Despite *post hoc* analysis did not reveal between each group occurred this significant difference, within group analysis revealed a significant decrease of conflict resolution from baseline to 12 weeks in the WCG ($\Delta Mdn = -0.67$, $z = -2.60$, $p = 0.010$).

Despite the nonexistence of statistically significant differences between groups regarding social competence reported by parents, and externalizing behaviors, within group analysis revealed a significant increase of social competence from baseline to 12 weeks in the RG

10.3389/fpsyg.2023.1198199

TABLE 2 Scores on the emotion discrimination, emotion identification, emotion recognition, positive emotion expression, negative emotion expression, and behavioral self-regulation at baseline and at 12 weeks.

Emotional competence (Min-Max)	Group	Baseline *Mdn* (IQR)	12 weeks *Mdn* (IQR)	Kruskal–Wallis test value of *p*	*Post hoc* test[‡]
Emotion discrimination (0–3)	LPPG	2.00 (1.12)	2.75 (0.75)**	0.31	
	RG	2.00 (1.00)	2.75 (1.00)**		
	CG	1.75 (1.13)	2.75 (0.50)**		
	WCG	1.25 (1.00)	2.00 (0.50)*		
Emotion identification (0–2)	LPPG	1.75 (1.13)	2.00 (0.00)**	0.25	
	RG	1.50 (1.13)	2.00 (0.00)**		
	CG	1.75 (0.75)	2.00 (0.00)*		
	WCG	1.50 (0.50)	1.75 (0.75)		
Emotion recognition (0–4)	LPPG	2.83 (1.34)	2.83 (1.25)	0.04[†]	
	RG	2.67 (1.00)	2.83 (0.67)*		
	CG	2.83 (0.50)	2.83 (1.08)		
	WCG	2.83 (0.67)	3.00 (0.67)		
Positive emotion expression (0–4)	LPPG	3.33 (0.58)	3.50 (0.25)*	<0.001	LPPG > CG
	RG	3.17 (0.58)	3.67 (0.17)*		RG > CG
	CG	3.33 (0.58)	3.33 (0.58)		
	WCG	3.50 (0.50)	3.17 (0.50)*		
Negative emotion expression (0–4)	LPPG	1.28 (1.21)	1.28 (0.78)	0.34	
	RG	1.86 (1.07)	1.86 (0.57)		
	CG	1.14 (0.36)	1.28 (0.36)		
	WCG	1.86 (0.86)	1.28 (0.56)		
Self-regulation (0–60)	LPPG	4.00 (16.50)	19.00 (34.00)**	0.28	
	RG	1.00 (6.50)	13.00 (28.50)**		
	CG	2.00 (4.00)	19.00 (31.00)**		
	WCG	4.00 (12.00)	2.00 (24.00)		

Note: Data are expressed as median and interquartile range (IQR). *$p < 0.05$, **$p \leq 0.01$, changes within the group using the Wilcoxon test. [‡]Pairwise comparisons of change scores using Mann–Whitney test. [†]Kruskal–Wallis H test statistically significant, but no statistically significant pairwise comparisons were found. LPPG, loose parts play group; RG, relaxation group; CG, combined group; WCG, waitlist control group.

($\Delta Mdn = 0.14$, $z = -2.57$, $p = 0.010$), and in externalizing behaviors in the WCG ($\Delta Mdn = -0.10$, $z = -2.60$, $p = 0.011$).

Regarding the acute effects in salivary cortisol levels, as shown in Table 4, there was statistical differences at 24th pre-session between LPPG and RG, in which the LPPG had more 0.09 μg/dL than RG. Results show no significant difference between salivary cortisol concentration at 1st and 24th pre-session and post-session. Despite this, in the 24th session, the salivary cortisol concentration significantly decreased from pre-session to post-session in the LPPG ($\Delta Mdn = -0.10$, $z = -2.60$, $p = 0.010$).

4. Discussion

The present study aimed to examine the effects of three body-oriented interventions on preschoolers' social–emotional competence. Both Loose parts play and Relaxation programs increased preschoolers' positive emotion expression and several within-groups changes were found for the Loose parts play, the Relaxation and the Combined programs, suggesting the effectiveness of the three programs to promote emotion discrimination and identification, and self-regulation. From baseline to post-intervention, both Loose parts play and Relaxation programs improved children's positive emotion expression but only children from the relaxation group improved their social competence. Throughout the intervention period, children from the control group decreased their conflict resolution abilities and increased externalizing problems.

All schools that were contacted to implement the programs accepted to participate in the study. Such high level of acceptance might be related to the recognition of the importance of social–emotional development by early-childhood education professionals. Also, preschool teachers seem to acknowledge the critical role of outdoor time for preschoolers' health and well-being. Moreover, the low time commitment (two biweekly 30-min sessions) might have facilitated the acceptance of the program.

The mean attendance rate of children to the programs was 82%, which is considered a good rate comparing to other body-oriented intervention programs (Goldstein and Lerner, 2017). Children were informed that they were free to engage in other activities, during the session time. However, this never happened and children always choose

10.3389/fpsyg.2023.1198199

TABLE 3 Scores on social competence, externalizing problems, and conflict resolution at baseline and at 12 weeks.

Social competence (Min–Max)	Group	Baseline *Mdn* (IQR)	1 weeks *Mdn* (IQR)	Kruskal–Wallis test value of *p*	*Post hoc* test‡
Social competence (PT) (0–2)	LPPG	1.86 (0.29)[a]	1.43 (0.57)**	0	RG > LPPG
	RG	1.71 (0.58)	1.86 (0.50)		
	CG	1.28 (0.71)[a,b]	1.14 (0.86)		
	WCG	1.86 (0.20)[b]	1.57 (0.58)**		
Social competence (P) (0–2)	LPPG	1.71 (0.50)	1.86 (0.29)	0.21	
	RG	1.71 (0.43)	2.00 (0.22)**		
	CG	1.86 (0.50)	1.86 (0.36)		
	WCG	1.71 (0.43)	1.86 (0.57)		
Externalizing problems (P) (0–2)	LPPG	0.90 (0.55)	1.86 (0.29)	0.24	
	RG	0.80 (0.65)	2.00 (0.22)		
	CG	0.50 (0.60)	1.86 (0.35)		
	WCG	0.80 (0.10)	1.86 (0.58)*		
Conflict resolution (PT) (1–5)	LPPG	3.50 (1.50)	3.17 (1.58)	0.01†	
	RG	2.83 (0.83)[a]	3.50 (1.50)		
	CG	3.17 (1.08)	3.67 (1.17)		
	WCG	4.17 (1.17)[a]	3.17 (1.00)**		

Note: Data are expressed as median and interquartile range (IQR). **$p \leq 0.01$changes within the group using the Wilcoxon test. ‡Pairwise comparisons of change scores using Mann–Whitney test ($p < 0.05$). [a,b] $p < 0.05$ comparison between groups at baseline through Kruskal–Wallis *H* test. PT, preschool teachers; P, parents; LPPG, loose parts play group; RG, relaxation group; CG, combined group; WCG, waitlist control group.

TABLE 4 Scores on cortisol at pre-and post-session.

Cortisol	Group	Pre-session *Mdn* (IQR)	Post-session *Mdn* (IQR)	Kruskal–Wallis *H* value of *p*
Session 1	LPPG	0.23 (0.11)	0.16 (0.04)	0.87
	RG	0.15 (0.11)	0.11 (0.11)	
	CG	0.08 (0.13)	0.11 (0.05)	
Session 24	LPPG	0.21 (0.17)[a]	0.15 (0.09)*	0.09
	RG	0.12 (0.07)[a]	0.09 (0.05)	
	CG	0.11 (0.14)	0.13 (0.14)	

Note: Data are expressed as median and interquartile range (IQR). [a]$p < 0.05$ comparison between groups at baseline. *$p < 0.05$ changes within the group using the Wilcoxon test. LPPG, loose parts play group; LPP, loose parts play group; CG, combined group.

to participate in the sessions, showing highly motivated to participate. Hence, the level of attendance reveals school absence. A high level of motivation may be related to the fact that sessions enabled children to engage in active and playful activities that they were not used to engaging. Moreover, sessions were implemented in the outdoors and therefore were an opportunity to be outside, and to experience the freedom of movement and expression. Also, especially in the Loose parts play program and in the Combined program, children had the chance to play with original objects/materials that there were not used. Finally, the warm presence of the psychomotor therapist and the preschool teacher might have been important to the high level of motivation.

In what concerns to the effects of the three body-oriented programs, our findings showed that both Loose parts play and Relaxation programs effectively increased positive emotion expression. Although studies with older school aged children had already shown the positive effects of a relaxation intervention on the expression of positive emotions (Alba, 2013; Lindsay et al., 2018), this is the first study to extend these findings to younger children. In fact, relaxation states have been related to positive emotions. In particular, when children are calm and more relaxed, they can experience and express more positive emotions (Amutio et al., 2015; Fredrickson et al., 2017). It is important to note the active and playful dimension of the relaxation intervention implemented. Such physical activity and playfulness (Chang et al., 2013) might have also benefited positive emotion expression.

In what concerns to the effects of the Loose parts play program on children's expression of positive emotions, the perceived freedom throughout the session, might have facilitated the experience and expression of positive emotional states. Although two other studies had already shown that play-based intervention programs effectively promote children's positive emotion expression (Moore and Russ, 2008; Rao and Gibson, 2021), these studies did not focus on loose parts play (i.e., pretend play; Moore and Russ, 2008) or combined play with other body-oriented approaches (i.e., loose parts play and mindfulness; Lee et al., 2020). Altogether these findings reinforce the potential of loose parts play to promote children's positive emotion expression.

Considering the positive effects of both body-oriented approaches (Loose parts play and Relaxation) on children's positive emotion expression, the lack of effects of the Combined intervention program was not expected. Such finding may be explained by the reduced time available for both approaches (15 min for loose parts play, 10 min for relaxation), considering that in a previous study focused on a combined program, the loose parts play part had an hour duration (Lee et al., 2020).

Our findings suggest that relaxation might be the best body-oriented approach to promoting social competence. The relaxation

program involved a progression in terms of the activities' social level. The first sessions comprised individual relaxation activities, then sessions progressed to activities in pairs, and later to group activities. Such progression, embedded in a playful atmosphere, might have benefited the development of social skills. These findings are in line with a previous study that showed the effectiveness of a 12-week mindfulness intervention on preschoolers' social competence (Flook et al., 2015).

Our findings also showed that all the intervention programs effectively improved emotion discrimination and identification, which goes in line with a previous study showing that relaxation (Richard et al., 2019) enhances emotion understanding. However, only the Relaxation program effectively increased children's emotion recognition. Contrary to the discrimination and identification tasks, emotion recognition was assessed through parents' perspectives on children's abilities to recognize their parents' emotional expressions. In the Relaxation program children were first guided to observe and become aware of their own body sensations and expressions, and later to observe others' bodies and expressions, and to establish the relationship between bodily and emotional states. Such focus and progression might have been important for children to become attentive and aware of others' emotion expressions. Nevertheless, the lack of effects of the combined program on emotion recognition suggests that these gains require time and orientation, since the combined program only involved a 10-min relaxation practice.

Although a recent systematic review showed contradictory findings for the benefits of body-oriented interventions in preschoolers' self-regulation (Dias Rodrigues et al., 2022b), our findings show that, after the 12-week intervention period, the three intervention groups showed an improved self-regulation measured by the HTKS, in comparison to the control group who showed decreased self-regulation. These findings are in line with previous studies (Chinekesh et al., 2014; Duman and Ozkur, 2019; Loukatari et al., 2019) and reinforce the idea that integrating specific outdoor body-oriented moments in the early-childhood curriculum are critical for preschoolers' self-regulation development.

Concerning self-regulation measured by salivary cortisol levels, there were no significant differences between groups neither before nor after the intervention period. Also, cortisol levels measured throughout the 1st session, did not vary in any of the programs. However, it is important to note the significant decrease in salivary cortisol levels during the 24th session of the Loose parts play program. Such a decrease suggests that children who had more opportunities to freely play with loose parts, improved their ability to reduce physiological arousal, unlike the other intervention groups. It is important to note that contrary to Relaxation and Combined sessions, Loose part play sessions were child-directed. Hence, the experienced freedom during loose parts play intervention might be particularly beneficial for children's self-regulation.

5. Limitations and future research

This study has some limitations. Participants' allocation to the groups was not randomized. Besides, the small sample size influences the observation of positive effects. Henceforth, future studies should consider replicating of the present study with a random allocation, and a higher sample size. Besides, it is important to run a follow-up evaluation in order to examine the long-term effects of the intervention programs.

6. Implications and conclusion

This study examined the effects of three body-oriented intervention programs on preschoolers' social–emotional competence. Both Loose parts play and Relaxation programs increased preschoolers' positive emotion expression and several within-groups improvements were found for the loose parts play, relaxation and combined programs, suggesting the potential effectiveness to promote emotion discrimination and identification, and self-regulation. This study reinforces the importance of integrating outdoor and body-oriented approaches into the preschool curriculum for children's social–emotional development.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Ethics statement

The studies involving human participants were reviewed and approved by University of Évora Ethics Committee. Written informed consent to participate in this study was provided by the participants' legal guardian/next of kin.

Author contributions

ADR, GV, JM, and CP contributed to the design and conception of this study and cautiously designed the intervention program. GV, JM, and CP supervised the implementation of the study. ADR collected the data, which was analyzed by ADR, GV, and JM. EL performed the saliva analyses. ADR wrote the first draft of the manuscript. ADR, GV, JM, EL, DG, and CP contributed to manuscript revision, read, and approved the submitted version. All authors contributed to the article and approved the submitted version.

Funding

This work was funded by national funds through the Foundation for Science and Technology, under the project UIDP/04923/2020.

Acknowledgments

We would like to thank the schools, preschool teachers, families, and children who participated in this study.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Publisher's note

References

Alba, B. (2013). Loving-kindness meditation: a field study. *Contemporary Buddhism* 14, 187–203. doi: 10.1080/14639947.2013.832494

Amutio, A., Martínez-Taboada, C., Hermosilla, D., and Delgado, L. C. (2015). Enhancing relaxation states and positive emotions in physicians through a mindfulness training program: a one-year study. *Psychol. Health Med.* 20, 720–731. doi: 10.1080/13548506.2014.986143

Beckman, P. J., and Lieber, J. (1994). The social strategy rating scale: an approach to evaluating social competence. *J. Early Interv.* 18, 1–11. doi: 10.1177/105381519401800101

Bloch-Atefi, A., and Smith, J. (2014). The effectiveness of body-oriented psychotherapy: a review of the literature. *Psychother. Counsel. J. Australia* 3, 1–37. doi: 10.59158/001c.71153

Cadima, J., Gamelas, A. M., McClelland, M., and Peixoto, C. (2015). Associations between early family risk, children's behavioral regulation, and academic achievement in Portugal. *Early Educ. Dev.* 26, 708–728. doi: 10.1080/10409289.2015.1005729

Chang, P., Qian, X., and Yarnal, C. (2013). Using playfulness to cope with psychological stress: taking into account both positive and negative emotions. *Int. J. Play* 2, 273–296. doi: 10.1080/21594937.2013.85541

Chinekesh, A., Kamalian, M., Eltemasi, M., Chinekesh, S., and Alavi, M. (2014). The effect of group play therapy on social-emotional skills in pre-school children. *Global J. Health Sci.* 6, 163–167. doi: 10.5539/gjhs.v6n2p163

Choque, J. (1994). Concentration et relaxation pour les enfants. Paris: *Michel Albim.*

Collaborative for Academic, Social, and Emotional Learning. (2013). The 2013 CASEL guide: effective social and emotional learning programs-preschool and elementary school edition. CASEL. Available at: https://casel.org/resources-learn/

Collaborative for Academic, Social, and Emotional Learning. (2020). Resources: SEL background and research. Available at: https://casel.org/resources-learn/

Cooke, E., Houen, S., Nuttall, G., Thorpe, K., and Staton, S. (2021). Supporting Children's relaxation in early childhood education and care. *Support. Early Child. Educ. Care* 2, 1–2.

Cornell, C., Kiernan, N., Kaufman, D., Dobee, P., Frydenberg, E., and Deans, J. (2017). "Developing social emotional competence in the early years," in *Social and emotional learning in Australia and the Asia-Pacific: Perspectives, programs and approaches*. eds. E. Frydenberg, A. Martin and R. Collie. Singapore: Springer. doi: 10.1007/978-981-10-3394-0_21

Cunsolo, S., Cebotari, V., Richardson, D., and Vrolijk, M. (2021). How relaxing develops and affects well-being throughout childhood. *UNICEF* 2021, 1–33.

Denham, S. A. (2006). Social–emotional competence as support for school readiness: what is it and how do we assess it? *Early Educ. Dev.* 17, 57–89. doi: 10.1207/s15566935eed1701_4

Dias Rodrigues, A., Cruz-Ferreira, A., Marmeleira, J., Laranjo, L., and Veiga, G. (2022b). Which types of body-oriented interventions promote preschoolers' social-emotional competence? A Systematic Review. *Healthcare* 10:2413. doi: 10.3390/healthcare10122413

Dias Rodrigues, A., Cruz-Ferreira, A., Marmeleira, J., and Veiga, G. (2022a). Effects of body-oriented interventions on Preschoolers' social-emotional competence: a systematic review. *Front. Psychol.* 12:752930. doi: 10.3389/fpsyg.2021.752930

Domitrovich, C. E., Durlak, J. A., Staley, K. C., and Weissberg, R. P. (2017). Social-emotional competence: an essential factor for promoting positive adjustment and reducing risk in school children. *Child Dev.* 88, 408–416. doi: 10.1111/cdev.12739

Duman, G., and Ozkur, F. (2019). Analysing the embedded learning-based movement education program's effects on preschool children's visual-motor coordination and self-regulation. *J. Educ. Learn.* 8, 193–202. doi: 10.5539/jel.v8n5p193

Durlak, J. A., Weissberg, R. P., Dymnicki, A. B., Taylor, R. D., and Schellinger, K. B. (2011). The impact of enhancing students' social and emotional learning: a meta-analysis of school-based universal interventions. *Child Dev.* 82, 405–432. doi: 10.1111/j.l467-8624.2010.01564.x

Eklund, K., Kilpatrick, K. D., Kilgus, S. P., and Haider, A. (2018). A systematic review of state-level social-emotional learning standards: implications for practice and research. *Sch. Psychol. Rev.* 47, 316–326. doi: 10.17105/SPR-2017.0116.V47-3

Fialho, M., and Aguiar, C. (2017). Escala de Avaliação das estratégias sociais: um estudo de validação com crianças em idade pré-escolar. *Análise Psicol* 35, 101–115. doi: 10.14417/ap.1198

Flannigan, C., and Dietze, B. (2017). Children, outdoor play, and loose parts. *J. Childhood Stud.* 42, 53–60. doi: 10.18357/jcs.v42i4.18103

Flook, L., Goldberg, S. B., Pinger, L., and Davidson, R. J. (2015). Promoting prosocial behavior and self-regulatory skills in preschool children through a mindfulness-based kindness curriculum. *Dev. Psychol.* 51, 44–51. doi: 10.1037/a0038256

Fredrickson, B. L., Boulton, A. J., Firestine, A. M., Van Cappellen, P., Algoe, S. B., Brantley, M. M., et al. (2017). Positive emotion correlates of meditation practice: a comparison of mindfulness meditation and loving-kindness meditation. *Mindfulness* 8, 1623–1633. doi: 10.1007/s12671-017-0735-9

General Assembly of the World Medical Association (2014). World medical association declaration of Helsinki: ethical principles for medical research involving human subjects. *J. Am. Coll. Dent.* 81, 14–18.

Gibson, J. L., Cornell, M., and Gill, T. (2017). A systematic review of research into the impact of loose parts play on children's cognitive, social and emotional development. *Sch. Ment. Heal.* 9, 295–309. doi: 10.1007/s12310-017-9220-9

Goldstein, T. R., and Lerner, M. D. (2017). Dramatic pretend play games uniquely improve 591 emotional control in young. *Dev. Sci.* 21:e12603. doi: 10.1111/desc.12603

Goodman, R. (1997). The strengths and difficulties questionnaire: a research note. *J. Child Psychol. Psychiatry* 38, 581–586. doi: 10.1111/j.1469-7610.1997.tb01545.x

Gull, C., Bogunovich, J., Goldstein, S., and Rosengarten, T. (2019). Definitions of loose parts in early childhood outdoor classrooms: a scoping review. *Int. J. Early Child.* 6, 37–52.

Hyndman, B., Benson, A., Ullah, S., and Telford, A. (2014). Evaluating the effects of the lunchtime enjoyment activity and play (LEAP) school playground intervention on children's quality of life, enjoyment and participation in physical activity. *BMC Public Health* 14, 1–16. doi: 10.1186/1471-2458-14-164

Johnstone, A., Martin, A., Cordovil, R., Fjørtoft, I., Iivonen, S., Jidovtseff, B., et al. (2022). Nature-based early childhood education and children's social, emotional and cognitive development: a mixed-methods systematic review. *Int. J. Environ. Res. Public Health* 19:5967. doi: 10.3390/ijerph19105967

Jones, D. E., Greenberg, M., and Crowley, M. (2015). Early social-emotional functioning and public health: the relationship between kindergarten social competence and future wellness. *Am. J. Public Health* 105, 2283–2290. doi: 10.2105/AJPH.2015.302630

Kemple, K. M., Oh, J. H., Kenney, E., and Smith-Bonahue, T. (2016). The power of outdoor play and play in natural environments. *Child. Educ.* 92, 446–454. doi: 10.1080/00094056.2016.1251793

Lee, R. L., Lane, S. J., Tang, A. C., Leung, C., Louie, L. H., Browne, G., et al. (2020). Effects of an unstructured free play and mindfulness intervention on wellbeing in kindergarten students. *Int. J. Environ. Res. Public Health* 17:5382. doi: 10.3390/ijerph17155382

Lindsay, E. K., Chin, B., Greco, C. M., Young, S., Brown, K. W., Wright, A. G., et al. (2018). How mindfulness training promotes positive emotions: dismantling acceptance skills training in two randomized controlled trials. *J. Pers. Soc. Psychol.* 115, 944–973. doi: 10.1037/pspa0000134

Loukatari, P., Matsouka, O., Papadimitriou, K., Nani, S., and Grammatikopoulos, V. (2019). The effect of a structured playfulness program on social skills in kindergarten children. *Int. J. Instr.* 12, 237–252. doi: 10.29333/iji.2019.12315a

Marmeleira, J., Liberal, C., and Veiga, G. (2018). A prática de relaxação promove o desenvolvimento sócio-emocional de crianças em idade pré-escolar. In *Estudos em desenvolvimento motor da criança XI*. eds. P. Rodrigues, A. Rebolo, F. Vieira, A. Dias and L. Silva Almada: Edições Piaget, 197–203.

Maxwell, L. E., Mitchell, M. R., and Evans, G. W. (2008). Effects of play equipment and loose parts on preschool children's outdoor play behavior: an observational study and design intervention. *Child. Youth Environ.* 18, 36–63.

Milteer, R. M., Ginsburg, K. R., Council on Communications and Media Committee on Psychosocial Aspects of Child and Family HealthMulligan, D. A., Ameenuddin, N., Brown, A., et al. (2012). The importance of play in promoting healthy child development and maintaining strong parent-child bond: focus on children in poverty. *Pediatrics* 129, e204–e213. doi: 10.1542/peds.2011-2953

Moore, M., and Russ, S. W. (2008). Follow-up of a pretend play intervention: effects on play, creativity, and emotional processes in children. *Creat. Res. J.* 20, 427–436. doi: 10.1080/10400410802391892

Moreno-Gómez, A. J., and Cejudo, J. (2018). Effectiveness of a mindfulness-based social–emotional learning program on Psychosocial adjustment and neuropsychological maturity in kindergarten children. *Mindfulness* 10, 111–121. doi: 10.1007/s12671-018-0956-6

Muris, P., Meesters, C., and Van den Berg, F. (2003). The strengths and difficulties questionnaire (SDQ): further evidence for its reliability and validity in a community sample of Dutch children and adolescents. *Eur. Child Adolesc. Psychiatry* 12, 1–8. doi: 10.1007/s00787-003-0298-2

Mygind, L., Kurtzhals, M., Nowell, C., Melby, P. S., Stevenson, M. P., Nieuwenhuijsen, M., et al. (2021). Landscapes of becoming social: a systematic review of evidence for associations and pathways between interactions with nature and socioemotional development in children. *Environ. Int.* 146:106238. doi: 10.1016/j.envint.2020.106238

Organization for Economic Co-operation and Development (2017). *Social and emotional skills well-being, connectedness and success*. France: Organization for Economic Co-operation and Development.

Ponitz, C., McClelland, M., Matthews, J., and Morrison, F. (2009). A structured observation of behavioral self-regulation and its contribution to kindergarten outcomes. *Dev. Psychol.* 45, 605–619. doi: 10.1037/a0015365

Rao, Z., and Gibson, J. L. (2021). You pretend, I laugh: associations between dyadic pretend play and Children's display of positive emotions. *Front. Psychol.* 12, 1–8. doi: 10.3389/fpsyg.2021.669767

Richard, S., Gay, P., Clerc-Georgy, A., and Gentaz, E. (2019). Évaluation d'un entraînement base sur le jeu faire semblant destine à favoriser le développement des compétences socio-émotionnelles ches les enfants de cinq ans: étude exploratoire. *L'année Psychl.* 119, 291–332. doi: 10.3917/anpsy1.193.0291

Rieffe, C., Ketelaar, L., and Wiefferink, C. H. (2010). Assessing empathy in young children: construction and validation of an empathy questionnaire (EmQue). *Personal. Individ. Differ.* 49, 362–367. doi: 10.1016/j.paid.2010.03.046

Rieffe, C., and Wiefferink, C. H. (2017). Happy faces, sad faces; emotion understanding in toddlers and preschoolers with language impairments. *Res. Dev. Disabil.* 62, 40–49. doi: 10.1016/j.ridd.2016.12.018

Röhricht, F. (2009). Body oriented psychotherapy. The state of the art in empirical research and evidence-based practice: a clinical perspective. *Body Move. Dance Psychother.* 4, 135–156. doi: 10.1080/17432970902857263

Rosendahl, S., Sattel, H., and Lahmann, C. (2021). Effectiveness of body psychotherapy. A systematic review and Meta-analysis. *Front. Psych.* 12, 709–798. doi: 10.3389/fpsyt.2021.709798

Tandon, P. S., Saelens, B. E., Zhou, C., and Christakis, D. A. (2018). A comparison of preschoolers' physical activity indoors versus outdoors at child care. *Int. J. Environ. Res. Public Health* 15:2463. doi: 10.3390/ijerph15112463

Tillmann, S., Tobin, D., Avison, W., and Gilliland, J. (2018). Mental health benefits of interactions with nature in children and teenagers: a systematic review. *J. Epidemiol. Community Health* 72, 958–966. doi: 10.1136/jech-2018-210436

Veiga, G., Ketelaar, L., De Leng, W., Cachucho, R., Kok, J. N., Knobbe, A., et al. (2017). Alone at the playground. *Eur. J. Dev. Psychol.* 14, 44–61. doi: 10.1080/17405629.2016.1145111

Veiga, G., and Marmeleira, J. (2018). Regulação Emocional: Contributos das Técnicas de Relaxação. *Proceedings of the International Seminar: Multiple Approaches to the Study and Intervention in Stress*. (Évora, Portugal), 52–66.

Weissberg, R. P., Durlak, J. A., Domitrovich, C. E., and Gullotta, T. P. (2015). "Social and emotional learning: past, present, and future," in *Handbook of social and emotional learning: Research and practice*. eds. J. A. Durlak, C. E. Domitrovich, R. P. Weissberg and T. P. Gullotta. New York: The Guilford Press.

Wiefferink, C. H., Rieffe, C., Ketelaar, L., De Raeve, L., and Frijns, J. H. (2013). Emotion understanding in deaf children with a cochlear implant. *J. Deaf. Stud. Deaf. Educ.* 18, 175–186. doi: 10.1093/deafed/ens042

frontiers | Frontiers in Psychology

TYPE Original Research
PUBLISHED 03 August 2023
DOI 10.3389/fpsyg.2023.1195305

OPEN ACCESS

EDITED BY
Pedro Rosário,
University of Minho, Portugal

REVIEWED BY
Yixiao Liu,
Chongqing University, China
Linda Saraiva,
Polytechnic Institute of Viana do Castelo, Portugal

*CORRESPONDENCE
Guida Veiga
✉ gveiga@uevora.pt

RECEIVED 26 April 2023
ACCEPTED 24 July 2023
PUBLISHED 03 August 2023

CITATION
Veiga G, Guerreiro D, Marmeleira J, Santos GD and Pomar C (2023) OUT to IN: a body-oriented intervention program to promote preschoolers' self-regulation and relationship skills in the outdoors. *Front. Psychol.* 14:1195305. doi: 10.3389/fpsyg.2023.1195305

OUT to IN: a body-oriented intervention program to promote preschoolers' self-regulation and relationship skills in the outdoors

Guida Veiga[1,2]*, Daniela Guerreiro[1,2], José Marmeleira[1,2], Graça Duarte Santos[1,2] and Clarinda Pomar[3,4]

[1]Departamento de Desporto e Saúde, Escola de Saúde e Desenvolvimento Humano, Universidade de Évora, Évora, Portugal, [2]Comprehensive Health Research Centre (CHRC), Universidade de Évora, Évora, Portugal, [3]Departamento de Pedagogia e Educação, Escola de Ciências Sociais, Universidade de Évora, Évora, Portugal, [4]Centro de Investigação em Educação e Psicologia, Universidade de Évora, Évora, Portugal

Introduction: Time for movement and outdoor experiences has decreased in children's daily lives. Nevertheless, a growing body of research has shown that body-oriented interventions and outdoor time benefit preschoolers' social–emotional development, a foundation for mental health. OUT to IN is a body-oriented intervention program implemented outdoors, designed to promote preschoolers' social–emotional competence. This study aimed to evaluate the effects of OUT to IN on preschoolers' self-regulation and relationship skills.

Methods: A cluster randomized trial with multi-method and multi-informant assessment was implemented including 233 children between 3 and 6 years (122 boys, M_{age} = 5.07 years), from 4 preschools (8 groups with OUT to IN intervention, 4 groups without intervention – control group). The 153 children allocated to the OUT to IN group participated in biweekly sessions for 10 weeks. OUT to IN sessions followed a body-oriented approach comprising exercise play, relaxation, and symbolization activities, implemented outdoors by a psychomotor therapist and the preschool teacher. Sessions enabled children to feel, observe and control their bodily states and understand the relationship between their bodies and emotions. Teachers participated in a brief course and on 20 biweekly relaxation sessions. Children's self-regulation was measured through specific tasks and a parent questionnaire. Relationship skills (i.e., empathy, communication, cooperation and sociability) were measured through parents' and preschool teachers' questionnaires. Mann–Whitney test was used to study differences at baseline between the OUT to IN group and the control group, and to study differences in the 10-week changes between both groups. Wilcoxon Test was used for intragroup comparisons.

Results: After the 10-week intervention period, children who participated in OUT to IN showed significant improvements on self-regulation and relationship skills (empathy, cooperation and sociability), in comparison to the control group who did not show any significant improvements. Large size effects ($\eta^2 > 0.14$) were found for most of the variables related to self-regulation and small ($\eta^2 > 0.01$), medium ($\eta^2 > 0.06$) and large size effects ($\eta^2 > 0.14$) were found for the variables related to relationship skills.

Conclusion: OUT to IN showed to be an effective body-oriented intervention program in improving children's self-regulation and relationship skills, which are recognized foundations for mental health and well-being.

KEYWORDS

social–emotional competence, psychomotricity, physical play, relaxation, mind–body, early childhood education

1. Introduction

The early years are a prime time for social–emotional development. Throughout the preschool years, children improve their social–emotional competencies, such as empathizing with others' feelings, adapting behaviors, thoughts, and emotions, communicating their emotions and mental states, and cooperating and socializing with peers. Social–emotional competence has critical implications for children's adjustment and success (Shonkoff and Phillips, 2000), such that it is widely recognized as a central goal of preschool education and a target of several intervention programs.

Although most intervention programs have been implemented indoors, the potential of outdoor learning dates to Aristotle and Plato. Indeed, the importance of the outdoors for children's development is highlighted by the term kindergarten (or garden of children) and is central to the educational theories of recognized pedagogues such as Rousseau, Froebel, or Pestalozzi (Allen, 2017). The outdoors is a highly stimulating setting where emotions can run high, and children feel freer to move, experiment and modulate the environment and their behavior (Veiga et al., 2020). A recent systematic review showed that natural environments facilitate children's positive relationships and socially adaptive behaviors (Mygind et al., 2021). Moreover, contact with natural elements has been established to have a calming effect, reducing stress and improving mental health (Tillmann et al., 2018). Specifically, concerning outdoor-friendly early childhood environments, the systematic review of Johnstone et al. (2022) showed the benefits for children's social–emotional competence, particularly self-regulation and relationship skills.

With so few years under their belts, preschoolers are still learning to inhabit their bodies. Actually, it is by engaging their bodies in doing, moving, acting, and interacting that children acquire knowledge and master their competencies. Indeed, play, dance, relaxation, and other body-oriented approaches have been increasingly implemented in early childhood education and are known to effectively promote preschoolers' social–emotional competence (Dias Rodrigues et al., 2022a,b). Body-oriented interventions are supported by the intrinsic relationship between motion and emotion, integrating both sides in a balance of sensing and moving. As bodily sensations, bodily postures, gestures, and expressions are inherent components of the emotional experience, accessing such somatic information is critical to one's identity and social–emotional development (Fuchs and Koch, 2014). Nonetheless, a recent systematic review (Dias Rodrigues et al., 2022b) focused on the effects of body-oriented interventions implemented in early-childhood education settings, showed inconsistent findings regarding the benefits of these interventions on self-regulation. Such inconsistency was related to differences in the dosage of the interventions, suggesting that a higher frequency is needed to improve self-regulation. Concerning relationship skills, there is moderate evidence for the improvements of body-oriented interventions on preschoolers' empathy and social interaction, and limited evidence regarding the improvements in social cooperation (Dias Rodrigues et al., 2022b).

The most used body-oriented approach to improve preschoolers' social–emotional competence is play (Dias Rodrigues et al., 2022a,b). Regarding play-based interventions, research reveals moderate evidence for improvements in empathy and social interaction, limited evidence for increased social cooperation and contradictory evidence for self-regulation (Dias Rodrigues et al., 2022a). It has been speculated that the type of play facilitated by the intervention might have a critical role and that physical play (particularly, exercise play) might be particularly beneficial concerning self-regulation (Dias Rodrigues et al., 2022a). Indeed, physical play has been argued to give preschoolers an important opportunity to feel their own bodily states, which are a central part of the emotional experience. Such opportunity is crucial for children to become aware of the relationship between their own bodily states and emotions, therefore promoting self-awareness and regulation (Veiga et al., 2022). Moreover, research has shown that exercise play, mainly when engaged with peers, is related to emotion understanding, emotion regulation and social competence (Lindsey and Colwell, 2013; Veiga et al., 2017).

Interventions based on relaxation have been also implemented in preschools. Contrary to play interventions, relaxation involves a more pronounced interoceptive approach, with a specific focus on body awareness and regulation which paves the way to self-awareness and regulation (Veiga, 2022). Despite the recent popularity of mindfulness (Flook et al., 2015), other approaches have also been implemented in preschools, such as breathing exercises or progressive muscle relaxation (Murray et al., 2018). However, studies focused on this type of body-oriented intervention are still scarce and with low methodological quality (Dias Rodrigues et al., 2022a). Although a recent systematic review showed moderate evidence that relaxation intervention does not improve self-regulation, the authors hypothesized that such lack of positive outcomes could be related to the short duration of the sessions (11–25 min) (Dias Rodrigues et al., 2022a). No studies have yet examined the effects of relaxation on preschoolers' relationship skills.

Body-oriented interventions combining play and relaxation are scarce. To the best of our knowledge only one study has combined both approaches, however the intervention involved an externally-oriented type of play (i.e., loose parts play) and a relaxation moment, which was implemented indoors. Besides, the intervention had a short duration (5-day), and the effects on self-regulation and relationship skills were not examined (Lee et al., 2020).

Acknowledging the important role of exercise play and relaxation for social–emotional development, OUT to IN, a body-oriented intervention program, combining both approaches was designed to improve preschoolers' social–emotional competence. OUT to IN is based on embodiment theory (e.g., Fuchs and Koch, 2014), aiming to help preschoolers enter a sensing, reflective and affective mode. Hence, bodily activities, i.e., exercise play and relaxation, are structured and facilitated in order to give children opportunities to integrate bodily (interoceptive and proprioceptive) feedback, to reflect

on it, and express these corporeal experiences, verbally and non-verbally. Between activities, children are asked to sense their own body, and become aware of their bodily states (e.g., heart rate, temperature, muscle tone, breathing). Considering the above-mentioned potential of the outdoors for social–emotional well-being, the program was designed to be implemented outdoors.

The main purpose of this study was to examine the effects of OUT to IN on preschoolers' self-regulation and relationship skills. More specifically, it was hypothesized that self-regulation, empathy, cooperation, sociability, and communication would benefit from a 10-week (20 sessions) body-oriented intervention which combines exercise play, relaxation, and symbolization activities.

2. Methods

2.1. Ethics statement

The study was approved by the research ethics board at the University of Évora (#20088), Portugal, and was carried out under the standards set by the Declaration of Helsinki (General Assembly of the World Medical Association, 2014). Written informed consent was provided by preschool teachers and parents for their participating children. Children gave their verbal consent. The collected data was fully encrypted to ensure the privacy of the participants.

2.2. Procedures

The directors of four preschool Portuguese institutions were asked for permission to conduct the current study at their school. After preschool teachers' consent regarding their willingness to participate in the study, they presented the project to the parents and handed out the consent forms and the questionnaires. After parents gave their written consent, testing sessions with children were scheduled.

2.3. Study design

The study was registered at clinicaltrials.gov (#200088). A randomized trial with multi-method (tasks and questionnaires) and multi-informant (children, preschool teachers, parents) assessment was implemented to evaluate the effects of OUT to IN on preschoolers' social–emotional competencies. The study was implemented in 4 Portuguese preschools in the second and third trimester (January–June) of 2020/2021 and 2021/22 preschool year, nested within 12 groups. The inclusion criteria were: (a) age between 3 and 6 years, (b) not have participated in a similar intervention program within the last 6 months, and (c) not have a condition that can affect the participation in the study.

Eight groups were randomly allocated to the intervention and 4 groups to the control group. Each preschool had, at least, an intervention group and a control group. Children allocated to the intervention group participated in biweekly sessions for 10 weeks (total = 20 sessions) and children were allocated to the control groups maintained their usual routine. After the end of the study, children from the control group participated in OUT to IN sessions.

2.4. Participants

From a total of 257 families approached to participate in the study, only nine children did not meet the inclusion criteria (i.e., children with special needs, $n = 7$; refugee children who did not speak Portuguese, $n = 2$). Although these children participated in the intervention, they were not included for statistical analysis. As represented in Figure 1, two children dropped out school throughout the intervention period and 15 families did not accept to participate in the study, representing an acceptance rate of 92.2%. Regarding the remaining 233 children (122 boys; $M_{age} = 5.07$ years), the majority were Portuguese ($n = 227$). The nationality of the other children was other European ($n = 1$), Asiatic ($n = 2$), and South American ($n = 3$). The predominant level of maternal education was higher education (40.3%), the predominant level of paternal education was secondary education (44.6%), most children had brothers or sisters (74.5%) and lived in an urban area (79.7%).

Children were randomly allocated to the OUT to IN Group ($n = 155$; 8 groups with intervention) and to the Control Group ($n = 78$; 4 groups without intervention – control group). As represented in Table 1 no significant differences were found between groups, regarding age, gender, and sociodemographic measures. Also, as shown in Table 2 no differences were found between groups in terms of their self-regulation and relationship skills.

2.5. Procedures and materials

Children were tested individually in a quiet room of the school. Testing sessions took approximately 25 minutes and were video recorded. Children's self-regulation was measured individually through specific tasks that are presented as games and a parent questionnaire. Relationship skills (i.e., empathy, cooperation, sociability and communication) were measured through parents' and preschool teachers' questionnaires. Due to sickness or holidays, some children failed the testing sessions. Also, some parents did not retrieve the questionnaires. As Little's MCAR test ($p > 0.05$) indicated these missing values were random, all participants were included and listwise deletion was used for the cases with missing values.

2.5.1. Self-regulation

Self-regulation was measured through the Day and Night task (DN; Gerstadt et al., 1994), the Head Toes Knees and Shoulders task (HTKS; McClelland et al., 2014) and the composite scale Externalizing Behaviors from the Strengths and Difficulties Questionnaire (SDQ; Goodman, 1997).

The DN is a simplified version of the Stroop test (Stroop, 1935) for younger children. It is a task that requires inhibitory control, involving the ability to inhibit a natural tendency to give a verbal response in accordance with the visual stimulus, but instead give a verbal response which is opposite to the visual command. Specifically, whenever the child sees a black card, with a moon and stars, he/she must say "day," whenever the child sees a white card, with a brightly sun, must say "night." The number of "day" and "night" cards is equal, and the cards are presented in an aleatory order. One point is assigned to each correct answer, totaling a maximum of 16 points. A higher classification reflects a better inhibitory control.

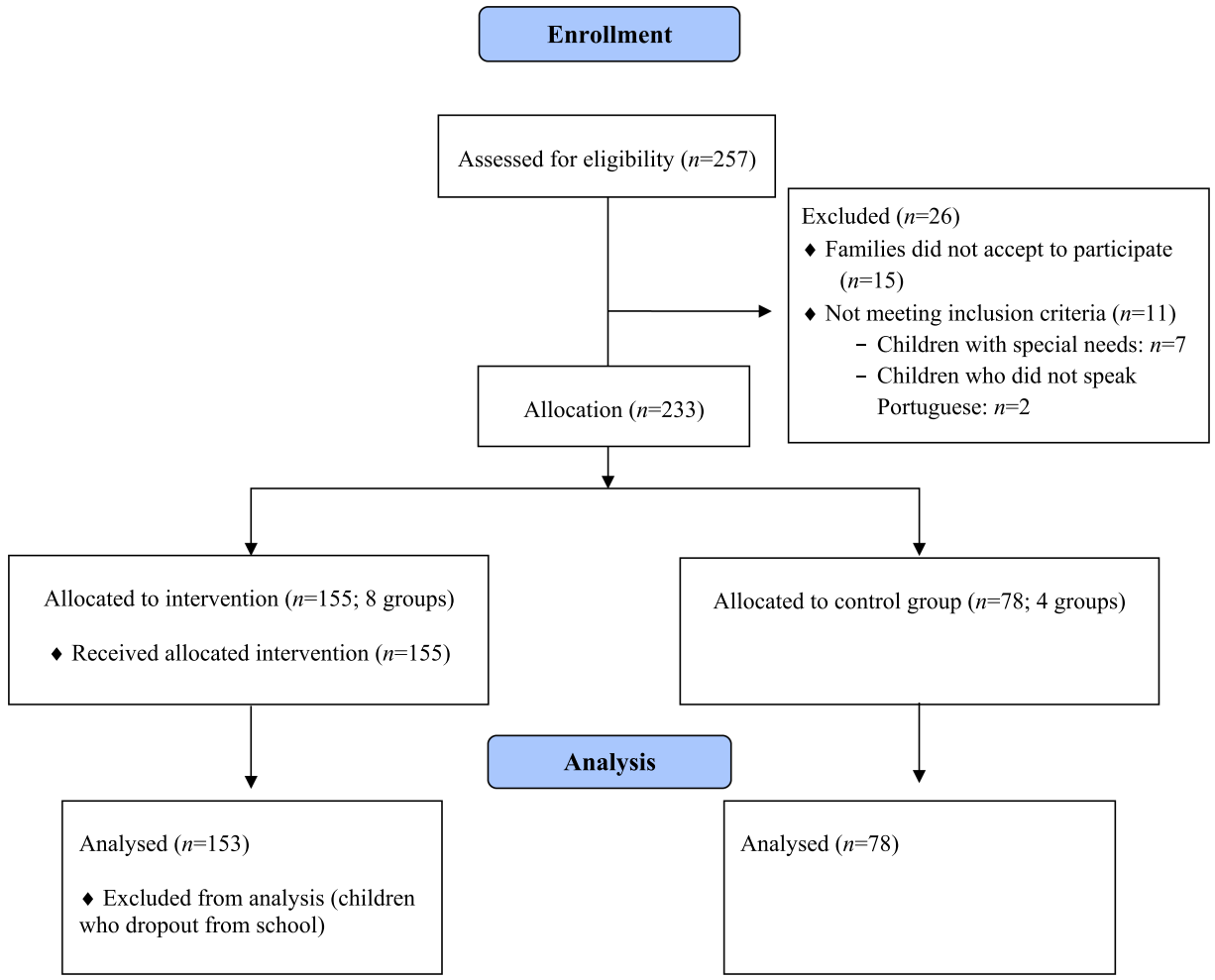


FIGURE 1
Flow diagram of recruitment and participation.

The HTKS task (McClelland et al., 2014) involves inhibitory control, working memory, and attention. The performance of the HTKS task requires the ability to inhibit the natural tendency to give a motor response in accordance with the verbal command, and to perform a motor response, which is opposite to the verbal command. For example, when the child is asked to touch the feet, he/she must touch the head and vice versa, when the child is asked to touch the shoulders, he/she must touch the knees and vice versa. The task involves three parts, each with 10 commands (feet/head; shoulders/knees; feet/head/shoulders/knees). Two points are assigned to each command correctly performed and one is assigned when the child can self-correct the performance, totaling a maximum of 60 points. A higher classification reflects a better inhibitory control.

Externalizing behaviors were obtained through a composite scale which comprises two scales of the Strengths and Difficulties Questionnaire (Goodman, 1997; Cronbach' s alpha = 0.75): behavior problems (5 items; e.g., "Often has temper tantrums or hot tempers"; "Often fights with other children or bullies them") and hyperactivity (5 items; e.g., Restless, overactive, cannot stay still for long; Constantly fidgeting or squirming). Parents were asked to rate their children's behavior in a 3-point Likert scale, from 1 (not true) to 3 (certainly true). An average score of the 10 items is obtained and higher scores indicate poorer self-regulation.

2.5.2. Relationship skills

The Empathy, Cooperation and Sociability were measured through the parents' and preschool teachers' Study on Social and Emotional Skills Questionnaire (SSES; Kankaraš and Suarez-Alvarez, 2019), a parent and preschool teacher report questionnaire. Parents and preschool teachers were asked to fill in the Empathy (e.g., "He/she can feel how others are feeling"; "He/she understands what others want"; Cronbach' s alpha = 0.81, 0.85), Cooperation (e.g., He/she works well with others; he/she likes to help others; Cronbach' s alpha = 0.62, 0.62), and Sociability subscales (e.g., He/she has many friends; He/she makes friends easily; Cronbach' s alpha = 0.72, 0.49) in a 5-point Likert scale from one (completely disagree) to five (completely agree). Each scale is obtained by the average of the respective items. Higher scores indicate better relationship skills.

Emotion communication was obtained through the Emotion Vocabulary Questionnaire (EVQ; Ketelaar et al., 2015), a parent-report which assesses whether children know and use emotion and/or mental state words, in a 2-point Likert scale from 1 (no) to 2 (yes). The EVQ includes either basis emotions (e.g., happy, angry), complex

emotions (e.g., jealous, disappointed), and mental state words (e.g., thinking, dreaming). A mean score across the items is calculated to indicate children's emotion communication (Cronbach' s alpha = 0.72).

2.5.3. The OUT to IN program

OUT to IN comprises 20 body-oriented biweekly 40-min sessions facilitated by a psychomotor therapist in a pedagogical partnership with the preschool teacher. Sessions are implemented outdoors. All sessions are framed in a context of freedom, and self and mutual bodily resonance, according to the following structure: First, children are invited to engage in exercise play activities such as running, jumping, rolling, which are presented in a semi-directed approach, seeking to promote the sensing, exploration, and awareness of different bodily, rhythmic, and expressive movements. Second, children engage in ludic relaxation proposals such as stretching, observing, and controlling their own breathing, changing the levels of tension in different body segments, active-passive movements, etc., which help children to focus their attention on their body, sensing it and progressively learning to control it. Finally, children are asked to reflect on their bodily experiences and express themselves through different expressive mediators such as voice, movement, painting, or modeling. The program involves 4 subsequent stages (5 sessions each): The first stage, "I feel and observe," aims to develop body- and self-awareness. The second stage, "I discover my body potential," aims to promote motor competence and self-regulation. The third stage, "I imagine in my body," aims to stimulate self-regulation and emotion communication. Finally, the fourth stage, "I communicate in relationship," focuses on relationship skills.

Along with the intervention with children, preschool teachers engage in a 25-hour training focused on the underlying principles of OUT to IN: namely, the importance of socio-emotional competencies for health, well-being and learning, the educational and developmental value of the outdoors, the potentialities of body-oriented approaches for preschoolers' development and learning, among others. Moreover, preschool teachers also participate in 20 body-oriented biweekly 20-min sessions. Sessions involve relaxation activities, and are structured in 4 moments: activation, body awareness, body self-regulation and symbolization. Sessions are facilitated by a psychomotor therapist, with a bachelor and a master in Psychomotricity, and expertise in bodily expression and movement. The psychomotor therapist has weekly supervision with a second therapist from the research team that developed OUT to IN, with experience in psychomotor practice and supervision.

TABLE 1 Demographic characteristics of participants.

	Participants	OUT to IN group	Control group
	(*n* = 233)	(*n* = 153)	(*n* = 78)
Years of age (*M*, SD)	5.07 (0.84)	5.07 (0.82)	5.08 (0.87)
Years of age (range)	3.19–6.30	3.19–6.30	3.19–6.30
Boys (*n*)	122	80	42
Girls (*n*)	111	73	36
Maternal education (%)			
Basic education	11.7	12.6	9.9
Secondary education	36.4	34.8	39.4
Higher education	40.3	40.0	40.8
Master or Doctoral degree	11.7	12.6	9.9
Paternal education (%)			
Basic education	27.0	27.6	25.7
Secondary education	44.6	44.8	44.3
Higher education	21.6	21.6	21.4
Master or Doctoral degree	6.9	6.0	8.6

2.6. Data analysis

A descriptive analysis of sociodemographic and outcome variables was performed. As the Kolmogorov–Smirnov test evidenced that most variables did not have a normal distribution, intervention effects were

TABLE 2 Scores (baseline- and post- intervention), changes of scores, and effect sizes on self-regulation.

	Baseline (*M*, SD)		Post-intervention (10 weeks) (*M*, SD)		Difference between means, *M* (%95 CI)		Value of *p*
	OUT to IN group	Control group	OUT to IN group	Control group	OUT to IN group	Control group	
Children							
DN Task	0.61 (0.37)	0.57 (0.37)	0.91 (0.14)***	0.61 (0.34)	0.30 (−0.12; 1.00)	0.03 (−28.00, 29.00)	<0.001
HTKS Task	12.71 (16.64)	11.51 (15.71)	33.75 (16.98)***	13.07 (16.21)	21.02 (−16.00, 60.00)	1.55 (−28.00, 29.00)	<0.001
Parents							
Externalizing behaviors	1.62 (0.33)	1.65 (0.34)	1.56 (0.33)	1.61 (0.31)	−0.07 (−0.70, 1.30)	−0.04 (−1.00, 0.30)	0.120

[a]Inter-group comparisons at baseline through Mann–Whitney Test. *Intra-group comparisons through Wilcoxon Test (*$p < 0.05$; **$p < 0.01$; ***$p < 0.001$). p for 10- week changes between both groups through Mann–Whitney Test.

examined through non-parametric statistics. Wilcoxon Test was used for intragroup comparisons between baseline and post-intervention. Mann–Whitney test was used to compare the results between the OUT to IN Group and the Control Group at the baseline, and the score changes from baseline to post-intervention between the two groups. Effect sizes were calculated following the guidelines of Fritz et al. (2012) for non-parametric statistics (Mann–Whitney test) and were reported as eta-squared (η^2), with cut-off values of 0.01, 0.06, and 0.14 for small, medium, and large effects, respectively (Cohen, 1988). The delta value (Δ%) of proportional change between each moment (baseline, post-intervention) was calculated using the formula: Δ% = [(post-intervention – baseline)/baseline] x 100. Statistical analyses were carried out using IBM SPSS Version 27 (IBM Corp, 2017). For all statistical tests, significance was set at p value < 0.05. The results are expressed as mean and standard deviation, or mean and 95% Confidence Interval.

3. Results

As shown in Tables 2, 3, there were no statistical differences between groups at baseline, except for empathy as rated by preschool teachers, which was higher for the CG compared to the OUT to IN Group ($U = 4407.5$; $p = 0{,}045$).

Several within- and between-group differences were found for self-regulation (Table 2). Significant improvements were observed after the 10-week intervention for the OUT to IN Group in Day and Night scores (49.4%, $p < 0.001$) and HTKS scores (165%, $p < 0.001$). No significant pre-post differences were found for the CG. Mann–Whitney test analysis on change scores showed significant pre-post differences between groups in the Day and Night task ($U = 3014.5$; $p < 0.001$) and the HTKS task ($U = 1{,}663$; $p < 0.001$), yielding a positive impact of the intervention. Large effect sizes were found for Day and Night ($\eta^2 = 0.142$) and HTKS ($\eta^2 = 0.331$).

Table 3 shows the results on relationship skills. Regarding within-group results, after 10 weeks children from the OUT to IN Group had higher scores on empathy (2.75%; $p = 0.008$), cooperation (2.13%, $p = 0.019$), and sociability (3.22%, $p = 0.008$), rated by parents, and on empathy (5.75%, $p < 0.001$) cooperation (2.89%, $p = 0.003$), and sociability (5.35%, $p < 0.001$), rated by teachers and had lower scores on emotion communication, as rated by parents (−5.36%, $p = 0.002$) Moreover, after the 10-week intervention period, children from the CG had lower scores on emotion communication, as rated by parents (−5.24%, $p = 0.007$), and on empathy (−6.38%, $p < 0.001$), as rated by preschool teachers.

Mann–Whitney test analysis on change scores showed significant pre-post differences between groups in empathy ($U = 2{,}624$; $p < 0.001$), cooperation ($U = 4{,}028$; $p = 0.004$), and sociability ($U = 3478.5$; $p < 0.001$) as assessed by the preschool teachers. A small effect size ($\eta^2 = 0.012$) was found for empathy as rated by parents. Regarding preschool teachers' assessments, small, medium and large effect sizes were found for cooperation ($\eta^2 = 0.036$), sociability ($\eta^2 = 0.078$), and empathy ($\eta^2 = 0.172$), respectively.

4. Discussion

Body-oriented interventions and outdoor time seem to benefit preschoolers' social–emotional development, a foundation for mental health. We investigated the effectiveness of OUT to IN, a body-oriented intervention program for preschoolers, combining physical play and relaxation activities, that was implemented in the kindergarten outdoors. The findings of the present study suggest that OUT to IN, effectively promotes preschoolers' social–emotional competence. In particular, OUT to IN showed to increase self-regulation, empathy, cooperation, and sociability. The mostly large effect sizes of these increases suggest the effectiveness of OUT to IN in enhancing preschool children's self-regulation and relationship skills. To the best of our knowledge, this is the first study to examine the effects of a body-oriented program implemented outdoors on preschoolers' social–emotional competence.

OUT to IN sessions combined a sequence of exercise play and playful relaxation. Both play and relaxation, give children opportunities to feel and become aware of their bodies, either in

TABLE 3 Scores (baseline and post- intervention), changes of scores, and effect sizes on relationship skills.

	Baseline (*M*, SD)		Post-intervention (10 weeks) (*M*, SD)		Difference between means *M* (%95 CI)		Value of *p*
	OUT to IN group	Control group	OUT to IN group	Control group	OUT to IN group	Control group	
Parents							
Empathy	3.91 (0.47)	3.86 (0.46)	4.02 (0.48)**	3.92 (0.40)	0.11 (−0.1.00, 1.13)	0.06 (−0.50, 1.63)	0.151
Cooperation	3.83 (0.40)	3.73 (0.46)	3.91 (0.39)*	3.83 (0.32)	0.08 (−0.50, 1.00)	−0.10 (−0.75, 2.00)	0.866
Sociability	3.71 (0.51)	3.74 (0.47)	3.83 (0.43)**	3.79 (0.47)	0.12 (−0.75, 1.38)	0.04 (−1.75, 1.50)	0.297
Communication	1.46 (0.25)	1.44 (0.21)	1.38 (0.25)**	1.36 (0.23)*	−0.08 (−0.85, 0.60)	−0.08 (−0.60, 0.45)	0.784
Preschool Teachers							
Empathy	3.94 (0.58)[a]	4.09 (0.63)	4.16 (0.60)***	3.82 (0.72)***	0.23 (−0.67, 1.67)	−0.26 (2.33, 1.00)	<0.001
Cooperation	3.89 (0.69)	3.86 (0.84)	4.00 (0.74)**	3.82 (0.69)	0.11 (−1.33, 1.67)	−0.03 (−1.00, 2.67)	0.004
Sociability	4.12 (0.54)	4.07 (0.53)	4.34 (0.52)***	3.98 (0.57)	0.22 (−0.12, 1.00)	−0.10 (−2.33, 1.00),	<0.001

[a]Between-group comparisons at baseline through Mann–Whitney Test. *Within-group comparisons through Wilcoxon Test (*$p < 0.05$; **$p < 0.01$; ***$p < 0.001$). p for 10- week changes between both groups through Mann–Whitney Test.

movement or stillness (Veiga et al., 2022). Several theories have emphasized the critical role of perceiving bodily states (e.g., Damasio, 1994; Barsalou et al., 2007; Niedenthal, 2007; Fuchs and Koch, 2014) for social–emotional development. Indeed, such bodily awareness is an important component of the emotional experience and seems to facilitate self-regulation (Barrett et al., 2001; Füstös et al., 2013). Besides, both body-oriented approaches (i.e., play and relaxation) involve controlling bodies and mind, particularly by suppressing or countermanding movement and thoughts, therefore stimulating self-regulation. It is important to note that previous studies (Flook et al., 2015; Murray et al., 2018) that implemented relaxation intervention in early-childhood education settings did not show improvements in preschoolers' self-regulation. However, these studies used sedentary/passive relaxation methods, such as progressive muscle relaxation (Murray et al., 2018) or mindfulness (Flook et al., 2015). Considering that children at such a young age should not be sedentary for extended periods (World Health Organization, 2019) and prefer intermittent type (passive/active) activity (Timmons et al., 2007), such inconsistent findings previously reported (Dias Rodrigues et al., 2022a) might suggest the importance of using physically active approaches, such as exercise play, and active relaxation when aiming to facilitate preschoolers' self-regulation. Besides, the outdoor environment is also known as a facilitator of physical activity and self-regulation (Tillmann et al., 2018; Johnstone et al., 2022). In fact, the other known study that implemented a combined play-relaxation program (Lee et al., 2020) used more sedentary forms of play (i.e., loose parts play) and relaxation (i.e., mindfulness), that was experienced indoors.

It is important to note that, in line with other previous studies (Solomon et al., 2018; Richard et al., 2019) that also used play to improve preschoolers' social–emotional competence, OUT to IN did not effectively decrease externalizing behaviors. While those other studies (Solomon et al., 2018; Richard et al., 2019) used role play, OUT to IN used exercise play. This more active form of play had been hypothesized by a previous systematic review (Dias Rodrigues et al., 2022a) to be important to help children learn to regulate their impulses. However, our findings did not confirm this hypothesis. Possibly, only an intervention based on rough-and-tumble play, which involves physical contact with peers, sharing the winning and losing, and more intense arousal, can help preschoolers learn to regulate their behavior. Although previous studies with older children (Carraro et al., 2014; Carraro and Gobbi, 2018) point in this direction, no study has yet examined the effects of an intervention based on rough-and-tumble play on preschoolers' externalizing behaviors.

Nonetheless, our findings show that OUT to IN effectively improves relationship skills, such as empathy, cooperation, and sociability, which is in line with a previous systematic review that showed moderate evidence for the positive effects of play-based interventions on empathy and social interactions (Dias Rodrigues et al., 2022a). According to the authors, over and above the type of play, the social level of the intervention is the most critical component for the improvement of relationship skills. In fact, it should be emphasized that OUT to IN sessions, are carried out with the whole group of children, and involve a progression in terms of the frequency and complexity of social interactions. While the first sessions are focused on the child's self-awareness, throughout the program there is a progressive approach to the others, implicating the empathic observation and response to the other, cooperation and problem solving.

Concerning relationship skills rated by preschool teachers, it is also important to note that while children who participated in the OUT to IN intervention increased their competencies after the 10-week period, children in the inactive control group decreased their competencies. These findings denote the importance of an intervention program for setting children on a positive trajectory for ongoing development. OUT to IN seems to protect preschoolers, uplifting them in their social relationships, which are known to be critical for their health and well-being (Goswami, 2012). The non-significant changes in relationship skills rated by parents might be related to the fact that parents do not have as many opportunities to observe their children in social contexts as preschool teachers do, limiting their appreciation of relationship skills and their sensitivity to changes in this domain (Huber et al., 2019).

Finally, our findings show that parents reported a decrease in emotion communication. Every OUT to IN session ended with a moment of symbolization when children were invited and guided to reflect on the sensations felt during exercise play and relaxation activities. Despite this specific moment to elaborate and express themselves through expressive mediators (e.g., paint, dance) such non-verbal approach might not have been enough to improve emotion communication. Moreover, although the outdoor context particularly favors body expressiveness, it poses some constraints (e.g., acoustic, intimacy) to emotional communication. The improvement of emotion communication would possibly require a calmer moment (indoors) after the session, where children could give words to their gestures, poses, and expressions.

The role of preschool teachers on the success of the program should also be acknowledged. As other studies showed (Reder et al., 2000; Justo, 2008), adults' social–emotional competencies are critical for children's social–emotional development. Indeed, before the beginning of the intervention, preschool teachers participated in a 25-hour training that increased their knowledge and competence regarding preschoolers' social–emotional competence and the role of body-oriented approaches and outdoor time for social–emotional well-being. Besides, preschool teachers engaged in relaxation sessions, during the same period of children's intervention. Such empowerment of preschool teachers' knowledge and competence on the social–emotional domain, might have been important for the success of the intervention with children. Future studies would benefit from a planned examination of which specific components (children's intervention, preschool teachers' intervention, or combined interventions) of the program contribute to children's outcomes. Moreover, future studies should also add a parent component to the intervention, as recent research indicates a stronger impact of children intervention when combined with parents' intervention (Neville et al., 2013).

4.1. Implications for practice

This study's findings reinforce the outdoors' potential for preschoolers' social–emotional competence. Indeed, the outdoors should deserve the same attention as the indoors, and more opportunities should be created for feeling, moving, and expressing own body outside, either by parents, preschool teachers, local communities, and policymakers.

The positive effects of OUT to IN on social–emotional competence also highlight the importance of giving preschool-aged

children opportunities to experience and integrate bodily (interoceptive and proprioceptive) sensations, reflect on them, and express these corporeal experiences, verbally and non-verbally. Body-oriented approaches, such as physical play, relaxation, and dance, are a rich context for stimulating such somatic repertoire. Policymakers should acknowledge that emotions are embodied by nature, and social–emotional learning is much improved when children get the chance to identify the bodily sense of their own emotional experience. Henceforth such body-oriented practices should integrate the early-childhood education curriculum and be valued within the interaction between teachers and families. Indeed, teachers should clarify the families about the importance of these practices (e.g., physical play, relaxation, dance), especially outdoors, and support families to offer their children more bodily experiences outdoors.

Finally, one should remember that children learn to become aware and regulate their emotions, mainly by modeling, observing, and talking about emotions with knowledgeable others, such as their teachers. That is, self-aware and self-regulated teachers are critical for self-aware and self-regulated children. However, teachers face stressful conditions daily, feeling discouraged and burnt out. Considering that "teachers are the most important school-related factor impacting student learning" (OECD, 2020, p. 41), the findings of this study encourage early childhood education policymakers to provide teachers with relaxation-based intervention programs in order to develop their social–emotional competence. The development of these competencies should be focused either in pre-service education, in continuous education. These moments, where teachers can have the opportunity to feel and regulate their bodies and emotions, can help them recognize their everyday life emotions and proactively regulate how they behave and interact with children, contributing to children's social–emotional learning.

5. Conclusions and limitations

OUT to IN showed to be an effective body-oriented intervention program in improving children's self-regulation and relationship skills, which are recognized foundations for mental health and well-being. Nonetheless, it is important to note that this study has some limitations, such a lack of an active control group. Moreover, although the OUT to IN group and the control group were similar at most baseline measures, and group allocation was randomized, children were nested within classrooms. Thus, future research could use randomized control trials with random assignment at the individual participant level. Also, future studies should combine questionnaires with observational methods in order to have a more ecological assessment of social-relationship skills. Finally, further studies must include a post-intervention follow-up in their design to evaluate the long-term effectiveness of the OUT to IN intervention in self-regulation and relationship skills.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Ethics statement

The studies involving humans were approved by University of Évora Ethics Committee. The studies were conducted in accordance with the local legislation and institutional requirements. Written informed consent for participation in this study was provided by the participants' legal guardians/next of kin.

Author contributions

GV and JM contributed to the design and conception of this study. GV, DG, and GDS cautiously designed the intervention program. GV and CP supervised the implementation of the study. DG collected data, which was analyzed by GV, DG, and JM. GV wrote the first draft of the manuscript. All authors contributed to manuscript revision, read, and approved the submitted version.

Funding

This work was co-financed by the Calouste Gulbenkian Foundation's Knowledge Academies program and by the University of Évora.

Acknowledgments

The authors thank all the schools, preschool teachers, parents, and children who took part in this study.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Publisher's note

References

Allen, A. T. (2017). *The transatlantic kindergarten: education and women's movements in Germany and the United States*. Oxford: Oxford University Press.

Barrett, L. F., Gross, J., Christensen, T. C., and Benvenuto, M. (2001). Knowing what you're feeling and knowing what to do about it: mapping the relation between emotion

differentiation and emotion regulation. *Cognit. Emot.* 15, 713–724. doi: 10.1080/02699930143000239

Barsalou, L. W., Breazeal, C., and Smith, L. B. (2007). Cognition as coordinated non-cognition. *Cogn. Process.* 8, 79–91. doi: 10.1007/s10339-007-0163-1

Carraro, A., and Gobbi, E. (2018). Play fighting to cope with children aggression: A study in primary school. *J. Phys. Educ. Sport* 2018:3215. doi: 10.7752/jpes.2018.03215

Carraro, A., Gobbi, E., and Moè, A. (2014). Brief report: play fighting to curb self-reported aggression in young adolescents. *J. Adolesc.* 37, 1303–1307. doi: 10.1016/j.adolescence.2014.09.009

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences. 2nd Edn* Hillsdale: Lawrence Erlbaum.

Damasio, A. R. (1994). *Descartes' Error*. New York, NY: Random House.

Dias Rodrigues, A., Cruz-Ferreira, A., Marmeleira, J., Laranjo, L., and Veiga, G. (2022a). Which types of body-oriented interventions promote preschoolers' social-emotional competence? A systematic review. *Healthcare* 10:2413. doi: 10.3390/healthcare10122413

Dias Rodrigues, A., Cruz-Ferreira, A., Marmeleira, J., and Veiga, G. (2022b). Effects of body-oriented interventions on preschoolers' social-emotional competence: A systematic review. *Front. Psychol.* 12. doi: 10.3389/fpsyg.2021.752930

Flook, L., Goldberg, S. B., Pinger, L., and Davidson, R. J. (2015). Promoting prosocial behavior and self-regulatory skills in preschool children through a mindfulness-based kindness curriculum. *Dev. Psychol.* 51, 44–51. doi: 10.1037/a0038256

Fritz, C. O., Morris, P. E., and Richler, J. J. (2012). Effect size estimates: current use, calculations, and interpretation. *J. Exp. Psychol. Gen.* 141, 2–18. doi: 10.1037/a0024338

Fuchs, T., and Koch, S. C. (2014). Embodied affectivity: on moving and being moved. *Front. Psychol.* 5:508. doi: 10.3389/fpsyg.2014.00508

Füstös, J., Gramann, K., Herbert, B. M., and Pollatos, O. (2013). On the embodiment of emotion regulation: interoceptive awareness facilitates reappraisal. *Soc. Cogn. Affect. Neurosci.* 8, 911–917. doi: 10.1093/scan/nss089

General Assembly of the World Medical Association (2014). World medical association declaration of Helsinki: ethical principles for medical research involving human subjects. *J. Am. Coll. Dent.* 81, 14–18. doi: 10.1001/jama.2013.281053

Gerstadt, C. L., Hong, Y. J., and Diamond, A. (1994). The relationship between cognition and action: performance of children 312–7 years old on a stroop- like day-night test. *Cognition* 53, 129–153. doi: 10.1016/0010-0277(94)90068-x

Goodman, R. (1997). The strengths and difficulties questionnaire: A research note. *J. Child Psychol. Psychiatry* 38, 581–586. doi: 10.1111/j.1469-7610.1997.tb01545.x

Goswami, H. (2012). Social relationships and children's subjective well-being. *Soc. Indic. Res.* 107, 575–588. doi: 10.1007/s11205-011-9864-z

Huber, L., Plötner, M., In-Albon, T., Stadelmann, S., and Schmitz, J. (2019). The perspective matters: A multi-informant study on the relationship between social–emotional competence and preschoolers' externalizing and internalizing symptoms. *Child Psychiatry Hum. Dev.* 50, 1021–1036. doi: 10.1007/s10578-019-00902-8

IBM Corp. (2017). *IBM SPSS statistics for windows, version 24.0*. Armonk, NY: Author

Johnstone, A., Martin, A., Cordovil, R., Fjørtoft, I., Iivonen, S., Jidovtseff, B., et al. (2022). Nature-based early childhood education and children's social, emotional and cognitive development: A mixed-methods systematic review. *Int. J. Environ. Res. Public Health* 19:5967. doi: 10.3390/ijerph19105967

Justo, C. F. (2008). Programa de relajación y de mejora de autoestima en docentes de educación infantil y su relación con la creatividad de sus alumnos. *Revista Iberoamericana de Educación* 45, 1–11. doi: 10.35362/rie4512169

Kankaraš, M., and Suarez-Alvarez, J. (2019). *Assessment framework of the OECD study on social and emotional skills. OECD education working papers, No. 207*. OECD Publishing: Paris.

Ketelaar, L., Wiefferink, C. H., Frijns, J. H., Broekhof, E., and Rieffe, C. (2015). Preliminary findings on associations between moral emotions and social behavior in young children with normal hearing and with cochlear implants. *Eur. Child Adolesc. Psychiatry* 24, 1369–1380. doi: 10.1007/s00787-015-0688-2

Lee, R., Lane, S., Tang, A., Leung, C., Kwok, S., Louie, L., et al. (2020). Effects of an unstructured free play and mindfulness intervention on wellbeing in kindergarten students. *Int. J. Environ. Res. Public Health* 17:5382. doi: 10.3390/ijerph17155382

Lindsey, E. W., and Colwell, M. J. (2013). Pretend and physical play: links to preschoolers' affective social competence. *Merrill-Palmer Q.* 59, 330–360. doi: 10.13110/merrpalmquar1982.59.3.0330

McClelland, M. M., Cameron, C. E., Duncan, R., Bowles, R. P., Acock, A. C., Miao, A., et al. (2014). Predictors of early growth in academic achievement: the head-toes-knees-shoulders task. *Front. Psychol.* 5:599. doi: 10.3389/fpsyg.2014.00599

Murray, J., Scott, H., Connolly, C., and Wells, A. (2018). The attention training technique improves children's ability to delay gratification: A controlled comparison with progressive relaxation. *Behav. Res. Ther.* 104, 1–6. doi: 10.1016/j.brat.2018.02.003

Mygind, L., Kurtzhals, M., Nowell, C., Melby, P. S., Stevenson, M. P., Nieuwenhuijsen, M., et al. (2021). Landscapes of becoming social: A systematic review of evidence for associations and pathways between interactions with nature and socioemotional development in children. *Environ. Int.* 146:106238. doi: 10.1016/j.envint.2020.106238

Neville, H. J., Stevens, C., Pakulak, E., Bell, T. A., Fanning, J., Klein, S., et al. (2013). Family-based training program improves brain function, cognition, and behavior in lower socioeconomic status preschoolers. *Proc. Natl. Acad. Sci.* 110, 12138–12143. doi: 10.1073/pnas.1304437110

Niedenthal, P. M. (2007). Embodying emotion. *Science* 316, 1002–1005. doi: 10.1126/science.1136930

OECD. (2020). *Teachers' well-being: A framework for data collection and analysis. Documents de travail de l'OCDE sur l'éducation, 213th*. OECD: Paris

Reder, P., McClure, M., and Jolley, A. (2000). *Family matters: Interfaces between child and adult mental health*. New York, NY: Routledge.

Richard, S., Gay, P., Clerc-Georgy, A., and Gentaz, É. (2019). Évaluation d'un entraînement basé sur le jeu de faire semblant destiné à favoriser le développement des compétences socio-émotionnelles chez les enfants de cinq ans: étude exploratoire. *Annee Psychol.* 119, 291–332. doi: 10.3917/anpsy1.193.0291

Shonkoff, J. P., and Phillips, D. A. (2000). *From neurons to neighborhoods: The science of early childhood development*. Washington DC: National Academy Press.

Solomon, T., Plamondon, A., O'Hara, A., Finch, H., Goco, G., Chaban, P., et al. (2018). A cluster randomized-controlled trial of the impact of the tools of the mind curriculum on self-regulation in Canadian preschoolers. *Front. Psychol.* 8, 1–18. doi: 10.3389/fpsyg.2017.02366

Stroop, J. R. (1935). Studies of interference in serial verbal reactions. *J. Exp. Psychol.* 18, 643–662. doi: 10.1037/h0054651

Tillmann, S., Tobin, D., Avison, W., and Gilliland, J. (2018). Mental health benefits of interactions with nature in children and teenagers: A systematic review. *J. Epidemiol. Community Health* 72, 958–966. doi: 10.1136/jech-2018-210436

Timmons, B. W., Naylor, P.-J., and Pfeiffer, K. A. (2007). Physical activity for preschool children — how much and how? *Can. J. Public Health* 98, S122–S134. doi: 10.1139/h07-112

Veiga, G. (2022). "Corpo e emoção. O papel das intervenções de mediação corporal no bem-estar emocional" in *Psicomotricidade: reflexões, contextos e mediadores*. eds. G. Veiga, J. Fernandes, A. R. Mira and J. Marmeleira (Poland: Amazon), 59–70.

Veiga, G., de Leng, W., Cachucho, R., Ketelaar, L., Kok, J. N., Knobbe, A., et al. (2017). Social competence at the playground: preschoolers during recess. *Infant Child Dev.* 26:e1957. doi: 10.1002/icd.1957

Veiga, G., Marmeleira, J., Laranjo, L., and Almeida, G. (2020). "The importance of outdoor practices for children's development and for the community" in *Taking the best from outdoor play: A practical book for parents and practitioners of early childhood education*. eds. G. Veiga, L. Laranjo, J. Marmeleira, G. Almeida and A. G. Küçükturan (Évora: Universidade de Évora), 1–14.

Veiga, G., Sousa da Silva, B. M., Gibson, J., and Rieffe, C. (2022). "Play and emotions: the role of physical play in children's social well-being" in *OUP handbook of emotion development*. eds. D. Dukes, A. C. Samson and R. Walle (London: Oxford University Press).

World Health Organization. (2019). *Guidelines on physical activity sedentary behaviour and sleep for children under 5 years of age*. Geneva, Switzerland: World Health Organization.

frontiers | Frontiers in Psychology

TYPE Original Research
PUBLISHED 09 August 2023
DOI 10.3389/fpsyg.2023.1214395

OPEN ACCESS

EDITED BY
Pedro Rosário,
University of Minho, Portugal

REVIEWED BY
Joana Carneiro Pinto,
Catholic University of Portugal, Portugal
Luis Felipe Dias Lopes,
Federal University of Santa Maria, Brazil
Saengduean Yotanyamaneewong,
Chiang Mai University, Thailand

*CORRESPONDENCE
Vítor Gamboa
✉ vgamboa@ualg.pt

RECEIVED 29 April 2023
ACCEPTED 24 July 2023
PUBLISHED 09 August 2023

CITATION
Gamboa V, Rodrigues S, Bértolo F, Marcelo B and Paixão O (2023) Socio-emotional skills profiles and their relations with career exploration and perceived parental support among 8th grade students. *Front. Psychol.* 14:1214395. doi: 10.3389/fpsyg.2023.1214395

Socio-emotional skills profiles and their relations with career exploration and perceived parental support among 8th grade students

Vítor Gamboa[1,2]*, Suzi Rodrigues[1], Filipa Bértolo[1], Beatriz Marcelo[1] and Olímpio Paixão[1]

[1]Faculty of Human and Social Sciences, University of Algarve, Faro, Portugal, [2]Research Center for Psychological Science, University of Lisbon, Lisbon, Portugal

Socio-emotional skills can play a crucial role in students career development. This study used a person-centered approach to explore socio-emotional skills (curiosity, optimism, empathy, sociability, and responsibility) profiles among 8° grade students ($N = 310$). We also explored the relations of these profiles with career exploration (self and environmental), perceived parental support (emotional support, instrumental assistance, career-related modeling, and verbal encouragement) and school achievement. Using Latent Profile Analysis (LPA), four distinct profiles emerged that differed in terms of level and shape, namely: Other and Task oriented profile, Socio-emotional Adaptive profile, Socio-emotional non-Adaptive profile, Self- Oriented profile. Our results show that the "Socio-emotional Adaptive" profile can be clearly differentiated from the "Socio-emotional non-Adaptive" profile given the higher values it presents regarding all the variables in study. However, the differences between the "Other and Task Oriented" profile and "Self-Oriented" profile (intermediate profiles) were analyzed and discussed from qualitative point-of-view and adopting an exploratory approach. Overall, the findings of this study indicate that socio-emotional profiles have the potential to account for variations in career behaviors and academic performance. These results provide valuable insights for the development and implementation of career-oriented interventions targeted at 8th grade students and their immediate relational environments.

KEYWORDS

career exploration, parental support, socio-emotional skills, latent profile analysis, person-centered approach

1. Introduction

Despite the observed differences in terminology and assessment (Schoon, 2021), nowadays it is consensual that socio-emotional skills are critical for positive development in education and career domains (Kidd, 2004; OECD, 2015). Long considered as barriers to be avoided, the advent of constructivist (e.g., Career Construction Theory; Savickas, 2005) and contextualist (e.g., Young et al., 1996) career approaches recognized the relevant role of emotions in career development, i.e., emotions and socio-emotional skills can in fact favor a successful resolution of vocational tasks and the progress in career decision-making (Hartung, 2011; Howard and

Ferrari, 2021). However, despite the theoretical expectation that socio-emotional skills clearly affect vocational behavior (e.g., career exploration) and career development, to our knowledge, empirical research is scarce and has not yet produced consistent and robust results. Additionally, the study of emotions and socio-emotional skills has been mainly conducted through variable centered approaches, which only considers linear associations between the variables in study.

Similarly, career literature reports a vast number of studies that also tend to choose a variable-centered approach (Hofmans et al., 2020). Nevertheless, as argued by Morin et al. (2011), this approach does not allow to consider that results might differ between participants and between contexts. In fact, the work of Hofmans et al. (2020) highlights that the reality cannot always be simplified through the isolated analysis of relationships between variables, which assumes population-homogeneity. Thus, they propose the person-centered approach to fill this gap and to enrich the knowledge that can be extracted from variable-centered approaches (Meyer and Morin, 2016). Additionally, this approach has the potential to help researchers to: (1) better understand the impact of distinct combinations of multiple variables, which cannot be conveniently represented using other techniques that rely on the interaction of variables among a single population distribution (Zyphur, 2009); and (2) analyze individual differences, which can lead to distinct career interventions according to the specific needs of distinct groups (Wang and Hanges, 2011; Hofmans et al., 2020).

In the field of career development, we must also consider that adolescents are not a homogenous population regarding career behavior and coping strategies (e.g., Germeijs and Verschueren, 2006; Gamboa et al., 2014; Paixão and Gamboa, 2017). According to previous research, a valid way for the field of career development research to conceptualize the heterogeneity of students (e.g., in terms of career exploration, perceived parental support) is the identification of clusters of students who display similar patterns of career behavior (Brown and Ryan-Krane, 2000; Hofmans et al., 2020). In this sense, vocational psychology (e.g., Vondracek et al., 1986; Lent et al., 2002) and human motivation theories (e.g., Ryan and Deci, 2000) have come to acknowledge the importance of a differentiated approach to the investigation and management of career issues. When it comes to adolescents, profiles based on socio-emotional skills have rarely been investigated and little is known about how these profiles explain differences in career exploration behaviors, perceived parental support and school achievement. From our point of view, investigating differences in students' career behavior (e.g., career exploration), considering distinct socio-emotional profiles, can be particularly insightful, as these constructs are central to promoting adaptive career trajectories (e.g., Paixão and Gamboa, 2017). Furthermore, knowledge on students' socio-emotional profiles is also essential for career interventions delivered in school contexts.

1.1. Socio-emotional skills

Socio-emotional skills can be defined as the ability to regulate thoughts, emotions, and behaviors, being considered a malleable construct that can be developed through formal and informal learning experiences, in school and family contexts (Kankaraš and Suarez-Alvarez, 2019). According to the literature, the development of socio-emotional skills is related with individuals' development (Malti and Noam, 2016), well-being (Chernyshenko et al., 2018; Jagers et al., 2019), academic achievement (Weissberg et al., 2015), and employment (Howard and Ferrari, 2021). In other words, we can argue that socio-emotional skills are especially important for success at school and in life. Therefore, socio-emotional skills can and should be taught, modeled, practiced, and applied to different situations in order to be used by individuals as part of more adaptive behaviors (Weissberg et al., 2015). Adolescence, as well as childhood, is a life-stage where we can observe a significant development of these types of self-regulatory skills (e.g., responsibility, optimism, curiosity), which can play a crucial role in how the individual deal with vocational tasks (e.g., the transition to secondary education) (Chernyshenko et al., 2018).

Across literature we can also notice that socio-emotional skills are commonly related to the Big Five personality traits framework. The use of this multidimensional framework in distinct psychology research subareas, allows the distinction of socio-emotional variables between skills, personality traits, thoughts, behaviors, and other related constructs (Danner et al., 2021). Hence, in our study we opted to use five socio-emotional skills (OECD, 2021a,b) aligned with each one of the Big Five framework dimensions (John et al., 2008), namely: Responsibility (Conscientiousness), Optimism (Neuroticism), Sociability (Extraversion), Empathy (Agreeableness), and Curiosity (Openness).

In order to advance with the differentiation of socio-emotional skills from related constructs, Schoon (2021) proposes an integrative taxonomy of domains and manifestations of socioemotional competences (DOMASEC), in which she states that socio-emotional skills can be addressed to each one of the Big Five dimensions and categorized as being self-oriented, other-oriented, and task-oriented. Thus, according with this taxonomy we are considering responsibility and optimism as self-orientation skills, sociability and empathy as other-oriented skills and curiosity as task-oriented skills. Schoon (2021) also considers that the nature of each skill allows the possibility to make a parallelism with the intra - and interpersonal dichotomy used by other authors (e.g., Bar-On, 1997; Di Fabio and Kenny, 2015). Intrapersonal skills would be associated with the individual ability to express its feelings, as well the awareness about its own emotions, strengths, and weaknesses (self-oriented). Alternatively, interpersonal skills are usually linked to social awareness and the ability to establish and maintain cooperative, constructive, and satisfactory interpersonal relationships (other-oriented).

1.2. Socio-emotional skills, career exploration and parental support

According to Howard and Ferrari (2021), the growing interest in the relationship between socio-emotional skills and career development stems from the idea that managing emotions facilitates exploration and progress in career decision-making. Thus, in complex vocational tasks, such as choosing a secondary school course, socio-emotional skills become more important as students must deal with stress and ambiguity associated with career exploration and career decision-making. Also, in these type of academic transitions students may also benefit from the security and structure that is provided by parental support (Kenny and Medvide, 2013; Katz et al., 2018), since

it can be crucial to enhance career exploration behaviors (Turan et al., 2014; Guan et al., 2015) and career adaptive behaviors (e.g., Whiston and Keller, 2004; Hartung et al., 2005). In other words, students with higher levels of socio-emotional skills are less likely to drop out when facing difficulties during career exploration activities (Di Fabio et al., 2012; Di Fabio and Kenny, 2015). Furthermore, according to contextual action theory of career development (Young et al., 1996), emotions play a crucial role in constructing one's career through everyday actions. For example, the role of emotions in career construction was studied by Young et al. (1997), who resort on the dialogs of 14 parent–child dyads, concluding that emotions have a regulating function in the collaborative development of career projects.

Therefore, we can expect that students with higher levels of socio-emotional skills might tend to seek more parental support on career-related issues.

Overall, despite the small number, it is possible to observe a gradual growth of studies that seek to study the role of socio-emotional variables on career behaviors (Kidd, 2004; Hartung, 2010, 2011). Most of these studies use emotional intelligence as an intrapersonal socioemotional competence, which seems to be positively associated to adaptive career behaviors (Pirsoul et al., 2022), career choice (Di Fabio and Kenny, 2011) and career decision-making self-efficacy (Di Fabio and Palazzeschi, 2008), and negatively associated to career decision-making difficulties (Di Fabio and Palazzeschi, 2009b), career indecision and indecisiveness (Di Fabio et al., 2013). Using the Career Construction Theory (CCT, Savickas, 2013), the studies of Parmentier et al. (2019) and Parmentier et al. (2022) deepened the extension of indirect relationships between these variables and found positive associations between emotional intelligence and career adaptability and, in turn, with career decision-making self-efficacy. The work of Mittal (2021) and Nieto-Flores et al. (2019), also through career adaptability, found results that suggest positive associations between emotional intelligence and job-search behavior and job-search self-efficacy. In general, the role of emotions and their use as a self-regulation strategy seem to be positively associated to career construction (Young et al., 1997), and negatively to university indecisiveness (Farnia et al., 2018) and amount of occupational information (Santos et al., 2018). Finally, by using the Big Five model of personality as main framework, Di Fabio and Palazzeschi (2009b) found a negative correlation between career difficulties and extraversion and positive with neuroticism, and Li et al. (2015) present openness to experience, agreeableness, and conscientiousness as predictors of higher levels of career exploration. In summary, we can infer that socio emotional skills are positively associated with career exploration and perceived parental support.

1.3. Socio-emotional skills and school achievement

Generally, socio-emotional skills have been considered crucial for school achievement (Weissberg et al., 2015). Empirical research revealed that whether being considered as resources, competences, skills, or behaviors, socio-emotional variables seem to be positively related to school variables (directly and indirectly), namely: school readiness (Duncan et al., 2007), school achievement (Sudkamp et al., 2017), and academic well-being (Duncan et al., 2007; Durlak et al., 2011; Wilkins et al., 2015; Sudkamp et al., 2017; Roberts et al., 2018). Moreover, socio emotional skills can be considered protective factors against school drop-out and can promote academic engagement (Salmela-Aro and Upadyadya, 2020). The work of Durlak et al. (2011) provided empirical evidence on the impact of socio-emotional skills on school achievement. In a meta-analysis that included 213 school-based Socio Emotional Learning.

(SEL) programs, SEL participants demonstrated a significant improve on social and emotional skills and academic performance, when compared to controls. Overall, Durlak et al. (2011) acknowledges socio-emotional learning programs as a promising approach that enhances children's success in school and in life. More recently, Chernyshenko et al. (2018) highlight that socio-emotional skills can have direct and indirect effects on school outcomes. For example, being curious and open-minded and having an active approach toward learning is an important pre-requisite for developing and improving innate cognitive capacities. Additionally, empathy can also be helpful to children's adaptation to the school environment, to gain higher status among their peers and, consequently, to achieve better academic results.

1.4. The present study

Using person-centered approach, the present study aims to, firstly, differentiate profiles based on socio-emotional skills (OECD, 2021a,b). Secondly, considering the outcomes that we have found in literature we intend to analyze the differences between the emerged profiles regarding career exploration, perceived parent support and school achievement, in order to conceptualize and discuss them.

To our knowledge, research that intent to conceptualize profiles based on socio-emotional variables are very scarce and vary on the theoretical framework on its basis. Whitin these studies we can observe that commonly two profiles are extracted, being typically labeled based on their high or low socio-emotional levels. Also, a third profile regularly emerges as an intermediate profile and is analyzed with an exploratory approach given that their levels are not as theoretically normative as the rest of the profiles (e.g., Sudkamp et al., 2017; Castro-Kemp et al., 2019; Pulido-Martos et al., 2022). For example, Castro-Kemp et al. (2019) research organized the profiles based on four socio-emotional variables: gratitude, optimism, zest, and persistence. Here they found that the profile with lowest levels of optimism presented lower levels of socioemotional health and greater emotional and behavioral school-related difficulties. The work of Pulido-Martos et al. (2022) self-esteem and emotional intelligence are considered as socioemotional resources. They found a profile with low levels socio-emotional resources that also presented the lowest levels of perceived social support (from parents, peers, and teachers), self-emotional and others appraisal and emotional regulation. Contrarily, a profile with high socioemotional resources emerged with high levels of the mentioned variables. Sudkamp et al. (2017) conceptualized their profiles based on cognitive (IQ) and socio-emotional competences (academic self-concept, academic motivation, and achievement-related anxiety) and realized that the profile with higher levels of socio-emotional competences is the one that also shows higher IQ levels and the best school achievement when compared to the rest of the groups. In contrast, the group with lower socio-emotional competences present lower IQ and low school achievement.

In this study we use Latent Profile Analysis (LPA) to address our first goal, which is a method commonly used among person-centered approaches in career research. It consists in a categorical latent variable modelling approach that aims to identify subpopulations (latent profiles) within a population, based on a similarity pattern that they share among a certain set of variables (LPA indicators). According to Spurk et al. (2020), in the past decade we can observe an increment in the use of this method in the study of career-related variables. However, despite the potential to address specific research questions and to expand theoretical knowledge regarding career predictors and outcomes, as well as the individual's heterogeneity among career subjects, variable-centered approach still predominates and the application of LPA is still very scarce (Hirschi and Valero, 2015; Gillet et al., 2018; Hofmans et al., 2020; Spurk et al., 2020).

We could expect the emergence of two distinct socio-emotional profiles, that according to the evidence should be clearly distinguishable in quantity, i.e., a profile with higher levels of socio-emotional skills associated to higher levels on career exploration behaviors, higher levels on perceived parental support, higher grades, and lower school failure percentage than the other profile. In other words, these two socio-emotional profiles will display significant differences in terms of career exploration, parental support, and school achievement. However, the empirical research we analyzed on socio-emotional skills and vocational behavior show solutions with three or more profiles (e.g., Parmentier et al., 2022; Pirsoul et al., 2022), identifying groups with intermediate levels of socio-emotional skills, which might present less predictable levels for career-related and school achievement variables. For these intermediate profiles we adopted an exploratory approach to their conceptualization and respective discussion.

2. Methods

2.1. Participants and procedure

The sample comprises 310 students, being 163 males (52.6%) and 147 females (47.4%) with ages between 13 and 15 years old ($M = 13.38$, $SD = 0.62$), from six public schools in the southern Portugal. In addition to this demographic information, we also collected academic achievement data, namely the grades in Portuguese and Math subjects (1–5 points) and whether the students failed any course of study (school failure rate). For the Portuguese subject grades varied between 2 and 5, being the mean value 3.25 ($SD = 0.69$) and for Math grades the values ranged from 1 to 5 and the mean value was 3.17 ($SD = 0.92$). Regarding school failure rate, 24.5% said that they have failed one or more times and 75.5% replied that they had not failed until the date of data collection.

2.2. Procedure

The study was presented to schools in an initial phase and the appropriate informed consent procedures and permissions were gathered from parents and school board. Data collection was made by trained coresearchers in classroom context, with the assistance of the school psychologist. Participants were informed about the general subject of the study and that their participation was voluntary and confidential. On average, each assessment required 25 min.

2.3. Measures

We assessed socio-emotional skills with the Portuguese version of Socio-Emotional Skills Survey (SSES; OECD, 2021a,b), provided by Calouste Gulbenkian Foundation, which aims to better understand students' contextual factors (e.g., school, home, community) and the characteristics that directly or indirectly influence the development of social and emotional skills. The SSES conceptual framework is based on the OECD framework (Chernyshenko et al., 2018; Kankaraš and Suarez-Alvarez, 2019) and was developed in reference to the 'Big Five Model' (John et al., 2008) that distinguishes 15 skills in five dimensions: (1) Task Performance (self-control, responsibility, persistence); (2) Emotional Regulation (stress resistance, optimism, emotional control); (3) Collaboration (empathy, trust, cooperation); (4) Open-Mindedness (tolerance, curiosity, creativity); (5) Engaging with Others (sociability, assertiveness, energy). In this study, we used responsibility, optimism, empathy, curiosity, and sociability as the skills that represent each dimension, respectively. The validity and reliability of the scale have been demonstrated in other studies, reporting Cronbach's alpha that ranged from 0.80 and 0.81 (e.g., Kankaraš and Suarez-Alvarez, 2019; Salmela-Aro and Upadyadya, 2020). In this study, internal consistency value for the scale was 0.94.

The perceived parental support was assessed with the *Career-Related Parent Support Scale* (CRPSS, Turner et al., 2003; adapt. Gamboa et al., 2021). It aims to assess students' perceptions of parental support toward career and educational development along the four sources of self- efficacy expectations proposed by Bandura (1997). The scale comprises 27 items distributed among four subscales: (1) Instrumental Support (6 items, e.g., "My parents help me to choose out-of-school activities that may be useful in my future professional career"); (2) Career Modelling (7 items, e.g., "My parents have already shown me where they work"); (3) Verbal Persuasion (5 items, e.g., "My parents praised me for doing my schoolwork well"); and (4) Emotional Support (6 items, e.g., "My parents say they are proud of me when I am successful in school"). Items were rated using a 5-point Likert-type scale (1 – strongly disagree to 5 – strongly agree), and higher scores represent greater perceived parental support. The validity and reliability of the scale was demonstrated both in the original version (Turner et al., 2003), and in the Portuguese version (Gamboa et al., 2021). In our study, Cronbach Alpha values for the total scale was 0.93, while for the subscales the values varied between 0.79 (Verbal Encouragement) and 0.88 (Emotional Support).

Career exploration was assessed using the Portuguese version of the Career Exploration Survey (CES; Stumpf et al., 1983; adapt. Taveira, 1997). The CES is a multidimensional self- administered survey with 53 items (Likert-type response format), designed to assess beliefs, processes, and reactions to career exploration. We only used the items that compose two processes of career exploration: Self-Exploration (5 items, e.g., "In the last 3 months I reflected on how my past integrates with my future career") and Environmental Exploration (4 items, e.g., "In the last 3 months I went to various career orientation programs"). The validity, reliability, and multidimensionality of the CES have been widely demonstrated in its' different versions. Cronbach's alpha for the Portuguese version ranged from 0.63 to 0.83.

TABLE 1 Means, standard deviation, internal consistency, and bivariate correlations between all variables in study ($N = 310$).

	M	DP	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Responsibility	3.40	0.61	(0.75)	0.35**	0.20**	0.31**	0.42**	0.10	0.25**	0.27**	0.29**	0.29**	0.32**	0.34**	0.35**
2. Optimism	3.68	0.78		(0.86)	0.51**	0.27**	0.35**	0.15**	0.22**	0.40**	0.36**	0.27**	0.41**	0.13**	0.09
3. Sociability	3.72	0.71			(0.81)	0.43**	0.40**	0.29**	0.25**	0.42**	0.34**	0.31**	0.35**	0.05	−0.02
4. Empathy	3.69	0.55				(0.72)	0.55**	0.27**	0.39**	0.45**	0.32**	0.41**	0.41**	0.24**	0.07
5. Curiosity	3.87	0.65					(0.83)	0.20**	0.39**	0.41**	0.38**	0.33**	0.44**	0.30**	0.15**
6. Environmental exploration	2.81	1.06						(0.81)	0.63**	0.42**	0.42**	0.29**	0.25**	0.06	0.01
7. Self-exploration	3.16	0.95							(0.77)	0.52**	0.46**	0.31**	0.39**	0.13**	0.10
8. Emotional support	3.74	0.95								(0.88)	0.79**	0.55**	0.75**	0.19**	0.04
9. Instrumental assistance	3.63	0.86									(0.80)	0.55**	0.72**	0.25**	0.09
10. Career-related modeling	4.16	0.75										(0.82)	0.56**	0.22**	0.03
11. Verbal encouragement	4.31	0.69											(0.79)	0.34**	0.17**
12. Portuguese grade	3.25	0.69													0.59**
13. Math grade	3.17	0.92													

*$p < 0.05$; **$p < 0.01$. Internal consistency for each variable is presented between parentheses.

Research that used this version found internal consistency values for the two exploration processes used in this study between 0.74 and 0.79 (Paixão and Gamboa, 2017, 2022; Gamboa et al., 2021), which is aligned with the values we found in our study (Environmental Exploration = 0.81; Self- Exploration = 0.77).

2.4. Analysis

In the first step, we computed the means, standard deviations, correlations, and internal consistency for the variables in study. Secondly, we performed Latent Profile Analysis (LPA) in Jamovi (2.3.21) software to identify profiles based on the chosen socio-emotional variables. Normality of each profile was tested using the criteria mentioned by Marôco (2010). Bootstrapped likelihood ratio test (BLRT), Akaike Information Criterion (AIC), Bayesian Information Criterion (BIC), Sample size-adjusted BIC (SABIC), and Entropy were used to determine the optimal number of profiles. With exception made for Entropy, lower values of these criteria indicate better model fit and parsimony (Nylund et al., 2007). Entropy values range from 0 to 1 and, contrarily to the other used criteria, the higher the value the better differentiations between profiles (Celeux and Soromenho, 1996) and values between 0.60 and 0.80 are considered as appropriate (Muthén, 2004; Jung and Wickrama, 2008). Furthermore, significant *p*- values for BLRT means that the current k-class model fits better than the model with k + 1 classes (Nylund et al., 2007). Finally, profile membership was used in a multivariate analysis of variance (MANOVA), and through post-hoc tests we examined differences between the socio-emotional profiles (independent variables) regarding career exploration behaviors, perceived parental support and Portuguese and Math's grades (dependent variables).

3. Results

Table 1 shows the descriptive and correlation results between variables in study. Overall, we can observe positive and significant correlations between almost all variables in study, with exception for the one between responsibility and environmental exploration. Concerning academic achievement variables, Portuguese grades presented positive association with all variables except with sociability and environmental exploration. Math grades only seem to be positively correlated to responsibility ($r = 0.35$, $p < 0.01$), curiosity ($r = 0.15$, $p < 0.01$), verbal encouragement ($r = 0.17$, $p < 0.01$), and Portuguese grades ($r = 0.59$, $p < 0.01$). Cronbach alpha values are within those that literature presents as adequate (Marôco, 2010).

We performed LPA using responsibility, optimism, sociability, empathy, and curiosity as latent profile indicators. To ensure that all measures contributed equally to the analysis, we standardized the original mean values to generate a set of z-scores ($M = 0$, SD = 1). To determine the optimal number of latent profiles, we followed a stepwise approach starting with a solution with two profiles and successively looking the fit indices regarding a solution with one more profile (Nylund et al., 2007). Also, we tried to ensure that none of the profiles presented a total of subjects that could be considered too low (less than 3%), so that we could be able to find statistically significant differences between profiles for each variable, and that each one could be theoretically relevant and meaningful (Marôco, 2010; Spurk et al., 2020). Considering these criteria, we opted for the 4-profile solution which presented adequate values for AIC (6782), BIC (6901), SABIC (6812) and significant BLRT (62.27; $p < 0.05$) and an Entropy value (0.74).

Figure 1 shows the graphical distribution of each profile according to the respective z-scores for each variable in study. The first profile ($N = 45$, 14.5%) was labeled as "Other and Task- Oriented." Concerning the socio-emotional skills, this group is characterized by z-score values below the mean value for responsibility (−0.28), optimism (−1.15) and sociability (−0.29) and above the mean value for empathy (0.23) and curiosity (0.19). It also presents values below the mean value for environmental exploration (−0.04) self-exploration (−0.04), emotional support (0.21) and instrumental support (−0.05). Finally, shows positive z-scores for career-related modeling (0.02), verbal encouragement (0.01), Portuguese grades (0.21) and the highest value for Math grades (0.15). Also, this profile presents a school failure of 22.2% (the second lowest among all profiles).

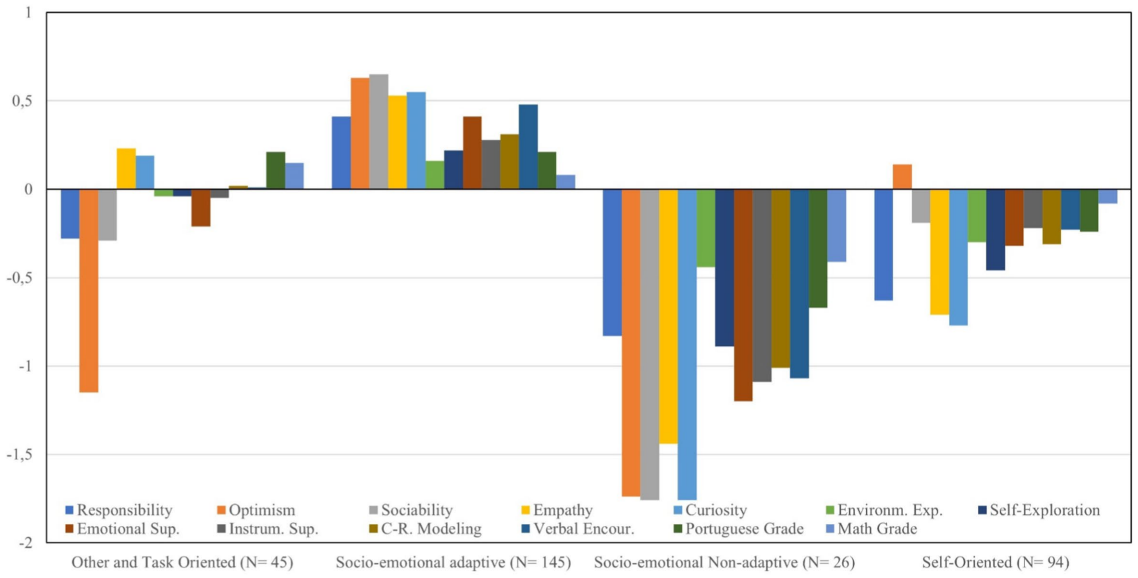


FIGURE 1
Profile results based on *z*-scores of the socio-emotional skills and criterion variables for the four profile solution.

The second profile ($N = 145$, 46.8%), which includes the largest number of participants, was labeled as "Socio-emotional Adaptive," as it shows the highest z-score levels for all socio- emotional variables. Concerning the remaining variables it also presents the highest values among all profiles, except for Portuguese grade (0.21), which is equal to the first groups value, and Math grades (0.08). Additionally, this was the profile with the lowest school failure rate (20.7%).

The third profile (N = 26, 8.4%) was labeled as "Socio-emotional non-Adaptive" and has the smallest number of participants. This group is characterized by the lowest z-scores among all socio-emotional variables when compared with the other extracted profiles. Moreover, regarding dependent variables, this profile shows the lowest z-scores and the highest school failure rate (46.2%).

Lastly, the fourth profile ($N = 94$, 30.3%) was labeled as "Self-Oriented" as it reveals z- scores values below the mean value for all socio-emotional variables except for optimism (0.14). This group also presents z-scores above the mean value for the remaining variables in study and a school failure rate of 25.5%.

In the next step, we performed chi-squared test to examine whether there was any relationship between student's gender and their profile. A significant relationship was found (χ^2 (3) = 14.1, $p < 0.05$), so we controlled this variable in the subsequent analyses. By performing univariate analysis of covariance, we can observe that the profiles differ significantly for all variables in study. Finally, we conducted *post hoc* Tukey's honestly significant difference tests to examine with better detail how the groups differed regarding career exploration, perceived parental support and Portuguese and Math's grades.

Table 2 shows global means, standard deviations, and z-scores for the four-profile solution, as well the number of subjects for each group and their respective school failure rate. It also shows the results of the analyses of variance that were performed to determine the relative contribution of the different socio-emotional variables to the differentiation of the profiles, as well as the corresponding effect size (η^2). The variables that contributed the most to discrimination among the groups were optimism, F (3, 310) = 168.1, $p < 0.01$, $\eta^2 = 0.62$, and curiosity, F (3, 310) = 106.2, $p < 0.01$, $\eta^2 = 0.51$.

The results reveal that the "Socio-emotional adaptive" group and the "Socio-emotional nonadaptive" profile differed significantly at all variables except for Math's grades. The comparison between "Socio-emotional adaptive" profile and the "Other and task-oriented" group shows significant differences for emotional support, verbal encouragement and for all socio-emotional skills, except for empathy. When comparing "Socio-emotional adaptive" group the "Self-Oriented" group, significant differences can be seen for all variables in study, with exception for Math's grades. "Socio-emotional non-adaptive" profile is significantly different at all variables except for environmental exploration and Math's grade from "Other and Task- oriented group." When compared with "Self-Oriented" profile, the "Socio-emotional nonadaptive" group shows differences for all parent support variables and for all socio- emotional skills, except responsibility. Finally, "Other and task-oriented" profile and "Self-Oriented" group reveal significant differences for optimism, empathy, curiosity, and Portuguese grades.

4. Discussion

To our knowledge research that conceptualized socio-emotional profiles are very scarce, and the number of studies that tried to assess the differences of such profiles among career-related variables are even fewer. The present study had a twofold purpose. Firstly, we used LPA to identify profiles based on socio-emotional skills measured with the SSES (OECD, 2021a,b), which was developed in reference to the 'Big Five Model' (John et al., 2008). Second, we sought to verify how the profiles would differentiate among exploration behaviors (environmental exploration and self-exploration), perceived

TABLE 2 Means, standard deviations, and *z*-scores for the Latent profiles and criterion variables in the four profiles ($N = 310$).

	Group 1 ($N = 45$)			Group 2 ($N = 145$)			Group 3 ($N = 26$)			Group 4 ($N = 94$)			F	p	η^2
	M	(DP)	z	M	(DP)	z	M	DP	z	M	DP	z			
Responsibility	3.29^{a}	(0.54)	−0.28	3.73^{b}	(0.56)	0.41	2.95^{c}	(0.58)	−0.83	$3.07^{a,c,d}$	(0.74)	−0.63	37.4	0.00	0.27
Optimism	2.77^{a}	(0.45)	−1.15	4.15^{b}	(0.45)	0.63	2.31^{c}	(0.66)	−1.74	3.77^{d}	(0.63)	0.14	168.1	0.00	0.62
Sociability	3.47^{a}	(0.57)	−0.29	4.13^{b}	(0.51)	0.65	2.44^{c}	(0.63)	−1.76	$3.55^{a,d}$	(0.71)	−0.19	89.0	0.00	0.47
Empathy	3.84^{a}	(0.36)	0.23	$4.01^{a,b}$	(0.44)	0.53	2.92^{c}	(0.50)	−1.44	3.32^{d}	(0.61)	−0.71	89.2	0.00	0.46
Curiosity	4.04^{a}	(0.39)	0.19	4.26^{b}	(0.40)	0.55	2.84^{c}	(0.69)	−1.76	3.45^{d}	(0.72)	−0.77	106.2	0.00	0.51
Environm. Exp.	2.83^{a}	(1.05)	−0.04	$3.03^{a,b}$	(1.07)	0.16	$2.41^{a,c}$	(1.11)	−0.44	$3.56^{a,c,d}$	(0.97)	−0.30	6.3	0.00	0.06
Self-Exp.	3.23^{a}	(0.93)	−0.04	$3.48^{a,b}$	(0.84)	0.22	2.45^{c}	(0.99)	−0.89	$2.84^{a,c,d}$	(0.96)	−0.46	16.5	0.00	0.14
Emotional Sup.	3.58^{a}	(0.99)	−0.21	4.14^{b}	(0.68)	0.41	2.67^{c}	(1.14)	−1.20	$3.48^{a,d}$	(0.92)	−0.32	28.7	0.00	0.22
Instrum. Sup.	3.61^{a}	(0.77)	−0.05	$3.90^{a,b}$	(0.74)	0.28	2.73^{c}	(1.06)	−1.09	$3.47^{a,d}$	(0.91)	−0.22	18.2	0.00	0.15
C-R. Modeling	4.20^{a}	(0.73)	0.02	$4.41^{a,b}$	(0.63)	0.31	3.42^{c}	(0.95)	−1.01	$3.94^{a,d}$	(0.93)	−0.31	19.9	0.00	0.16
Verbal Encour.	4.26^{a}	(0.75)	0.01	4.61^{b}	(0.42)	0.48	3.47^{c}	(0.92)	−1.07	$4.09^{a,d}$	(0.88)	−0.23	33.1	0.00	0.25
Portuguese grade	3.40^{a}	(0.65)	0.21	$3.39^{a,b}$	(0.72)	0.21	2.79^{c}	(0.66)	−0.67	$3.09^{c,d}$	(0.57)	−0.24	8.72	0.00	0.08
Math grade	3.31^{a}	(0.87)	0.15	$3.24^{a,b}$	(0.94)	0.08	$2.79^{a,b,c}$	(0.98)	−0.41	$3.10^{a,b,c,d}$	(0.89)	−0.08	2.20	0.08	0.02
													χ^2	p	
Gender													14.1	0.00	
Male/Female (N)	14/31			75/70			13/13			61/33					
Male/Female (%)	31/69			52/48			50/50			64/36					
School failure (%)	22.2			20.7			46.2			25.5					

career-related parent support, and academic achievement (school failure rate, Portuguese, and Math grades).

A four-profile solution was found to be the one that gathered the best consensus concerning the evaluated psychometric properties and the followed theoretical assumptions.

As expected, LPA revealed heterogeneity within the sample. A group of students emerged with the highest levels of all socio-emotional skills, career exploration and perceived parental support among all profiles, being labeled as "Socio-emotional Adaptive." In other hand, a profile of students with the lowest levels across all the variables also emerged and was labeled as "Socio-emotional non-Adaptive." In fact, we can find evidence in literature for the positive association between socio-emotional variables and career adaptive behaviors and processes in literature, such as career adaptability (e.g., Parmentier et al., 2019), job-search self-efficacy (e.g., Nieto-Flores et al., 2019), career choice (e.g., Pirsoul et al., 2022), career decision-making self-efficacy (e.g., Di Fabio and Palazzeschi, 2009b; Di Fabio and Kenny, 2011) and negative association to career indecision (e.g., Di Fabio et al., 2013). Additionally, the school achievement values for these two profiles corroborate the suggestions of studies that associate high levels of socio-emotional skills with higher school achievement (Sudkamp et al., 2017), and lower levels to academic difficulties (Castro-Kemp et al., 2019). Thus, "Socio-emotional Adaptive" is the group with the least percentage of school failure and has Portuguese and Math grades above the mean value. Contrarily, the "Socio-emotional non-Adaptive" group shows up as the group with the poorer school achievement and the highest percentage of school failure among all the emerged profiles.

The remaining two profiles found do not present a combination of socio-emotional skills and career-related levels as theoretically normative as those described above, and therefore, we adopted an exploratory approach to conceptualize and to compare them. First, we obtained a group of students with levels above the mean value for empathy and curiosity. Inspired by the DOMASEC taxonomy (Schoon, 2021), we decided to label it as the "Other and Task Oriented" profile. The other profile emerges as having positive z-scores for optimism. By comparing these two profiles, we can observe that the "Other and Task Oriented" group presents higher levels of career exploration and perceived parental support than the "Self-Oriented" group. They also differ regarding school achievement, since that "Self-Oriented" profile shows poorer grades in Portuguese and Math subjects and a percentage of school failure higher than the "Other and Task Oriented" profile. From a qualitative perspective the "Other and Task Oriented" profile corroborates the results obtained by Li et al. (2015), who found positive associations between conscientiousness, agreeableness, and openness to exploration behaviors. The study of Chernyshenko et al. (2018) also suggested a positive association between curiosity and the improvement of cognitive capacities, which can lead to better academic outcomes. In our study we used responsibility, empathy, and curiosity to represent, respectively, these three dimensions of the Big Five framework (John et al., 2008). The results of the "Self-Oriented" profile can also be in accordance with literature if we consider optimism as the socio-emotional skill aligned with neuroticism, which is considered an intrapersonal and Self-Oriented skill (e.g., Bar-On, 1997; Di Fabio and Kenny, 2015; Schoon, 2021). Also, the neuroticism it can be also associated to an emotionally negative or instable individual, and nervousness (John et al., 2008). In fact, Di Fabio and Palazzeschi (2009a) found positive associations between neuroticism and career difficulties. Therefore, the statistically significant differences that the "Other and Task Oriented" profile present the "Self-Oriented" group

regarding socio-emotional skills may be the reason why the first group obtains higher levels at the career-related and school achievement variables.

Finally, if we compare the "Other and Task Oriented" profile with the "Socio-emotional Adaptive" profile (the only profile with exploration levels above the mean value) we can observe that they differ at the responsibility, optimism and sociability levels. If we look at career exploration as a complex and goal-oriented process that implies some level of persistence and organization, we may consider that curiosity and empathy (as socio-emotional skills) may not be enough to lead exploratory behavior to more expressive levels. Thus, a broader set of socio- emotional skills may be needed to ensure higher levels of exploration. For example, responsibility, as a skill defined as the ability to honor commitments and be punctual and reliable (OECD, 2021a,b), could be an important self-regulatory competence to achieve greater exploration.

5. Theoretical and practical implications

The present study contributes to the development of person-centered approaches to the study of the influence of socio-emotional skills on vocational behaviors. Theoretically, our results reveal that it is possible to differentiate profiles based on the individual's socio-emotional skills from a quantitative point of view (high and low levels of socio-emotional skills), but also from a qualitative perspective (intermediate levels of socio-emotional skills). This draws the attention to the fact that distinct combinations of skills might result in distinct vocational behaviors and, consequently, different career and academic outcomes. In sum, according to our results, we can conclude that adolescents are not a homogeneous group regarding socio-emotional skills and that socio-emotional profiles are able to explain significant differences in career behaviors and school achievement. However, the fact that we opted for a person-centered approach does not necessarily mean that this should replace variable-centered approaches, but rather complement each other, in order to provide greater robustness to the results and richness in their discussion (Wang and Hanges, 2011; Meyer and Morin, 2016).

The results can also offer insights to the conceptualization and preparation of vocational interventions, namely those which aim to involve the individual's relational contexts in order to promote the development of socio-emotional skills at the service of career behaviors. In the educational context, for example, the results highlight the importance of developing a curriculum that combines socio-emotional skills and career education, helping students to develop skills in different domains (i.e., self-oriented, other oriented and task oriented) that, in turn, can enhance their vocational development.

From the career intervention viewpoint, "Socio-emotional Adaptive" students will benefit from less control from teachers and parents, and more autonomy in the exploration process. Also, great diversity of opportunities to explore occupational realities and to reflect about themselves should be considered. Globally, this will enhance these student's perceptions of agency and authorship. In contrast, the "Socio-emotional Non-Adaptive" students, as the least favorable career profile, should benefit from highly structured career interventions. For example, career counselors should organize exploration activities in a step-by-step procedure with specific goals. Additionally, given the low values of socio-emotional skills presented by this group of students, socio-emotional learning interventions should be provided in order to support career adaptive development.

Finally, considering that a set of socio-emotional skills seems to be needed to reach more adaptive career behaviors (rather than isolated skills), the "Other and Task Oriented" and "Self- Oriented" profiles should also benefit from socio-emotional learning training. For example, these profiles should benefit from activities that promote curiosity, optimism and responsibility, such as, oriented exploratory activities with specific deadlines (organized with grids), followed by group sessions to debrief the gathered information.

In sum, the possibility to organize students by their socio-emotional skills leads us to reaffirm the importance of differential career interventions practices. These practices should be based in complete information regarding socio-emotional profiles of students and the quality of family and school contexts.

6. Limitations and future research

Although our study can represent a contribute to the positive aspects of person-centered approaches, there are some limitations that need to be underlined. One of them is directly related to LPA method, which seems to be sensitive to sample sizes and, consequently to the overextraction of profiles (Meyer and Morin, 2016; Spurk et al., 2020). This issue can be controlled using appropriate fit indices, as suggested by Muthén (2004) and Nylund et al. (2007). Being a multivariate exploratory method can also be a concern on the use of LPA. However, we suggest to not blindly follow statistical criteria on the extraction of the profiles and try to also ensure that there is not great disparity between the extracted profiles, and that they can be theoretically relevant and meaningful (Marôco, 2010).

Our results are limited to the role of socio-emotional skills on career behaviors, and, therefore, they should not be generalized to proximal constructs, such as emotional intelligence or socio-emotional learning. According to the suggestions of Howard and Ferrari (2021) and Schoon (2021), an integrative framework is needed to clearly differentiate the relationship that socio-emotional variables may have with career constructs, as either being skills, traits, or behaviors.

Future research should ensure the use of other indicators beyond self-reported measures, such as parents and teachers' versions of socio-emotional skills, to clarify the extent to which these aspects are related to students' socio-emotional and career profiles. Moreover, our study adopted a cross-sectional design, limiting our ability to make any inferences about the causal relations between the antecedents and outcomes of the socio-emotional profiles. Thus, in the future should focus on longitudinal studies in order to better investigate the developmental trajectories of each of socio-emotional profiles.

Finally, our study does not clearly consider career outcome variables, such as career indecision. Future research should include variables that can assume this role to take full advantage of the person-centered approach, which can lead to the development of assumptions that guide to confirmatory studies (Muthén, 2004).

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Ethics statement

The studies involving human participants were reviewed and approved by the data protection office of the University of Algarve and ethics committee of the University of Algarve. Written informed consent to participate in this study was provided by the participants' legal guardian/next of kin.

Author contributions

VG designed the study and wrote the first draft of the manuscript. All authors contributed to the study concept and design and discussed the data analyses, contributed to the article and approved the submitted version.

Funding

The work was supported by the Fundação Calouste Gulbenkian, as part of their Gulbenkian Academies of Knowledge initiative, which financed the open access publication fees.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Publisher's note

References

Bandura, A. (1997). *Self-efficacy: the exercise of control*. New York: W.H. Freeman and Company.

Bar-On, R. (1997). *The Bar–On emotional quotient inventory (EQ-i): a test of emotional intelligence*. Toronto: Multi-Health Systems.

Brown, S. D., and Ryan-Krane, N. E. (2000). "Four (or five) sessions and a cloud of dust: old assumptions and new observations about career counseling" in *Handbook of counseling psychology*. eds. S. D. Brown and R. W. Lent. *3rd* ed (New York: John Wiley & Sons, Inc), 740–766.

Castro-Kemp, S., Palikara, O., Gaona, C., Eirinaki, V., and Furlong, M. J. (2019). The role of psychological sense of school membership and postcode as predictors of profiles of socio-emotional health in primary school children in England. *Sch. Ment. Heal.* 12, 284–295. doi: 10.1007/s12310-019-09349-7

Celeux, G., and Soromenho, G. (1996). An entropy criterion for assessing the number of clusters in a mixture model. *J. Classif.* 13, 195–212. doi: 10.1007/BF01246098

Chernyshenko, O. S., Kankaraš, M., and Drasgow, F. (2018). *Social and emotional skills for student success and well-being*. Paris: OECD Publishing.

Danner, D., Lechner, C. M., and Spengler, M. (2021). Editorial: do we need socio-emotional skills? *Front. Psychol.* 12:723470. doi: 10.3389/fpsyg.2021.723470

Di Fabio, A., and Kenny, M. E. (2011). Promoting emotional intelligence and career decision making among Italian high school students. *J. Career Assess.* 19, 21–34. doi: 10.1177/1069072710382530

Di Fabio, A., and Kenny, M. E. (2015). The contributions of emotional intelligence and social support for adaptive career progress among Italian youth. *J. Career Dev.* 42, 48–59. doi: 10.1177/0894845314533420

Di Fabio, A., and Palazzeschi, L. (2008). Emotional intelligence and self-efficacy in a sample of Italian high school teachers. *Soc. Behav. Personal. Int. J.* 36, 315–326. doi: 10.2224/sbp.2008.36.3.315

Di Fabio, A., and Palazzeschi, L. (2009a). An in-depth look at scholastic success: fluid intelligence, personality traits or emotional intelligence? *Personal. Individ. Differ.* 46, 581–585. doi: 10.1016/j.paid.2008.12.012

Di Fabio, A., and Palazzeschi, L. (2009b). Emotional intelligence, personality traits and career decision difficulties. *Int. J. Educ. Vocat. Guid.* 9:135146, 135–146. doi: 10.1007/s10775-009-9162-3

Di Fabio, A., Palazzeschi, L., Asulin-Peretz, L., and Gati, I. (2013). Career indecision versus indecisiveness: associations with personality traits and emotional intelligence. *J. Career Assess.* 21, 42–56. doi: 10.1177/1069072712454698

Di Fabio, A., Palazzeschi, L., and Bar-On, R. (2012). The role of personality traits, core self- evaluations, and emotional intelligence in career decision-making. *J. Career Assess.* 20, 294–309. doi: 10.1177/1069072712448431

Duncan, G. J., Dowsett, C. J., Claessens, A., Magnuson, K., Huston, A. C., Klebanov, P., et al. (2007). School readiness and later achievement. *Dev. Psychol.* 43, 1428–1446. doi: 10.1037/0012-1649.43.6.1428

Durlak, J. A., Weissberg, R. P., Dymnicki, A. B., Taylor, R. D., and Schellinger, K. B. (2011). The impact of enhancing students' social and emotional learning: a meta-analysis of school- based universal interventions. *Child Dev.* 82, 405–432. doi: 10.1111/j.14678624.2010.01564.x

Farnia, F., Nafukho, F. M., and Petrides, K. V. (2018). Predicting career decision-making difficulties: the role of trait emotional intelligence, positive and negative emotions. *Front. Psychol.* 9:1107. doi: 10.3389/fpsyg.2018.01107

Gamboa, V., Paixão, M. P., and Jesus, S. N. (2014). Vocational profiles and internship quality among Portuguese VET students. *Int. J. Educ. Vocat. Guid.* 14, 221–244. doi: 10.1007/s10775-014-9268-0

Gamboa, V., Paixão, O., and Rodrigues, S. (2021). Validação da Career-Related Parent Support Scale numa amostra de estudantes portugueses. *Psychologica* 64, 121–140. doi: 10.14195/1647-8606_64-1_6

Germeijs, V., and Verschueren, K. (2006). High school students' career decision-making process: a longitudinal study of one choice. *J. Vocat. Behav.* 68, 189–204. doi: 10.1016/j.jvb.2005.08.004

Gillet, N., Morin, A. J., Sandrin, E., and Houle, S. A. (2018). Investigating the combined effects of workaholism and work engagement: a substantive-methodological synergy of variable- centered and person-centered methodologies. *J. Vocat. Behav.* 109, 54–77. doi: 10.1016/j.jvb.2018.09.006

Guan, Y., Wang, F., Liu, H., Ji, Y., Jia, X., Fang, Z., et al. (2015). Career specific parental behaviors, career exploration and career adaptability: a three-wave investigation among Chinese undergraduates. *J. Vocat. Behav.* 86, 95–103. doi: 10.1016/j.jvb.2014.10.007

Hartung, P. J. (2010). Practice and research in career counseling and development—2009. *Career Dev. Q.* 59, 98–142. doi: 10.1002/j.2161-0045.2010.tb00057.x

Hartung, P. J. (2011). Barrier or benefit? Emotion in life-career design. *J. Career Assess.* 19, 296–305. doi: 10.1177/1069072710395536

Hartung, P. J., Porfeli, E. J., and Vondracek, F. W. (2005). Child vocational development: a review and reconsideration. *J. Vocat. Behav.* 66, 385–419. doi: 10.1016/j.jvb.2004.05.006

Hirschi, A., and Valero, D. (2015). Career adaptability profiles and their relationship to adaptivity and adapting. *J. Vocat. Behav.* 88, 220–229. doi: 10.1016/j.jvb.2015.03.010

Hofmans, J., Wille, B., and Schreurs, B. (2020). Person-centered methods in vocational research. *J. Vocat. Behav.* 118, 103398–103315. doi: 10.1016/j.jvb.2020.103398

Howard, K. A., and Ferrari, L. (2021). Social-emotional learning and career development in elementary settings. *Br. J. Guid. Couns.* 50, 371–385. doi: 10.1080/03069885.2021.1959898

Jagers, R. J., Rivas-Drake, D., and Williams, B. (2019). Transformative social and emotional learning (SEL): toward SEL in service of educational equity and excellence. *Educ. Psychol.* 54, 162–184. doi: 10.1080/00461520.2019.1623032

John, O. P., Naumann, L. P., and Soto, C. J. (2008). "Paradigm shift to the integrative big-five trait taxonomy: history, measurement, and conceptual issues" in *Handbook of*

personality: theory and research. eds. O. P. John, R. W. Robins and L. A. Pervin (New York: Guilford Press), 114–158.

Jung, T., and Wickrama, K. A. S. (2008). An introduction to latent class growth analysis and growth mixture modeling. *Soc. Personal. Psychol. Compass* 2, 302–317. doi: 10.1111/j.1751-9004.2007.00054.x

Kankaraš, M., and Suarez-Alvarez, J. (2019). "Assessment framework of the OECD study on social and emotional skills" in *OECD education working papers*, No. 207 (Paris: OECD Publishing)

Katz, I., Cohen, R., Green-Cohen, M., and Morsiano-Davidpur, S. (2018). Parental support for adolescents' autonomy while making a first career decision. *Learn. Individ. Differ.* 65, 12–19. doi: 10.1016/j.lindif.2018.05.006

Kenny, M., and Medvide, M. B. (2013). "Relational influences on career development" in *Career development and counseling: putting theory and research to work*. eds. S. D. Brown and R. W. Lent (New Jersey: Wiley), 329–356.

Kidd, J. M. (2004). Emotion in career contexts: challenges for theory and research. *J. Vocat. Behav.* 64, 441–454. doi: 10.1016/j.jvb.2003.12.009

Lent, R. W., Brown, S. D., and Hackett, G. (2002). "Social cognitive theory" in *Career choice and development*. eds. D. Brown and Associates (New York: John Wiley & Sons, Inc), 255–311.

Li, Y., Guan, Y., Wang, F., Zhou, X., Guo, K., Jiang, P., et al. (2015). Big-five personality and BIS/BAS traits as predictors of career exploration: the mediation role of career adaptability. *J. Vocat. Behav.* 89, 39–45. doi: 10.1016/j.jvb.2015.04.006

Malti, T., and Noam, G. G. (2016). Social-emotional development: from theory to practice. *Eur. J. Dev. Psychol.* 13, 652–665. doi: 10.1080/17405629.2016.1196178

Marôco, J. (2010). *Analise de Equações Estruturais: Fundamentos Teóricos, Software e Aplicações*. [Structural equations analysis: theoretical foundations, software, and applications]. ReportNumber, Lda.

Meyer, J. P., and Morin, A. J. S. (2016). A person-centered approach to commitment research: theory, research, and methodology. *J. Organ. Behav.* 37, 584–612. doi: 10.1002/job.2085

Mittal, S. (2021). Ability-based emotional intelligence and career adaptability: role in job- search success of university students. *High. Educ. Ski. Work-based Learn.* 11, 454–470. doi: 10.1108/HESWBL-10-2019-0145

Morin, A. J. S., Morizot, J., Boudrias, J.-S., and Madore, I. (2011). A multifoci person-centered perspective on workplace affective commitment: a latent profile/factor mixture analysis. *Organ. Res. Methods* 14, 58–90. doi: 10.1177/1094428109356476

Muthén, B. O. (2004). "Latent variable analysis: growth mixture modeling and related techniques for longitudinal data" in *Handbook of quantitative method- ology for the social sciences*. ed. D. Kaplan (California: Sage Publications), 345–368.

Nieto-Flores, M., Berrios, M. P., and Extremera, N. (2019). Job search self-efficacy as a mediator between emotional intelligence and the active job search process. *Int. J. Soci. Psychol.* 34, 86–109. doi: 10.1080/02134748.2018.1537652

Nylund, K. L., Asparouhov, T., and Muthén, B. O. (2007). Deciding on the number of classes in latent class analysis and growth mixture modeling: a Monte Carlo simulation study. *Struct. Equ. Model. Multidiscip. J.* 14, 535–569. doi: 10.1080/10705510701575396

OECD (2015). *Skills for social Progress. The power of social and emotional skills*. Paris: OECD Publishing.

OECD (2021b). *OECD survey on social and emotional skills: technical report*. Paris: OECD Publishing.

OECD (2021a). *Beyond academic learning: first results from the survey of social and emotional skills*. Paris: OECD Publishing.

Paixão, O., and Gamboa, V. (2017). Motivational profiles and career decision making of high school students. *Career Dev. Q.* 65, 207–221. doi: 10.1002/cdq.12093

Paixão, O., and Gamboa, V. (2022). Autonomous versus controlled motivation on career indecision: the mediating effect of career exploration. *J. Career Dev.* 49, 802–815. doi: 10.1177/0894845321992544

Parmentier, M., Pirsoul, T., and Nils, F. (2019). Examining the impact of emotional intelligence on career adaptability: a two-wave cross-lagged study. *Personal. Individ. Differ.* 151:109446. doi: 10.1016/j.paid.2019.05.052

Parmentier, M., Pirsoul, T., and Nils, F. (2022). Career adaptability profiles and their relations with emotional and decision-making correlates among Belgian undergraduate students. *J. Career Dev.* 49, 934–950. doi: 10.1177/0894845321100555 3

Pirsoul, T., Parmentier, M., and Nils, F. (2022). Emotional intelligence profiles and job search correlates in the context of the school-to-work transition. *J. Career Dev.*:089484532211414. doi: 10.1177/08948453221141445

Pulido-Martos, M., Cortés-Denia, D., Ghoudani, K., Luque-Reque, O., and Lopez-Zafra, E. (2022). Socioemotional resources and mental health in Moroccan adolescents: a person- centered approach. *Front. Psychol.* 13:830987. doi: 10.3389/fpsyg.2022.830987

Roberts, C. M., Kane, R. T., Rooney, R. M., Pintabone, Y., Baughman, N., Hassan, S., et al. (2018). Efficacy of the Aussie optimism program: promoting pro-social behavior and preventing suicidality in primary school students a randomised-controlled trial. *Front. Psychol.* 8:1392. doi: 10.3389/fpsyg.2017.01392

Ryan, R. M., and Deci, E. L. (2000). Intrinsic and extrinsic motivations: classic definitions and new directions. *Contemp. Educ. Psychol.* 25, 54–67. doi: 10.1006/ceps.1999.1020

Salmela-Aro, K., and Upadyadya, K. (2020). School engagement and school burnout profiles during high school–the role of socio-emotional skills. *Eur. J. Dev. Psychol.* 17, 943–964. doi: 10.1080/17405629.2020.1785860

Santos, A., Wang, W., and Lewis, J. (2018). Emotional intelligence and career decision-making difficulties: the mediating role of career decision self-efficacy. *J. Vocat. Behav.* 107, 295–309. doi: 10.1016/j.jvb.2018.05.008

Savickas, M. L. (2005). "The theory and practice of career construction" in *Career development and counseling: putting theory and research to work*. eds. S. D. Brown and R. W. Lent (Hoboken, New Jersey: John Wiley & Sons, Inc), 42–70.

Savickas, M. L. (2013). "Career construction theory and practice" in *Career development and counseling: putting theory and research to work*. eds. S. D. Brown and R. W. Lent. *2nd* ed (Hoboken: John Wiley & Sons, Inc), 147–183.

Schoon, I. (2021). Towards an integrative taxonomy of social-emotional competences. *Front. Psychol.* 12:515513. doi: 10.3389/fpsyg.2021.515313

Spurk, D., Hirschi, A., Wang, M., Valero, D., and Kauffeld, S. (2020). Latent profile analysis: a review and "how to" guide of its application within vocational behavior research. *J. Vocat. Behav.* 120:103445. doi: 10.1016/j.jvb.2020.103445

Stumpf, S., Colarelli, S., and Hartman, K. (1983). Development of the career exploration survey (CES). *J. Vocat. Behav.* 22, 191–226. doi: 10.1016/00018791(83)90028-3

Sudkamp, A., Praetorious, A., and Spinath, B. (2017). Teachers' judgment accuracy concerning consistent and inconsistent student profiles. *Teach. Teach. Educ.* 76, 204–213. doi: 10.1016/j.tate.2017.09.016

Taveira, M. C. (1997). *Exploração e desenvolvimento vocacional de jovens: Estudo sobre as relações entre a exploração, a identidade e a indecisão vocacional*. [Unpublished doctoral dissertation], Universidade do Minho, Portugal.

Turan, E., Çelik, E., and Turan, M. E. (2014). Perceived social support as predictors of adolescents' career exploration. *Aust. J. Career Dev.* 23, 119–124. doi: 10.1177/1038416214535109

Turner, S. L., Alliman-Brissett, A., Lapan, R. T., Udipi, S., and Ergun, D. (2003). The career- related parent support scale. *Meas. Eval. Couns. Dev.* 36, 83–94. doi: 10.1080/07481756.2003.12069084

Vondracek, F. W., Lerner, R. M., and Schulenberg, J. E. (1986). *Career development: a lifespan contextual approach to career development*. Hillsdale: Erlbaum.

Wang, M., and Hanges, P. J. (2011). Latent class procedures: applications to organizational research. *Organ. Res. Methods* 14, 24–31. doi: 10.1177/1094428110383988

Weissberg, R. P., Durlak, J. A., Domitrovich, C. E., and Gullotta, T. P. (2015). "Social and emotional learning: past, present, and future" in *Handbook of social and emotional learning: research and practice*. eds. J. A. Durlak, C. E. Domitrovich, R. P. Weissberg and T. P. Gullotta (New York: The Guilford Press), 3–19.

Whiston, S. C., and Keller, B. K. (2004). The influences of the family of origin on career development: a review and analysis. *Couns. Psychol.* 32, 493–568. doi: 10.1177/0011000004265660

Wilkins, B., Boman, P., and Mergler, A. (2015). Positive psychological strengths and school engagement in primary school children. *Cogent Educ.* 2:1095680. doi: 10.1080/2331186X.2015.1095680

Young, R. A., Paseluikho, M. A., and Valach, L. (1997). The role of emotion in the construction of career in parent-adolescent conversations. *J. Couns. Dev.* 76, 36–44. doi: 10.1002/j.1556-6676.1997.tb02374.x

Young, R. A., Valach, L., and Collin, A. (1996). "A contextualist explanation of career" in *Career choice and development*. eds. D. Brown, L. Brooks and M. J. Lynam. *3rd* ed (San Francisco: Jossey-Bass), 477–512.

Zyphur, M. J. (2009). When mindsets collide: switching analytical mindsets to advance organization research. *Acad. Manag. Rev.* 34, 677–688. doi: 10.5465/amr.34.4.zok677

frontiers | Frontiers in Psychology

TYPE Original Research
PUBLISHED 21 August 2023
DOI 10.3389/fpsyg.2023.1214032

OPEN ACCESS

EDITED BY
Pedro Rosário,
University of Minho, Portugal

REVIEWED BY
Juliana Martins,
University of Minho, Portugal
Guida Veiga,
University of Évora, Portugal

*CORRESPONDENCE
Catarina Castro
✉ cacco11@iscte-iul.pt

RECEIVED 28 April 2023
ACCEPTED 04 August 2023
PUBLISHED 21 August 2023

CITATION
Castro C, Barata C, Alexandre J and Colaço C (2023) Validation of a community-based application of the Portuguese version of the survey on Social and Emotional Skills – Child/Youth Form.
Front. Psychol. 14:1214032.
doi: 10.3389/fpsyg.2023.1214032

Validation of a community-based application of the Portuguese version of the survey on Social and Emotional Skills – Child/Youth Form

Catarina Castro[1]*, Clara Barata[2], Joana Alexandre[1] and Carla Colaço[1]

[1]Department of Psychology, Center for Psychological Research and Social Intervention – CIS-IUL, ISCTE – University Institute of Lisbon, Lisbon, Portugal, [2]Institute of Interdisciplinary Research, Center of Interdisciplinary Studies (CEIS20), University of Coimbra, Coimbra, Portugal

Introduction: Children and adolescents' social and emotional skills have been gaining attention in diverse settings. With over 100 conceptual frameworks available, there is now a common move toward framing these skills as social and emotional learning (SEL), assuming that they are not only amiable to development, but also malleable to change as a product of intervention. As such, there is a strong need for a comprehensive measure to effectively evaluate such skills, validated for different age groups in children and young people, and applicable to both educational contexts and community settings.

Methods: This paper presents the validation of the Portuguese adaptation of the Child/Youth form of the Survey on Social and Emotional Skills (SSES), in the scope of the Gulbenkian Academies for Knowledge initiative with a sample of 7,831 participants between 8 and 17 years old ($M = 11.79$, $SD = 2.94$).

Results: Results show that the measure has good internal consistency and sensitivity, while also being sensitive to change over time. Preliminary factor analysis shows promise, although further research is necessary.

Discussion: Discussion reflects on the value of the Child/Youth form of the SSES as a comprehensive measure to be used by community and educational professionals to monitor skill development and improve their work on SEL.

KEYWORDS

adolescents, children, measures, social and emotional skills, social emotional learning, validation

Introduction

Social and emotional skills are a multidimensional construct that encompasses a set of intrapersonal competencies, important for the overall functioning of individuals, and interpersonal ones, essential for successfully interacting with others (Domitrovich et al., 2017).

Social–emotional learning (commonly referred to as SEL) is the process by which social and emotional skills are developed. According to Weissberg et al. (2015), it is through this process that knowledge, attitudes, and abilities are acquired, which are fundamental to managing emotions, achieving a set of goals, feeling and showing empathy for others, establishing and maintaining interpersonal relationships, and making responsible decisions.

Children and adolescents' social and emotional skills have been gaining attention in diverse settings, including educational contexts and community settings. The importance of these skills is now also changing policy. For example, these skills have recently been included in the educational reference that guides education policies in Portugal – the Profile of Students Leaving Compulsory School (Martins et al., 2017).

The need for reliable and valid measurements of social and emotional skills is of crucial importance for evaluating SEL interventions. As Duckworth and Yeager (2015) state, measurement matters for many reasons: from a practical standpoint, changing certain competencies is easier when we can measure them, so data is important to inform action. Measurement also helps to inform progress monitoring, and to effectively evaluate SEL programs (Brush et al., 2022). For instance, the *Data Wise* model (Boudett et al., 2013) is an eight-step model that guides educational teams to improve teaching and learning by performing evidence-based analyses, motivating them to apply and systematize practices with the aim of articulating intervention and evaluation prior to implementation, and restructuring the intervention after its conclusion, based on collected data (Boudett et al., 2013).

However, there is great variability in available measures for social and emotional skill assessment, particularly in terms of the behavior they capture, the uniqueness of its constructs (as opposed to some degree of theoretical overlapping), in how comprehensive they are (measuring one single skill versus several dimensions and skills), the respondents they engage with (children, youth, parents, teachers) and format of response (questionnaires, observation measures, tasks; Humphrey et al., 2011). More importantly, SEL assessments tend to "vary greatly depending on the theoretical frameworks that underlie them" (Murano et al., 2021, p. 1).

This variability leads to diverse approaches, and often conceptual confusion, regarding how these skills are defined, how they translate to observable behavior and, consequently, how they are measured, leading most available instruments to be highly specific for the evaluation of a given intervention, or the measurement of a given skill (Martinez-Yarza et al., 2023). In a systematic review by Humphrey et al. (2011), 12 instruments for measuring SEL were found. The authors concluded that many of these measures were not being extensively used and disseminated, and were unevenly distributed across the targeted skills, for example, emotional skills were less evaluated than social skills. The authors also argued that most measures had only been validated for the United States and the United Kingdom, and only for non-diverse groups of children (Humphrey et al., 2011).

More recently, with the increased popularity of social and emotional learning approaches, a systematic review by Martinez-Yarza et al. (2023) identified 25 measures developed over a 20-year period, covering elementary through secondary education, usually targeting some SEL dimensions but not all of them. This review also shows that the most frequently used assessment method was indirect assessment relying mainly on Likert scales, suggesting there is the need for validating brief and user-friendly measurement measures, as well as for using a combination of multi-method and multi-informant assessment to effectively assess these skills (Martinez-Yarza et al., 2023). SEL measures also need to capture the dynamic interaction between individuals and their environment and context (Brush et al., 2022).

The study on social and emotional skills

Recognizing the central role of SEL at a young age for a healthy and successful adjustment throughout life, the Organization for Economic Cooperation and Development (OECD) developed the Study on Social and Emotional Skills (SSES). The development of the study was underlined by an effort to consolidate and disambiguate knowledge about how SEL skills develop in children and youth, and what aspects of children's daily settings – family, school, community – promote or hinder this development.

The OECD's Study on Social and Emotional Skills (and, subsequently, its survey) was framed under the Big Five model, following one of the most common frameworks for personality and skills. However, also following recent trends in the literature, it understands these skills as malleable, learnable and context dependent, as opposed to fixed traits of personality (Kankaraš and Suarez-Alvarez, 2019). The Big Five structure aims to provide a "general outline of how these skills are organized" (Chernyshenko et al., 2018, p. 9), since this five factor structure has been commonly found in personality and skills research in different cultures and settings (e.g., McCrae and Costa, 1997), including for children and young people (e.g., Tackett et al., 2012), and correlates highly with several outcomes throughout life (such as wellbeing, academic and professional success, or physical health; Chernyshenko et al., 2018).

Following a thorough review, the OECD opted for this Big Five structure to guide its approach to social and emotional skills, organizing its study in five dimensions: *Collaboration*, *Task Performance*, *Emotional Regulation*, *Engagement with Others*, *Open-mindedness*. These relate, respectively, with the classic Big Five domains of *Agreeableness*, *Conscientiousness*, *Neuroticism*, *Extraversion*, and *Openness to Experience*. Each dimension then encompasses several individual skills, which are the focus of the SSES.

Collaboration is understood as the ability to have sympathy toward others and express altruism, leading to better quality relationships and more pro-social behaviors; it includes the individual skills of *Empathy*, *Trust*, and *Cooperation*. *Task performance* relates to being self-disciplined and persistent, with a tendency to stay on task and to be a high achiever; it includes the individual skills of *Responsibility*, *Self-control*, and *Persistence*. *Emotional regulation* refers to what allows an individual to effectively manage negative emotional experiences and stressors, and it includes the skills of *Stress resistance*, *Optimism*, and *Emotional control*. *Engagement with others* refers to those who are extraverted, energetic, positive, and assertive, having an ease to establish social connections; it includes the skills of *Sociability*, *Assertiveness*, and *Energy*. Lastly, *Open-mindedness* stands as the will to accommodate different perspectives and new experiences, and includes the individual skills of *Curiosity*, *Tolerance* and *Creativity* (OECD, 2021).

As a product of the study, a comprehensive measure was developed, the Survey on Social and Emotional Skills, and was administered to over 60,000 participants of 10 and 15 years of age in 10 cities around the world, collecting data on 15 different social and emotional skills, as well as on sociodemographic, family, school, and community contextual characteristics, with data on students' skills being reported by students, families, and teachers. SSES was implemented as the first large-scale international survey of SEL

(OECD, 2021). Portugal was represented in this study by the Municipality of Sintra, contributing with over 3,000 participants, and thus constituting the sample for the initial Portuguese adaptation of this instrument.

This study, and the resulting survey, stand as a valuable effort to develop a comprehensive measure to the assessment of a broad array of social and emotional skills. The concern for the predictive value of the selected skills, the suitability of a Big Five approach to skills across different cultures and ages, and the comprehensive nature of the questionnaire support its suitability to measure these social and emotional skills, allowing for researchers and practitioners to further delve into the evidence-based promotion and evaluation of SEL.

Gulbenkian Academies for Knowledge

In 2018, the Portuguese Calouste Gulbenkian Foundation set out to implement a central mechanism for the development and support of innovative solutions for complex societal problems. In order to do so, the Foundation offered to co-fund intervention approaches to SEL, named Gulbenkian Academies for Knowledge (henceforth referred to as Academies), which could include a broad array of domains such as educational, science learning, health, civic participation, among others, under the common umbrella of developing social and emotional competencies of children and youth 0 to 25 years of age across the country. Between 2018 and 2022, the Foundation opened three rounds of applications (2018, 2019, 2020) in order to select 100 community-or school-based projects. Each project could be implemented across 1, 2 or 3 years. Because some Academies chose to test their intervention only in their second year of funding, there were in total 4 cohorts of Academies, across four school years.

To achieve the goal of promoting these skills, 35 Academies chose to implement intervention approaches previously validated using experimental or quasi-experimental evidence, and proven results (such as the *Incredible Years* Program), while the remaining 65 chose to develop and implement pilot approaches, i.e., innovative interventions, designed by each Academy, with the potential to be rigorously evaluated and validated as an effective intervention ($N = 65$). By integrating the GAK initiative, each Academy also committed to the implementation monitoring (Durlak and DuPre, 2008) and the experimental or quasi-experimental impact evaluation of its intervention, with the aim of contributing to the production of knowledge, and the dissemination of evidence-based interventions, without compromising the quality criteria necessary to these processes. All Academies were also recommended to involved at least 100 participants in their impact evaluation, in order to ensure some statistical power in their impact evaluation. Although this was not mandatory, it was strongly recommended, and most of the projects complied to this rule.

In addition to co-funding the intervention, the Foundation offered 100 selected programs the technical support of a Monitoring and Evaluation Team, which assisted Academies in all stages of their evaluation processes, including the development of their Theory of Change, closely monitoring various dimensions of program implementation, and designing experimental, quasi-experimental or descriptive impact evaluation studies, with standardized measures of intervention and control/comparison groups at pre-test and post-test. The M&E Team also provided continuous support and training opportunities to all Academies throughout the initiative. The training model, based on the *Data Wise* model (Boudett et al., 2005), focused on aspects related to monitoring (how to design a Theory of Change, how to observe program implementation, how to use program implementation monitoring data to improve interventions), impact evaluation (how to conceptually align intervention and evaluation, how to select evaluation measures, how to constitute intervention and control groups, how to analyze and discuss results), and ethical aspects inherent to research in the field. The M&E Team did so by providing training sessions, frequent individual consultancy, and visiting the Academies.

Of central importance to this study, is that the Foundation required the use of the SSES as a common metric of impact measurement across Academies. This means Academies were required to use SSES for pre-and post-test assessment of all participants in their evaluation. Because theories of change across Academies varied greatly, and the Foundation wanted to fund intervention approaches with a clear goal, Academies could choose a minimum of two SSES competencies to monitor across evaluation stages. Moreover, no items from the Energy subscale could be used because this skill was not aligned with the theoretical scope of the Foundation work. Academies could complement their evaluation work with other standardized measures of assessment.

The present study

This study aimed to examine the psychometric properties of the Portuguese version of the Child/Youth Form of the Survey on Social and Emotional Skills (SSES; OECD, 2021) used within the Gulbenkian Academies for Knowledge initiative with a large Portuguese community sample. Specifically, we aimed to: (1) to test the internal consistency of the SSES – Child/Youth Form, by analyzing its internal consistency; (2) to test the scale's sensitivity to changes in participants' social and emotional skills between pre-test and post-test; and (3) to explore the factor structure of the SSES – Child/Youth Form.

Method

Sample

The study sample included participants from 43 Academies, 5 from validated approaches and 38 from pilot approaches. The requirement to use the SSES as a common impact measure was implemented starting in the second cohort of Academies, because SSES was not available prior. However, due to the low quality and quantity of data from the 2nd edition (2019–2020), which was severely impacted by the outburst of the COVID-19 pandemic midyear, data from these 43 Academies which implemented the SSES Child/Youth Form comes from the third and fourth cohort only (2020–2021 and 2021–2022, respectively). Academies which chose not to administer the SSES in any of its forms, or that only administered its Parent or Teacher Forms, have also been excluded from the present study. Finally, only participants between the ages

10.3389/fpsyg.2023.1214032

TABLE 1 Participants' sociodemographic characteristics.

	N	M	SD	Min	Max	Skewness	Kurtosis
Child/Youth							
Age	7,831	11.79	2.94	8	17	0.307	−1.375
School grade	7,676	6.15	2.85	1	13	0.336	−1.309
Child is female	7,831	0.52	0.50	0	1	−0.095	−1.991
Child has special educational needs	4,307	0.07	0.25	0	1	3.418	9.686
Child is Portuguese	7,831	0.74	0.44	0	1	−1.114	−0.760
Child attends a public school	6,677	0.91	0.28	0	1	−2.928	6.574
Child has been held back a school year	5,300	0.14	0.35	0	1	2.058	2.235
Parents							
Mom is Portuguese	4,498	0.57	0.49	0	1	−0.301	−1.910
Mom's age	5,267	41.61	6.19	18	83	0.003	0.455
Mom's education	6,110	3.95	1.14	0	6	−0.898	0.321
Mom works	5,349	0.80	0.40	0	1	−1.513	0.290
Mom is married	4,183	0.73	0.44	0	1	−1.056	−0.885
Dad is Portuguese	4,207	0.54	0.50	0	1	−0.149	−1.978
Dad's age	4,649	44.13	6.89	23	76	0.274	0.652
Dad's education	5,656	3.69	1.21	0	6	−0.617	−0.373
Dad works	4,872	0.91	0.29	0	1	−2.838	6.056
Dad is married	3,986	0.76	0.42	0	1	−1.245	−0.450
Family							
Family benefits from social assistance	3,509	0.19	0.39	0	1	1.573	0.476
Child has siblings	4,705	0.81	0.40	0	1	−1.551	0.406
Number of siblings	4,705	1.27	1.17	0	27	5.028	77.042
Child lives with at least one parent	5,507	0.95	0.22	0	1	−3.991	13.929
Child lives in an urban setting	3,812	0.84	0.36	0	1	−1.880	1.534

of 8 and 17 years old were included in this study sample, aiming for testing the validity of this instrument for participants 2 years older and 2 years younger than the participants in both cohorts from the original OECD study (10-and 15-year-old cohorts).

This means inclusion criteria for participants in this study comprised all participants from the two final cohort years of the Gulbenkian Academies for Knowledge initiative between the ages of 8 and 17 years old, with available information on age and sex, as well as with responses on SSES – Child/Youth Form either at pre-test or at post-test. This sample comprises 7,831 participants, 52% of which were female, and with ages ranging from 8 to 17 years old ($M = 11.79$, SD = 2.94). Mean school grade was the 6th grade ($M = 6.15$, SD = 2.85), and the majority of participants (74%) were Portuguese. As for family characteristics, both parents were predominantly Portuguese (85% of mothers and 86% of fathers), and their highest educational level was, on average, high school, although mothers scored higher (mother's educational level $M = 3.95$, SD = 1.14, father's educational level $M = 3.69$, SD = 1.21[1]). Most families lived in an urban setting (84%), with a fifth (19%) benefitting from some form of social assistance by social security services (Table 1).

Measure

The SSES – Child/Youth form (OECD, 2021) is a self-report instrument composed of 120 items, answered in a scale of one (Totally disagree) to five (Totally agree), which allows the assessment of a set of

1 Scores were obtained by categories related to the Portuguese schooling system: 0=Cannot read or write; 1=up to the 4th grade, 2=up to the 6th grade, 3=up to the 9th grade, 4=up to the 12th grade, 5=university degree.

15 social and emotional skills by child or youth participants aged between eight and 17 years old. It includes the following 15 subscales, with eight items each: Optimism (OPT; "I look at the bright side of life"), Responsibility (RES; "I am a responsible person"), Curiosity (CUR; "I like learning new things"), Self-control (SEL; "I stop to think before acting"), Emotional control (EMO; "I stay calm even in tense situations"), Cooperation (COO; "I get along well with others"), Sociability (SOC; "I make friends easily"), Assertiveness (ASS; "I enjoy leading others"), Creativity (CRE; "I have a good imagination"), Resilience/Stress resistance (STR; "I am relaxed and handle stress well"), Persistence/Perseverance (PER; "I make sure that I finish tasks"), Empathy (EMP; "I know how to comfort others"), Tolerance (TOL; "I like hearing about other cultures and religions"), Trust (TRU; "I believe most people are kind") and Energy (ENE; "I am full of energy"). The survey could be administered in paper format or online format. Data from the global sample of SSES's main study by OECD (2021) indicates Cronbach's alpha's internal consistency levels between 0.71 (Empathy) and 0.85 (Assertiveness).

Procedures

Data collection

Data was collected directly by each Academy's team with their participants, having selected the appropriate mechanisms to the specific needs of its setting and sample. However, Academies adopted common data collection and management procedures, as well as ethical procedures, and were closely monitored by the Monitoring and Evaluation team. Therefore, all Academies were required, prior to assessment, to collect informed consent from each participant's legal tutor, prepare data collection materials (paper versions or online versions of each measure), and prepare adequate locations (e.g., classrooms, community facilities).

Since each Academy would select the SSES subscales that best aligned with their Theory of Change, i.e., that evaluated the social and emotional skills targeted by their intervention, there is great variability in sample size for each subscale. Additionally, regarding pre-test and post-test scores, there is a decrease in sample size across subscales due to missing data: respondents may only have participated in one of the data collection moments, with participant mortality being common at post-test.

Data collection procedures could be managed and implemented by any adequately trained member of the Academy's team, including teachers, social and youth workers, psychologists, researchers, among others, with supervision. In some instances (particularly with adult participants and/or with the comparison or control groups), the materials were provided, and the participant responded autonomously to the measures. Data was then submitted by the Academies to the M&E Team for cleaning and analysis.

Regarding ethical procedures, aside from the aforementioned written informed consent collected from legal tutors, all Academies were instructed to collect oral assent prior to assessment, and debrief underaged participants of study goals and procedures. Moreover, all data collection and analysis procedures ensured confidentiality, with each participant being granted an ID by their Academy's team, meaning all data was fully anonymous to members external to the Academy, including the monitoring and evaluation team. The M&E team also granted regular ethics and data protection awareness training sessions to all Academies, and provide countless session of mentoring. All Academies whose data is included in this paper granted their approval for it to be processed and published for this purpose by the M&E Team via signed informed consent.

Data analysis

To test the scale's internal consistency, we calculated Cronbach's alpha for each subscale and for the overall score. We also observed central tendency measures (i.e., mean), dispersion measures (i.e., standard deviation), and the normality of variables was verified by analyzing asymmetry (skewness) and tailedness (Kurtosis) for each item. To test sensitivity to change over time, we conducted a *t*-test for differences between paired samples to analyze differences in scores between pre-test and post-test at the subscale level and in overall score. Effect sizes and correlations between pre-test and post-test measures were also calculated; Cohen's *d* measure of standardized mean difference was calculated to attest the effect size on all subscales, whereas correlations between pre-test and post-test aimed to assume that scores from both data collection points positively relate to each other. Finally, a preliminary exploratory factor analysis (EFA) was conducted to explore the factor structure of the SSES – Child/Youth Form. Following (Smith-Donald et al., 2007), we used principal component extraction for the 112-item version of the Child/Youth Form of the SSES, i.e., the original 120-item version, excluding the 8 items from the *Energy* subscale. After confirming the suitability of the data via the Kaiser-Meyer-Olkin (Hutcheson and Sofroniou, 1999) test and Bartlett's test of sphericity (Dziuban and Shirkey, 1974), a preliminary exploratory factor analysis was conducted with the 112 items to explore the factor structure of the SSES – Child/Youth Form. Resulting components were rotated obliquely using Promax to allow correlation between factors. Cronbach's alpha was calculated for each emerging construct and provides an index of internal consistency based on the average of the items scores in the construct. We used IBM SPSS, Version 28.0 for the analyses.

Results

Internal consistency of the SSES – Portuguese Child/Youth form

Table 2 shows Cronbach's alpha for each subscale, and correlations between subscales and overall score for the SSES – Portuguese Child/Youth Form at pre-test. Internal consistency levels were overall good, ranging from 0.697 (Empathy) to 0.903 (Persistence/perseverance), while the overall scale showed an excellent level of internal consistency ($\alpha = 0.951$). Moderate to high correlations were found for 12 subscales, ranging between 0.627 (Tolerance) and 0.881 (Persistence/Perseverance). Only two subscales (Assertiveness, $r = 0.403$; and Resilience/Stress Resistance, $r = 0.480$) show low yet significant correlations with the overall scale.

Sensitivity of the SSES

Descriptive statistics and overall score

Supplementary Table 1 presents descriptive information for the items, subscales, and overall score for the SSES – Child/Youth Form at pre-test.

TABLE 2 Cronbach's alpha, correlations and overall score for SSES – Child/Youth form.

	Number of items	Alpha	Correlation with overall score
Curiosity	8	0.781	0.712**
Responsibility	8	0.856	0.865**
Optimism	8	0.835	0.673**
Emotional control	8	0.725	0.695**
Self-control	8	0.867	0.867**
Assertiveness	8	0.881	0.403**
Cooperation	8	0.783	0.731**
Sociability	8	0.759	0.678**
Creativity	8	0.740	0.629**
Persistence/Perseverance	8	0.903	0.881**
Resilience/Stress resistance	8	0.826	0.480**
Empathy	8	0.697	0.665**
Tolerance	8	0.760	0.627**
Trust	8	0.819	0.651**
SSES Child/Youth Form – overall score	112	0.951	

**$p < 0.001$.

Overall mean results at pre-test ranged between $M = 1.96$ (SD = 1.09, Resilience Item 3) and $M = 4.61$ (SD = 0.65, Sociability Item 3) at the item level (overall score $M = 3.49$, SD = 0.67), and at the subscale level between $M = 2.67$ (SD = 0.89, Assertiveness) and $M = 4.15$ (SD = 0.53, Cooperation). All items were scored between one and five, with 96 items (85.7% of total) average scoring above the scale's median. Kurtosis and skewness values for most items presented data skewed to the right and mostly peaked, suggesting a concentration of scores toward the higher end of the scale for most subscales.

Sensitivity of the SSES to change over time

Table 3 illustrates differences in SSES – Portuguese Child/Youth Form scores between pre-test and post-test. As shown previously in Supplementary Table 1, overall score at pre-test was $M = 3.49$ (SD = 0.67), with subscale mean scores ranging from $M = 2.67$ (SD = 0.89, Assertiveness) to $M = 4.15$ (SD = 0.53, Cooperation). At post-test, no subscales showed a statistically significant higher mean score than at pre-test, whereas seven subscales showed statistically significant differences in the opposite direction (i.e., with participants scoring higher at pre-test): *Curiosity*, *Responsibility*, *Optimism*, *Self-control*, *Cooperation*, *Sociability*, and *Trust*. This is also true for differences between overall scale scores, with a statistically significant decrease in the score between pre-test and post-test. This indicates that participants self-assessed their social and emotional skills higher (and scoring highly in the 5-point scale) at pre-test, before receiving any intervention. Effect sizes ranged between −0.038 (Tolerance) and 0.290 (Responsibility and Resilience/Stress Resistance) at the subscale level. Correlations between scores at pre-test and post-test were moderate and significant for most subscales, as well as for the overall scale, with correlations ranging from 0.606 (*Emotional Control*) to 0.727 (*Sociability*). Exceptions were found for the subscales *Responsibility* ($r = 0.440$), *Empathy* ($r = 0.565$), *Creativity* ($r = 0.590$), and *Self-control* ($r = 0.599$), although all are statistically significant.

Validity of the SSES

Factor structure of the SSES – Child/Youth form

Initial Kaiser-Meyer-Olkin test (KMO = 0.855) and Bartlett sphericity test (Bartlett, χ^2 (6216) = 21,893,901, $p < 0.001$) confirmed the adequacy of data to perform a factor analysis (Pasquili, 1999; Tabachnick and Fidell, 2007). Initial confirmatory factor analysis on the 112 items of the SSES – Child/Youth form indicated 25 components with eigenvalue >1 (Kaiser rule), accounting for 69.43% of variance explained. However, not only was this structure difficult to interpret given the underlying theoretical framework, but also most of the components' variance weights were too low (e.g., <2%). Since we were using data pertaining to only 14 of the 15 original subscales, we chose not to force the extraction of a fixed number of factors drawn from the original instrument. Thus, we then forced the extraction of 10 components – due to it cumulatively accounting for over 50% of total variance explained (e.g.: Marôco, 2018). In the newly obtained factorial structure, one item (*Curiosity* – item 6) did not load onto any component (with a value over 0.32; Tabachnick and Fidell, 2007). For items loading in more than one component, we opted to maintain them where the load was higher, as long as the difference in scores was above 0.2 (Pereira and Patrício, 2008). However, that difference was inferior to 0.2 in 14 items, which led to their exclusion. Excluded items belong to the subscales *Cooperation* (items 2 and 4), *Creativity* (item 6), *Emotional control* (items 2 and 6), *Empathy* (items 3 and 6), *Optimism* (item 1), *Responsibility* (item 5), *Self-control* (item 8), and Sociability (items 2, 3, 5 and 6).Factor analysis was then redone under the same rules, including a final version of 98 items loading into 10 components. This final structure explained 52.38% of total variance, and 69.1% of items presented good to excellent loads (i.e., >0.5; Comrey and Lee, 1992). Four items (*Curiosity* – item 4, *Cooperation* – item 3, *Sociability* – item 4, and *Empathy* – item 5) did not load onto any factor. Table 4 summarily presents the final

10.3389/fpsyg.2023.1214032

TABLE 3 Differences between pre-test and post-test scores for SSES – Child/Youth form's subscales.

Subscale	*N*	Mean Diff.	SD	*t*	*df*	*p*	Effect size	Correlation between pre-test and post-test
Curiosity	1,837	0.049	0.505	4.164	1,836	0.000	0.097	0.649**
Responsibility	1,533	0.205	0.706	11.373	1,532	0.000	0.290	0.440**
Optimism	1,744	0.135	0.621	9.070	1,743	0.000	0.217	0.635**
Emotional control	1,796	−0.024	0.659	−1.526	1,795	0.127	−0.036	0.606**
Self-control	1,771	0.038	0.603	2.678	1,770	0.007	0.064	0.599**
Assertiveness	2,440	0.014	0.674	0.989	2,439	0.323	0.020	0.723**
Cooperation	3,170	0.038	0.463	4.559	3,169	0.000	0.081	0.642**
Sociability	2,718	0.086	0.507	8.795	2,717	0.000	0.169	0.727**
Creativity	1,862	0.005	0.582	0.395	1,861	0.693	0.009	0.590**
Persistence/ Perseverance	1,590	−0.003	0.572	−0.211	1,589	0.833	−0.025	0.624**
Resilience/Stress resistance	1,591	−0.018	0.636	−1.113	1,590	0.266	0.290	0.704**
Empathy	3,766	−0.005	0.540	−0.561	3,765	0.575	−0.009	0.565**
Tolerance	2,585	−0.021	0.540	−1.936	2,584	0.053	−0.038	0.621**
Trust	2,731	0.078	0.582	6.985	2,730	0.000	0.134	0.689**
Overall score	4,853	0.026	0.400	4.498	4,852	0.000	0.065	0.672**

Negative mean differences indicate the score is higher at post-test. **$p < 0.001$.

structure of 10 components, and the corresponding load of the 94 items to its main component, whereas Supplementary Table 2 provides the detailed results of this analysis, with all items' loads to all components. The final 10 components were named as follows: Component 1 – "Perseverance and Responsibility," since it includes being persistent, responsible and able to control task related behavior (with items pertaining to the original *Persistence/Perseverance* – 8 items, and *Responsibility* – 5 items subscales); Component 2 – "Curiosity and Tolerance toward diversity" (since it includes all 8 items from the original *Tolerance* subscale, and 2 from *Curiosity*), relating to openness to different contexts and people; Component 3 – "Relations with others," which includes mostly items from the *Cooperation* (5 items) and *Empathy* (5 items) subscales, as well as one item from *Responsibility* subscales, all relating to one's ability to collaborate with others, and maintain positive relationships; Component 4 – "Emotional Control and Emotional Resilience," addressing the ability to manage and control emotions, particularly when facing distressful situations (with items from the original *Emotional control* – 6 items, *Resilience/Stress resistance* – 6 items, and *Self-control* – 1 items subscales); Component 5 – "Assertiveness/Leadership," which is composed of all 8 items from the original *Assertiveness* subscale; Component 6 – "Trust in others," which includes all 8 items from the original *Trust* subscale, relating to one's capacity to believe in other people's good intentions; Component 7 – "Social optimism," composed of the remaining 7 items from the original *Optimism* subscale, and three from *Sociability* subscale, relating to one's positive outlook on life and on starting and maintaining social relations, have friends and an active social life; Component 8 – "Care and concern for learning," which includes 6 items from the original *Self-control* subscale, 4 from *Curiosity* and two from *Resilience/Stress resistance*, related to one's eagerness to learn, emotional concern and care in performing tasks; Component 9 – "Creativity – Imagination," including 3 items from the original *Creativity* subscale and one from *Curiosity*, relating to the ability to fantasize and imagine new scenarios; and Component 10 – "Creativity – New solutions," which includes 4 items from the original *Creativity* subscale and one from *Responsibility*, related to the ability to come up with new ideas and original solutions.

Correlations between the final constructs and the overall scale were all significant except for component 10 related to *Creativity – New solutions* ($r = 0.094$), ranging between 0.352 (component 8 – *Care and concern for learning*) and 0.692 (component 1 – *Perseverance and Responsibility*). Internal consistency levels, as determined by Cronbach's alpha, were overall good, ranging between 0.677 and 0.926, except for the *Creativity – New solutions* component ($\alpha = 0.449$).

Discussion

This paper aimed to validate the Portuguese Child/Youth form of the Survey on Social and Emotional Skills (OECD, 2021) as a reliable, comprehensive self-report measure of a large set of social and emotional skills based on OECD approach to social emotional learning. Particularly, we did so with a large Portuguese sample, testing the measure in diverse community and educational settings, and with a heterogeneous set of participants in a national initiative

TABLE 4 Factorial structure for the SSES – Child/Youth form (summarized results).

Components									
1	2	3	4	5	6	7	8	9	10
I leave things unfinished* 0.848	I love to learn about other countries and cultures 0.780	I am reliable and can always be counted on 0.695	I get mad easily* 0.761	I like to be the leader of a group 0.916	I believe that my friends will never betray me 0.792	I look at the bright side of life 0.738	I like to make sure there are no mistakes 0.542	I have difficulty imagining things* 0.795	I sometimes find a solution other people do not see 0.455
I finish what I start 0.734	I like hearing about other cultures and religions 0.779	I am helpful and unselfish with others 0.689	I am relaxed and handle stress well 0.693	I enjoy leading others 0.873	I trust others 0.780	I wake up happy almost every day 0.688	I love learning new things in school 0.532	I find it difficult to create new things* 0.776	I sometimes behave irresponsibly* −0.440
I forget to do what I was asked to do* 0.655	I ask questions about other cultures 0.729	It is important to me that my friends are okay 0.688	I get nervous easily* 0.691	I want to be in charge 0.856	I believe that most people are honest 0.737	I am a happy person 0.684	I think carefully before doing something 0.531	I have little creativity* 0.628	I am original, I come up with new ideas 0.419
I keep working on a task until it is finished 0.645	I learn a lot from people with different beliefs 0.667	I am always willing to help my classmates 0.635	I often feel nervous* 0.682	I like to be a leader in my class 0.813	I believe that my friends can keep my secrets 0.686	I am always positive about the future 0.658	I stop to think before acting 0.517	I like to ask questions 0.369	I like to create things 0.410
I stop when work becomes too difficult* 0.624	I am not interested in other countries and cultures* 0.638	I treat others with respect 0.564	I know how to control my anger 0.668	I dislike leading a team* 0.809	I think most of my classmates can keep their promises 0.634	I enjoy life 0.637	I do not like learning* 0.465		I find new ways to do things 0.369
I often forget to do things I promised* 0.604	I am willing to be friends with people from other cultures 0.637	I am ready to help anybody 0.559	I stay calm even in tense situations 0.666	I am dominant, and act as a leader 0.790	I believe most people are kind 0.631	I believe good things will happen to me 0.543	I am eager to learn 0.461		
I give up easily* 0.603	I want to travel to other countries 0.601	I like to help others 0.532	I often feel angry* 0.626	I am a leader 0.530	I distrust people* 0.603	I am outgoing and social 0.477	I say the first thing that comes to my mind 0.460		
I hate leaving tasks unfinished 0.581	I feel comfortable in new cultural environments 0.565	I know how to comfort others 0.526	I am not easily upset 0.580	I know how to convince others to do what I want 0.493	I believe that other people will help me 0.577	I have difficulties making friends* 0.443	I like learning new things 0.447		
I make sure that I finish tasks 0.565	I am curious about many different things 0.528	I rarely ask others how they are feeling* 0.488	I panic easily* 0.556			I make friends easily 0.422	I am careful with what I say to others 0.418		

(Continued)

TABLE 4 (Continued)

Components									
1	2	3	4	5	6	7	8	9	10
I finish things despite difficulties in the way 0.557	I find science interesting 0.371	I am polite, courteous to others 0.466	I change my mood a lot* 0.479			I expect bad things to happen 0.417	I am often worried about something* −0.398		
I often forget my duties* 0.550		I am warm toward others 0.427	I am afraid of many things* 0.370				I avoid mistakes by working carefully 0.387		
I am a responsible person 0.492		I am reliable and can always be counted on 0.695	I can control my actions 0.365				I worry about many things* −0.361		
I avoid responsibilities* 0.407			I get scared easily* 0.351						

Rotation Method: Promax with Kaiser Normalization.
Components: 1. Perseverance and Responsibility; 2. Curiosity and Tolerance toward diversity; 3. Relations with others; 4. Emotional Control and Emotional Resilience; 5. Assertiveness/Leadership; 6. Trust in others; 7. Social optimism; 8. Care and concern for learning; 9. Creativity – Imagination; 10. Creativity – New solutions. *Reverse scored items.

aimed at supporting the implementation of social and emotional intervention programs – the Gulbenkian Academies for Knowledge. The large sample size and the representativeness of the sample stand as notable strengths in this study.

Internal consistency results were good for most subscales, and excellent for the overall scale, indicating a good internal consistency for this version of the scale. Correlations between each subscale and the overall score were moderate to high (except for the *Assertiveness* and *Resilience/Stress Resistance* subscales), indicating the different dimensions are bound by a common underlying construct related to social and emotional skills.

Descriptive results both at the item-level and subscale level indicate overall high scores at pre-test for most subscales, as well as for the overall scale. Mean scores are similar to those found by OECD in its original study (OECD, 2021), with the subscales *Cooperation* and *Curiosity* scoring the highest, and subscales *Assertiveness* and *Resilience/Stress Resistance* showing the lowest scores.

Results on the sensitivity of the measure to change over time show the SSES can be used to measure the impact of educational and community interventions focused on social and emotional skills for children and youth in a variety of settings in Portugal. The decrease in scores for most subscales found at post-test may relate to a phenomenon well documented in the literature, with participants perceiving themselves as less competent in terms of their social and emotional skills as a result of explicitly discussing them in interventions (Martinsone et al., 2022). As for the effect sizes found in testing differences between pre-test and post-test, several reviews on social and emotional learning have confirmed these programs tend to generate small effects sizes (e.g., Payton et al., 2008; Clarke et al., 2015; Tanner-Smith et al., 2018), leading to discuss the suitability of these commonly used standards (i.e., effects sizes) for attesting the efficacy of these interventions.

Self-report measures report typical behaviors, thoughts, and feelings (OECD, 2021). As Duckworth and colleagues (2015) point out, they are better suited than other types of measures for assessing internal psychological states. Such type of measure also promotes children's voices as they provide information about themselves (Gedikoglu, 2021).

Preliminary exploratory factor analysis results suggest a 94-items, 10-components structure for the Child/Youth Form of the SSES. Although some factors clearly maintain the structure from the subscales from the original study (e.g., *Assertiveness*, *Trust*), other seem to suggest the combination of two (or more) original subscales as a unified construct (such as *Perseverance* and *Responsibility* in component one), suggesting some shared meaning between how these skills are measured by the SSES. Additionally, some items did not load onto any factor, suggesting they may not share meaning with other items previously organized in the same subscale.

However, suggesting the usage of this 94-tem, 10 component structure is precocious. As previously stated, the SSES was tested in 10 different countries, with different social and cultural contexts, providing a cross-cultural comparability. Research has shown there is consensus regarding the main domains of social and emotional skills, their meaning, and how they translate to daily behavior across different cultures around the world (e.g., Chernyshenko et al., 2018), even though cultural incomparability would also be expected (OECD, 2021). Our results, which differ from the 15 subscales structure from the original SSES – Child/Youth form scale, can be due to cultural norms, values or references that provide different meanings to the same concepts (Jager et al., 2018). In the present study, variability in student characteristics within our sample may be a relevant factor. The original SSES study sample in Portugal was from the municipality of Sintra – a mostly urban, culturally diverse city in the greater Lisbon area –, meaning students

were likely to share similar community and school settings. In our study, however, a more diverse national sample was used (e.g., mostly rural versus mostly urban settings; high versus low rates of cultural diversity; diverse school and afterschool experiences), leading to the possibility of greater variability within the data. Although more research is needed on the factor structure of this measure, to provide further insight on the suitability of its structure, these results also shed some light on the fact that SEL interventions should have a culturally responsive approach (Hill, 2019).

Secondly, the larger age gap (and the larger number of participants below and above the ages of 10 and 15) may also impact the data, and the factorial structure found in this study. Indeed, research has shown that age is one of the most relevant individual characteristics to impact social and emotional skills, and that these skills develop at different rates, are understood, and translate into behavior differently for different ages (e.g., Denham et al., 2009). More research is necessary on the factor structure of this measure, in order to provide further insight on the suitability of its structure.

Limitations and recommendations for future research

Although representing an important step toward the use of the SSES as a practical measure of social and emotional skills for professionals, this work faces its limitations. Firstly, the heterogeneous sample (in terms of children/adolescent and family characteristics) may hinder the study of its psychometric properties, as it adds variability due to participants' characteristics. For instance, it would be beneficial if analysis were made for separate age groups, since we know these skills develop differently throughout childhood and adolescence (OECD, 2021), and may be understood differently by participants of different ages. Future research should explore the validity of this instrument for different age groups in a more detailed manner than in the present study or in the OECD's SSES report (OECD, 2021). Additionally, when addressing its applicability to different age groups, one of the instrument's limitations is its inadequacy for children under 8 years old, both due to literacy constraints and to the conceptual framing of the included skills for children of young age. This is similar to what occurs with other SEL measures, as noted by Martinez-Yarza et al. (2023).

Heterogeneity is also present in the data collection procedures employed by the different Academies. Despite there being a script, and protocol recommendations for the administration of the SSES by the Academies, each team adjusted the data collection process to its context and participants. This inevitable diversity in procedures was necessary, in order to better meet the needs and characteristics of each specific intervention, target population, and implementation team. However, it also accounts for some heterogeneity in who administered the survey (a teacher, a facilitator, older participants responded autonomously at home), the report format (online or paper), or the setting in which it took place (the classroom, at home, during one of the program sessions). This stands as a limitation to the quality of the data and could have an impact on the validation of the measure.

Because no other instrument to measure social and emotional skills was administered in the GAK context with a comparable sample – both in size and in characteristics – to the SSES, no analysis on concurrent or convergent validity were conducted. This stands as an important limitation, and a strong recommendation for future research using the SSES.

Further research is necessary on the SSES – Child/Youth form's factorial structure, since the solution found in this paper is not clear from a theoretical perspective and does not present a great improvement of the instrument's psychometric properties when compared to its original structure. The fact that the *Energy* subscale was not included in this validation study also stands as a limitation, since there was no data that allowed us to test the validity of the complete 120-item version of this Child/Youth Form.

Similarly, future research should take into consideration individual differences on how these skills develop, to better understand the effectiveness of its measures. Participants' sex and age, for instance, are key features for the development of social and emotional skills, since research has found individual differences based on these two variables (OECD, 2021). The same is true for family characteristics, such as mother's educational level, since it is related to socioeconomic status (e.g.: Aarø et al., 2009) and to the child's success through life (e.g.: Akram and Pervaiz, 2020). The child's socioeconomic status is also related to differences in the development of social and emotional skills (OECD, 2021).

It is also necessary to validate SSES's two other forms – for parents and for teachers, also available in Portuguese – as valuable measures of children's social and emotional skills when reported by meaningful adult figures in their daily lives. Triangulation of informants, by combining the perspectives of children/youth and others around them, ensures greater rigor, quality, and reliability in evaluating these skills, allowing to form a more detailed picture on social and emotional learning and development (Kankaraš et al., 2019). The same is true for methodological triangulation, suggesting the usage of measures beyond self-report and others-report, such as observational tools or situational judgment tests (e.g., Abrahams et al., 2019; Murano et al., 2021).

Conclusion

The purpose of this paper was to add evidence on a valuable measure for educational, social and community practitioners for evaluating social and emotional skills in their target audiences, as well as the effectiveness of their SEL interventions. Our results, strengthened by a very large and representative national sample, contribute to prove the utility of this measure for educational and community practitioners to inform and guide their works on social and emotional skills with a varied set of participants, adequately measuring their needs and their strengths. It is particularly useful given the diversity of available instruments under different conceptual frameworks and which focus on a specific skill, or subset of skills. The SSES was developed as a comprehensive measure for a large set of social and emotional skills, anchored in a sound, common theoretical framework.

Data availability statement

The datasets presented in this article are not readily available because the data pertains to several different institutions, being each institution's responsibility to grant access. Requests to access the datasets should be directed to pgconhecimento@gulbenkian.pt.

Ethics statement

Ethical approval was not required for the study involving human samples in accordance with the local legislation and institutional requirements because the paper presents only secondary data analysis of data collected by third parties and was completely anonymized prior to analysis. All third parties guaranteed data anonymity, thereby protecting participant identity and maintaining privacy. Written informed consent for participation in this study was provided by the participants' legal guardians/next of kin.

Author contributions

CCa conducted data cleaning, data analysis, and wrote sections of the manuscript. JA contributed to the introduction and discussion sections of the manuscript and conducted a final revision. CB conducted data cleaning, contributed to data analysis and interpretation, and a review of the manuscript. CCo conducted data cleaning and a final revision of the manuscript. All authors contributed to the article and approved the submitted version.

Funding

CCa was funded by the Portuguese Foundation for Science and Technology (FCT) doctoral grant (UI/BD/154443/2022). CB was funded by the FCT through the CEEC institutional funding (CEECINST/00126/2021).

Acknowledgments

The authors would like to thank all Academies, their participants and families, as well as the Calouste Gulbenkian Foundation, for contributing to making this work possible.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Publisher's note

All claims expressed in this article are solely those of the authors and do not necessarily represent those of their affiliated organizations, or those of the publisher, the editors and the reviewers. Any product that may be evaluated in this article, or claim that may be made by its manufacturer, is not guaranteed or endorsed by the publisher.

Supplementary material

The Supplementary material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/fpsyg.2023.1214032/full#supplementary-material

References

Aarø, L. E., Flisher, A. J., Kaaya, S., Onya, H., Namisi, F. S., and Wubs, A. (2009). Parental education as an indicator of socioeconomic status: improving quality of data by requiring consistency across measurement occasions. *Scand. J. Public Health* 37, 16–27. doi: 10.1177/1403494808086917

Abrahams, L., Pancorbo, G., Primi, R., Santos, D., Kyllonen, P., John, O. P., et al. (2019). Social-emotional skill assessment in children and adolescents: advances and challenges in personality, clinical, and educational contexts. *Psychol. Assess.* 31, 460–473. doi: 10.1037/pas0000591

Akram, S., and Pervaiz, Z. (2020). Mother's education as a predictor of Individual's opportunities to learn and earn. *Element. Educ.* 19, 879–884. doi: 10.17051/ilkonline.2020.04.196

Boudett, K. P., City, E. A., and Murnane, R. J. (2013). *Data Wise: A Step-by-Step Guide to Using Assessment Results to Improve Teaching and Learning*. Harvard Education Press.

Boudett, K. P., Murnane, R. J., City, E., and Moody, L. (2005). Teaching educators how to use student assessment data to improve instruction. *Phi Delta Kappan*, 86, 700–706.

Brush, K. E., Jones, S. M., Bailey, R., Nelson, B., Raisch, N., and Meland, E. (2022). Social and emotional learning: From conceptualization to practical application in a global context. *Life skills education for youth: Critical perspectives*. 43–71.

Chernyshenko, O., Kankaraš, M., and Drasgow, F. (2018). *Social and emotional skills for student success and well-being: conceptual framework for the OECD study on social and emotional skills (OECD Education Working Papers No. 173), OECD Education Working Papers*. Paris: OECD Publishing.

Clarke, A.M., Morreale, S., Field, C.-A., Hussein, Y., and Barry, M.M. (2015). What works in enhancing social and emotional skills development during childhood and adolescence? A review of the evidence on the effectiveness of school-based and out-of-school programmes in the UK. A report produced by the World Health Organization Collaborating Centre for Health Promotion Research, National University of Ireland Galway. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/411492/What_works_in_enhancing_social_and_emotional_skills_development_during_childhood_and_adolescence.pdf (Accessed June 6, 2022).

Comrey, A. L., and Lee, H. B. (eds.). (1992). Interpretation and application of factor analytic results. *A first course in factor analysis*, 2.

Denham, S. A., Wyatt, T. M., Bassett, H. H., Echeverria, D., and Knox, S. S. (2009). Assessing social-emotional development in children from a longitudinal perspective. *J. Epidemiol. Community Health* 63, i37–i52. doi: 10.1136/jech.2007.070797

Domitrovich, C., Durlak, J., Staley, K., and Weissberg, R. (2017). Social-emotional competence: an essential factor for promoting positive adjustment and reducing risk in school children. *Child Dev.* 88, 408–416. doi: 10.1111/cdev.12739

Duckworth, A. L., and Yeager, D. S. (2015). Measurement matters: Assessing personal qualities other than cognitive ability for educational purposes. *Res. Educ.* 44, 237–251. doi: 10.3102/0013189X15584327

Durlak, J., and DuPre, E. (2008). Implementation matters: a review of research on the influence of implementation on program outcomes and the factors affecting implementation. *Am. J. Community Psychol.* 8, 327–350. doi: 10.1007/s10464-008-9165-0

Dziuban, C. D., and Shirkey, E. C. (1974). When is a correlation matrix appropriate for factor analysis? Some decision rules. *Psychol. Bull.* 81, 358–361. doi: 10.1037/h0036316

Gedikoglu, M. (2021). *Social and emotional learning: an evidence review and synthesis of key issues*. London, UK: Education Policy Institute.

Hill, M. (2019). Culturally responsive social and emotional learning (SEL). Inspired Ideas. Available at: https://medium.com/inspired-ideas-prek-12/culturally-responsive-social-and-emotional-learning-be7fb6e3d58d (Accessed July 28, 2023).

Humphrey, N., Kalambouka, A., Wigelsworth, M., Lendrum, A., Deighton, J., and Wolpert, M. (2011). Measures of social and emotional skills for children and young people: a systematic review. *Educ. Psychol. Meas.* 71, 617–637. doi: 10.1177/0013164410382896

Hutcheson, G.D., and Sofroniou, N. (1999). *The multivariate social scientist: introductory statistics using generalized linear models*. Thousand Oaks, CA: SAGE.

Jager, R. J., Rivas-Drake, D., and Borowski, T. (2018). Equity & Social and emotional learning: a cultural analysis. Framework briefs: Special issue series. Measuring SEL – Using Data to Inspire Practice.

Kankaraš, M., Feron, E., and Renbarger, R. (2019). *Assessing students' social and emotional skills through triangulation of assessment methods (OECD Education Working Papers No. 208), OECD Education Working Papers*. Paris: OECD Publishing.

Kankaraš, M., and Suarez-Alvarez, J., (2019). *Assessment framework of the OECD study on social and emotional skills (OECD Education Working Papers No. 207), OECD Education Working Papers*. Paris: OECD Publishing

Marôco, J. (2018). *Análise Estatística com o SPSS Statistics, 7a edição*. Pêro Pinheiro: ReportNumber, Lda.

Martinez-Yarza, N., Santibáñez, R., and Solabarrieta, J. (2023). A systematic review of instruments measuring social and emotional skills in school-aged children and adolescents. *Child Ind. Res.* 16, 1475–1502. doi: 10.1007/s12187-023-10031-3

Martinsone, B., Stokenberga, I., Damberga, I., Supe, I., Simões, C., Lebre, P., et al. (2022). Adolescent social emotional skills, resilience and behavioral problems during the COVID-19 pandemic: a longitudinal study in three European countries. *Front. Psych.* 13:942692. doi: 10.3389/fpsyt.2022.942692

McCrae, R. R., and Costa, P. T. Jr. (1997). Personality trait structure as a human universal. *Am. Psychol.* 52, 509–516. doi: 10.1037/0003-066X.52.5.509

Murano, D., Lipnevich, A. A., Walton, K. E., Burrus, J., Way, J. D., and Anguiano-Carrasco, C. (2021). Measuring social and emotional skills in elementary students: development of self-report Likert, situational judgment test, and forced choice items. *Personal. Individ. Differ.* 169:110012. doi: 10.1016/j.paid.2020.110012

OECD (2021). *Beyond academic learning: first results from the survey of social and emotional skills 2019*. Paris: OECD Publishing

Pasquili, L. (1999). *Instrumentos psicológicos: Manual prático de elaboração*. Brasília, Brasil: LabPAM/ IBAPP.

Payton, J., Weissberg, R.P., Durlak, J.A., Dymnicki, A.B., Taylor, R.D., Schellinger, K.B., et al. (2008). *The positive impact of social and emotional learning for kindergarten to eighth-grade students: findings from three scientific reviews*. Chicago, IL: Collaborative for Academic, Social, and Emotional Learning.

Pereira, A., and Patrício, T. (2008). SPSS: Guia prático de utilização. *Análise de dados para ciências sociais e psicologia*, 7.

Martins, G. D. O., Gomes, C. A. S., Brocardo, J., Pedroso, J. V., Camilo, J. L. A., Silva, L. M. U., et al. (2017). Perfil dos alunos à saída da escolaridade obrigatória. Lisbon, Portugal: Ministério da Educação / Direção Geral da Educação. Available at: https://comum.rcaap.pt/bitstream/10400.26/22377/1/perfil_dos_alunos.pdf (Accessed June 3, 2023).

Smith-Donald, R., Raver, C. C., Hayes, T., and Richardson, B. (2007). Preliminary construct and concurrent validity of the preschool self-regulation assessment (PSRA) for field-based research. *Early Child. Res. Q.* 22, 173–187. doi: 10.1016/j.ecresq.2007.01.002

Tabachnick, B.G., and Fidell, L.S. (2007). *Using multivariate statistics, using multivariate statistics, 5th ed.* Allyn & Bacon/Pearson Education, Boston, MA.

Tackett, J. L., Slobodskaya, H. R., Mar, R. A., Deal, J., Halverson, C. F. Jr, Baker, S. R., et al. (2012). The hierarchical structure of childhood personality in five countries: Continuity from early childhood to early adolescence. *J. Pers.* 80, 847–879.

Tanner-Smith, E. E., Durlak, J. A., and Marx, R. A. (2018). Empirically based mean effect size distributions for universal prevention programs targeting school-aged youth: a review of meta-analyses. *Prev. Sci.* 19, 1091–1101. doi: 10.1007/s11121-018-0942-1

Weissberg, R., Durlak, J., Domitrovich, C., and Gullotta, T. P. (2015). "Social and emotional learning: past, present and future" in *Handbook for Social and Emotional Learning*. eds. J. A. Durlak, C. E. Domitrovich, R. P. Weissberg and T. P. Gullotta (New York: Guilford), 3–19.

frontiers | Frontiers in Psychology

TYPE Original Research
PUBLISHED 28 August 2023
DOI 10.3389/fpsyg.2023.1233335

OPEN ACCESS

EDITED BY
Pedro Rosário,
University of Minho, Portugal

REVIEWED BY
Guida Veiga,
University of Evora, Portugal
Maria Fernanda Lara-Diaz,
National University of Colombia, Colombia

*CORRESPONDENCE
Rita Antunes
✉ rita_alex_antunes@hotmail.com
Joana Alexandre
✉ joana.alexandre@iscte-iul.pt

RECEIVED 01 June 2023
ACCEPTED 04 August 2023
PUBLISHED 28 August 2023

CITATION
Antunes R, Alexandre J, Guedes M, Filipe MG and Veríssimo M (2023) Assessing the benefits of the "Intergalactic World" social emotional learning program for 8–12-year-old children in Portugal: perspectives from teachers and caregivers. *Front. Psychol.* 14:1233335. doi: 10.3389/fpsyg.2023.1233335

Assessing the benefits of the "Intergalactic World" social emotional learning program for 8–12-year-old children in Portugal: perspectives from teachers and caregivers

Rita Antunes[1,2,3]*, Joana Alexandre[4]*, Maryse Guedes[3], Marisa G. Filipe[5] and Manuela Veríssimo[4]

[1]Center for Research in Psychology for Positive Development, Lusíada University of Lisbon, Lisbon, Portugal, [2]CUF Descobertas Hospital, Lisbon, Portugal, [3]William James Center for Research—ISPA, Instituto Universitário, Lisbon, Portugal, [4]ISCTE, University Institute of Lisbon, CIS_ISCTE, Lisbon, Portugal, [5]Center of Linguistics, School of Arts and Humanities, University of Lisbon, Lisbon, Portugal

Introduction: "Intergalactic World" is a new social–emotional program designed to reduce psychopathological symptoms and improve social and emotional skills in children aged 8–12. This study aims to evaluate the program's benefits from teachers' and caregivers' perspectives, focusing on internalizing and externalizing behaviors.

Methods: The findings were obtained through self-reported measures using a pretest-posttest design with a follow-up period, but with no control group. One hundred fifty-four children (*M* age = 9.66, *SD* = 0.78) participated in this intervention study. Eleven teachers completed the Teacher's Report Form (TRF) for these children, and 133 caregivers completed the Child Behavior Checklist (CBCL). Participants without caregivers' reports were excluded from the analysis. Data were collected at three-time points: before the intervention (T1), immediately after (T2), and 6 months after the implementation of the program (T3).

Results: Results (*n* = 133) showed an effect of time on the Internalization scores (at T3 for teachers and T2 and T3 for caregivers) with no gender effect and a decrease in the perception of externalizing behaviors with a gender effect: Boys were perceived as exhibiting more externalizing behaviors than girls. However, these behaviors significantly decrease at T3 for teachers and at T2 and T3 for caregivers.

Discussion: Despite its limitations, this study highlights the benefits of employing social–emotional programs to help reduce children's internalizing and externalizing behaviors. A multi-informant approach enables a comprehensive analysis and provides insights into the child's significant contexts and interactions with adults.

KEYWORDS

social–emotional learning programs, internalizing behaviors, externalizing behaviors, caregivers, teachers

Introduction

Social and emotional skills positively impact learning and important life outcomes, promoting positive social behavior and reducing conduct problems (Kankaraš and Suarez-Alvarez, 2019; Chatterjee Singh and Duraiappah, 2020). These skills are particularly important for children with behavioral problems, encompassing either internalizing or externalizing

behaviors. Externalizing behaviors include hyperactivity, attention problems, and conduct problems (e.g., opposition). On the other hand, internalizing behaviors typically consist of self-directed difficulties (Achenbach and Edelbrock, 1978), such as anhedonia and negative moods and emotions (Schuman-Olivier et al., 2020), which are associated with various depressive and anxiety disorders (Hansen and Jordan, 2020).

The literature shows that boys usually display more externalizing behaviors than girls, whereas girls tend to exhibit more internalizing behaviors (Eme, 2016; Gutman and McMaster, 2020; Lau et al., 2021). Children and young people with behavioral problems suffer from emotional and behavioral regulation changes, leading to frequent referrals to mental health services and substantial burdens for families and organizations (Scott et al., 2001).

Despite the existence of several conceptual frameworks (e.g., Chernyshenko et al., 2018), the Collaborative for Academic, Social, and Emotional Learning (2012) defines social–emotional learning (SEL) as "the processes through which children and adults acquire and effectively apply the knowledge, attitudes, and skills necessary to understand and manage emotions, set and achieve positive goals, feel and show empathy for others, establish and maintain positive relationships, and make responsible decisions" (p. 9).

Delivering evidence-based SEL programs worldwide is an important pathway to enhance social–emotional competencies. However, the efficacy and effectiveness of SEL programs have been mainly studied in Anglo-Saxon countries, with fewer studies conducted in Ibero-American regions (Fernández-Martín et al., 2021).

"Intergalactic World" program

The "Intergalactic World" was developed in response to the need for SEL programs for children attending primary and secondary schools in Portugal (Cristóvão et al., 2017; Antunes et al., 2022; Antunes, in press), which is considered an Ibero-American region according to some definitions. This eight-session prevention program (*cf.* details in Table 1) aims to promote self-regulation, self-control, and attentional focus in children aged between 8 and 12 years old.

Based on a literature review (e.g., Sanders, 2008; Webster-Stratton, 2016), the program was designed as a psychoeducational and ludo-therapeutic resource. Each session has an average duration of 60 min, with a weekly frequency. The sessions incorporate relaxation dynamics and cognitive-behavioral training (e.g., Ferraioli and Harris, 2013; Black and Fernando, 2014; Raveepatarakul et al., 2014; Vickery and Dorjee, 2015; Huguet et al., 2017), as there is evidence showing that cognitive and behavioral interventions are a promising avenue for promoting social–emotional competencies, and self-control, in particular (Smith et al., 2019). Typically, the program is implemented by two trained group leaders, with one having a mandatory background in psychology.

A pilot study for this program was already conducted with 95 children, although with no control group (Antunes et al., 2022). The results showed that both younger children (8–9 years old) and older children (10–12 years old), regardless of gender, reported a reduction in psychopathological symptoms (anxiety, depression, and stress) and an improvement in overall socio-emotional skills from the pretest to the posttest and follow-up.

The present study

Considering that multiple informants' evaluations provide incremental validity beyond a single type of measurement (e.g., children's self-report measures) and help capture differences in child behavior across different contexts (Alexander et al., 2017), and considering the limited number of studies conducted in Ibero-American regions on this topic, the present study aimed to evaluate the benefits of the "Intergalactic World" SEL program in Portugal from the perspectives of teachers and caregivers.

This study expected to observe a reduction in internalizing and externalizing behaviors from T1 to T2 and T3, with potential gender differences. Specifically, a significant reduction in externalizing behaviors was anticipated in the posttest and follow-up for boys, while girls were expected to exhibit lower overall levels of externalizing behaviors. For internalizing problems, based on the literature review, a significant reduction in internalizing behaviors was anticipated in the posttest and follow-up for girls, and it was expected that boys would exhibit lower overall levels of such behaviors.

By conducting research on SEL programs in diverse cultural and linguistic contexts, including Ibero-American regions, this study contributes to a better understanding of the efficacy and applicability of such programs across different populations. It also addresses the limited number of studies conducted in these regions, providing valuable insights into the potential benefits of the "Intergalactic World" program in Portugal.

Methods

Study design

The study employed a pretest-posttest design with a follow-up period and did not include a control group. The data were collected at three different time points: pre-intervention assessment (Time 1, T1), post-program evaluation (Time 2, T2), and 6-month follow-up (Time 3, T3). The T1 assessment was conducted from January to March 2019. Subsequently, the T2 assessment occurred in March and April, 1 week after the completion of the 'Intergalactic World' program. Finally, the T3 assessment was conducted in November and December, representing a follow-up evaluation conducted 6 months after the conclusion of the program, to examine the longer-term effects.

Participants

A total of 154 children, aged between 8 and 12 years ($M = 9.59$ years, $SD = 0.86$), participated in this intervention study. All children attend public schools from the urban Lisbon area. Schools from areas of diverse socio-economic status were included. Eleven teachers provided information about these children. Almost all teachers were female ($n = 10$), with an average age of 42.25 years ($SD = 4.62$) and an average of 17.29 years of professional experience ($SD = 4.15$; $Min = 11$ years; $Max = 21$ years).

Caregivers provided information about 133 children. The majority of the caregivers were also female ($n = 125$) and had an average age of 41.14 years ($SD = 6.63$). Regarding the caregivers' educational status, data showed that 30% of participating families were in the

10.3389/fpsyg.2023.1233335

TABLE 1 "Intergalactic World" program: goals and session activities (Antunes, in press).

Session number	Goals	Dynamics (1) and exercise key contents (2)
1	Understand the concept of informed consent/assent Promoting social–emotional competencies Main SEL domains: Self-knowledge Self-management Social consciousness Interpersonal relationship	(1) - Welcome and provide information. - Introduce group leaders. - Relaxation activity. - "My Intergalactic Passport." - "My Superpowers": Discovering my inner Superhero. - "My Superpowers" (Super Adventure). (2) - Relaxation dynamics mediated by deep breathing exercises and music. - Reflection about personal characteristics, behaviors, and feelings associated. - Discover and share what you consider to be your potential.
2	Promoting social–emotional competencies Main SEL domains: Self-management Social consciousness Interpersonal relationship	(1) - "An Intergalactic Day." - "School in the Galaxy of Behavior." - "My superpowers" (Super Creativity). (2) - Reflection exercises and interpersonal sharing about their daily routines vs. ideal routines (at school and at home). Sharing of tastes and interests vs. mediated by graph-expressive expression activities (e.g., drawing and free writing). - Exercise of mime and reflection in small groups.
3	Promoting social–emotional competencies Main SEL domains: Self-knowledge Self-management Social consciousness Responsible decision making	(1) - "The Theater of Intergalactic Emotions." - "The Intergalactic Mirror." - "My superpowers" (Super Energy). (2) - Reflection on feelings and emotions mediated by images of the four basic emotions (happiness, sadness, fear, and anger) and by dramatization and emotional venting exercises. - Sharing in small groups and then in a large group: Exercises in groups of two. - Face to face, define which child is the "mirror," who copies the movements, and which one defines the movements. Then ask them to copy the movements of each other, in a large group mediated by different music, rhythms, and speeds.
4	Promoting social–emotional competencies Main SEL domains: Self-knowledge Self-management Social consciousness Interpersonal relationship Responsible decision making	(1) - "Intergalactic relaxation." - "An apple at the 'Intergalactic world.'" - "My superpowers" (Super Attention). (2) - Reflection and relaxation exercises mediated by imagery and dramatization (e.g., Asking them to move around the room as if they were an astronaut on the Moon) and share emotions and feelings associated. - Emotional ventilation exercises based on the five senses (sight, hearing, smell, touch, and taste), e.g., explore an apple as if it were "the first time" and share the associated experiences.
5	Promoting social–emotional competencies Main SEL domains: Self-knowledge Self-management Social consciousness Interpersonal relationship Responsible decision making And attentional focus in particular	(1) - "Discover Intergalactic Objects." - The Party in Space." - "My Superpowers": What superpower would you like to receive? Design it and give it a creative name! (2) - Attention games like "find lost objects" in the "galaxy of feelings and behaviors" mediated by images and memorized exercises. - Exercise in pairs to build a fun moment for a party (e.g., a dance, a game, and a theater) and at the end build the "best party ever" in a large group.

(Continued)

TABLE 1 (Continued)

Session number	Goals	Dynamics (1) and exercise key contents (2)
6	Promoting social–emotional competencies Main SEL domains: Self-knowledge Self-management Social consciousness Interpersonal relationship Responsible decision making And attentional focus in particular	(1) - The Intergalactic School. - A House on Mars. - "My Superpowers" (Super Ideas and Super Happiness). (2) - Reflection exercises about school and friendships mediated by role-plays, mimiques, or drawing "our super planet"—do the same about home and family. - In a large group, build "the best school and the best house ever" mediated by role-plays, drawings, mimes, dramatizations, and creative writing exercises.
7	Promoting social–emotional competencies Main SEL domains: Self-knowledge Self-management Social consciousness Interpersonal relationship Responsible decision making	(1) - "A Statue in the Intergalactic Galaxy." - "A toast to the Intergalactic Union." - "My Superpowers" (Super Strength and Super Protection). (2) - Paired balance games (e.g., statue game; no smiling; and do like me). - Work on imagery (e.g., a trip to your own planet "galaxy of feelings and behaviors"—imagine for 5 min; give emphasis to transmission to the others your sensations: smells, colors, details…). - And after in scenario paper, add all the planets to the "galaxy of feelings and behaviors" and give it an important role.
8	Promoting social–emotional competencies Main SEL domains: Self-knowledge Self-management Social consciousness Interpersonal relationship	(1) - "Intergalactic Friendship." - "Emotions in Space." - "My Superpowers": What superpower would you like to receive? - Design it and give it creative name! - Delivery the Intergalactic Program Diploma. (2) - Drawing exercises and reflection on your "intergalactic friend" mediated by sharing in pairs and then in a large group about characteristics, behaviors and feelings associated with them. - Ventilation games and emotional expression (e.g., can "Intergalactics" express emotions just like us?), through movement and the body. Role-play exercises, freezes and puppets.

medium-qualified category, 22% were in the medium-qualified, and 49% were in the low-qualified category.[1]

Although initially 154 children participated in this intervention study, the final sample was limited to 133 children (M age = 9.66, SD = 0.78) due to the availability of the information collected from both parents and teachers. The final sample included a balanced distribution of boys and girls (52% boys and 48% girls).

Measures

Caregivers completed a sociodemographic data questionnaire (i.e., age, gender, and academic qualifications) and the European Portuguese version of the Child Behavior Checklist (CBCL/6–18 version; Achenbach and Rescorla, 2000; Achenbach et al., 2014) at T1, T2, and T3 evaluation times. The CBCL is a 113-item standardized checklist administered to caregivers to detect behavioral and emotional problems in children and adolescents aged 6–18 years. Caregivers respond to the items on a three-point Likert scale (0—Not True, 1 — Somehow or Sometimes True, and 2—Very True or Often True). The time frame for item responses is the past 6 months. The CBCL includes syndrome scales combined to produce an Internalizing score (Anxious/Depressed, Withdrawn/Depressed, and Somatic Complaints) and an Externalizing score (Rule-Breaking Behavior and Aggressive Behavior). Higher scores in the CBCL indicate increased symptom severity, with T-scores above 69 indicating clinically elevated symptoms. For the Portuguese adaptation, Cronbach's alphas for the dimensions of problems ranged between 0.845 (Internalization) and 0.957 (Total Problems) in the normative sample and between 0.846 (Internalization) and 0.934 (Total Problems) in a clinical sample. In the present sample, Cronbach's alphas vary within the same range, and the average inter-item correlation for all the items on the internalization and externalization scales ranged between 0.66 and 0.72.

Teachers also completed a sociodemographic questionnaire (i.e., age, gender, and years of professional experience) and the European Portuguese version of the Teacher's Report Form (TRF; Achenbach and Rescorla, 2000; Achenbach et al., 2014). The TRF is a questionnaire

1 Professional categories followed the employment/educational status classification of the Portuguese Classification of Jobs (retrieved from http://cdp.portodigital.pt/profissoes/classificacao-nacional-das-profissoes-cnp).

completed by teachers or other school personnel closely interacting with the child. From the teacher's perspective, it assesses behavioral and emotional problems of children aged between 6 and 18 years. The TRF shares similarities with the CBCL regarding item content but is specifically adapted to capture behaviors and symptoms that are more relevant in the school environment. This tool consists of 113 items, answered on a three-point Likert scale (0—Not True, 1—Somehow or Sometimes True, and 2—Very True or Often True). The time frame for item responses is the past 2 months. The TRF includes syndrome scales combined to produce an Internalizing score (Anxiety/Depression, Withdrawn/Depressed, and Somatic Complaints) and an Externalization score (Rule-Breaking Behavior and Aggressive Behavior). Higher scores on the TRF also indicate greater symptom severity, with T-scores above 69 indicating clinically elevated symptoms. Test–retest reliabilities for the broadband scales range from 0.77 to 0.89, demonstrating acceptable consistency over time. For the Portuguese adaptation, Cronbach's alphas ranged between 0.83 (Internalization) and 0.94 (Total Problems) in the normative sample and between 0.85 (Internalization) and 0.96 (Total Problems) in a clinical sample. In the current sample, Cronbach's alphas in the present sample varied between 0.72 (Internalization at T2) and 0.97 (Total Problems and Externalization at T2), and the average inter-item correlation for all the items on both internalization and externalization scales ranged between 0.27 and 0.89.

Procedures

This study was conducted as a part of a broader research project, approved by the Ethics Committee of one of the universities to which the authors belong and by the Survey Monitoring System from the Portuguese Education Ministry.

The "Intergalactic's World" was presented to different schools during October and November 2018. Detailed contacts were made with the ones that expressed interest in implementing the program. Informed consent forms providing information about the study's goals, the voluntary nature of participation, and the confidentiality of collected data were provided. Written authorization from the school boards was also obtained. After signing the informed consent, teachers completed the evaluation protocol. Before the beginning of the assessments, caregivers also provided written consent for their children's participation in the study.

The intervention groups comprised approximately 20 children who met weekly for approximately 90 min per session. Each group was led by two trained group leaders who adhered to the structured manual and completed self-evaluations and checklists after each meeting to ensure program fidelity. Moreover, the group leaders received regular supervision. The participant's compliance with the program was excellent (98% attendance rate), with only occasional absences due to illness. The attrition from intervention rate in this study was 2%.

The intervention sessions were conducted in school settings for most children. However, it is important to note that the intervention for 11 children occurred within a Social Solidarity Private Institution (IPSS), even though these children were also attending the same public schools.

The TRF questionnaire was completed with face-to-face support from the research team to clarify doubts and address additional questions. On the other hand, caregivers filled out the CBCL questionnaire at home. Both teachers and caregivers took an average of 2 weeks to answer the questionnaires at the three different time points. The research team provided contacts (such as email and meeting points) to clarify doubts and address additional questions.

Data analysis

Data were analyzed using the Statistical Package for the Social Sciences (SPSS version 27). Distance-based outlier detection methods (i.e., Mahalanobis and Cook's distances) revealed that the dataset did not include any outliers or influential points.

A repeated measures ANOVA was conducted to examine the effects of time (within-subjects variable) and gender (between-subjects variable) on Internalization and Externalization subscales of the CBCL and the TRF, as rated by caregivers and teachers. *Post hoc* analyses were conducted, and the effect sizes were reported using partial eta squared. Alpha was set at 0.05 for this model.

In this study, missing data were addressed using pairwise deletion. This method involves considering only the available data for each specific analysis. If a particular data point was missing, it was excluded only for that specific analysis, while the remaining existing data were used in the statistical testing. This approach helps to minimize biases and retain as much information as possible for the analysis.

As Mauchly's test of sphericity yielded significant results, the Greenhouse–Geisser corrected F values were reported. In cases where a significant overall F value was observed, pairwise comparisons using Bonferroni correction were performed to compare the individual time points.

Results

A Repeated Measures ANOVA was conducted to examine the impact of time (within-subjects) and gender (between-subjects) on the Internalization and Externalization scores obtained from the CBCL and TRF questionnaires. Table 2 provides a comprehensive overview of the means, standard deviations, and results of the repeated measures ANOVA for the Internalization and Externalization subscales.

The analysis of the CBCL data revealed a significant effect of time on the Internalization score, F (1.199, 155.886) = 369.929, $p < 0.001$. This indicated that time substantially influenced the Internalization score, with a moderate effect size (partial $\eta^2 = 0.74$). It is important to note that the assumption of sphericity was violated, and Greenhouse–Geisser corrections were applied. The interaction effect between time and gender was not statistically significant ($F < 1$), suggesting that the relationship between time and the Internalization score did not differ based on gender. To further investigate the effects of time, within-subject contrasts were performed comparing the scores at T1, T2, and T3 on the Internalization scale. These comprehensive analyses thoroughly investigated the temporal dynamics and uncovered substantial differences across all time points, indicating a statistically significant score reduction at each assessed time point (*cf.* Table 2).

Regarding the Externalization score of CBCL, results also showed a significant effect of time, F (1.212, 157.580) = 356.379, $p < 0.001$. This finding indicated that time exerted a substantial influence on the Externalization score, yielding a moderate effect size (partial $\eta^2 = 0.73$).

TABLE 2 Outcomes' descriptive statistics over time (T1, T2, and T3) and repeated measures ANOVA results.

Variables	Time (T)			Repeated measures ANOVA		Repeated measures ANOVA		
				Tests of within-subject effects		Pairwise Comparisons		
	T1	T2	T3	*F (df)*	*np2*	T1 vs. T2	T2 vs. T3	T1 vs. T3
	M (SD)	*M (SD)*	*M (SD)*					
Internalization subscale–Parents	54.08 (9.72)	51.19 (8.58)	40.23 (6.79)	369.93* (1.199, 155.886)	0.74	3.01*	10.88*	13.89*
Internalization subscale—Teachers	46.21 (10.67)	46.82 (9.85)	39.10 (6.20)	43.849* (1.790, 229.088)	0.26	−0.59	7.62*	7.03*
Externalization subscale—Parents	51.14 (9.32)	49.85 (8.02)	40.18 (7.88)	356.38* (1.212, 157.580)	0.73	1.33*	9.57*	10.90*
Externalization subscale—Teachers	50.58 (10.80)	50.89 (10.8)	44.83 (6.40)	29.43* (1.655, 211.860)	0.19	−0.26	6.10*	5.84*

T1, pre-intervention; T2, post-intervention; and T3, 6-month follow-up. *$p < 0.001$.

It is worth noting that the assumption of sphericity was again violated, and the Greenhouse–Geisser corrections were used. Moreover, a statistically significant interaction effect between time and gender was observed, $F(1, 130) = 6.986$, $p = 0.009$, partial $\eta^2 = 0.51$, suggesting that the relationship between time and the Externalization score differed depending on gender: overall, boys showed more externalizing behaviors than girls, but caregivers reported a reduction over time (*cf.* Table 2). In order to further examine the effects of time, within-subject contrasts were conducted, comparing the scores at T1, T2, and T3 on the Externalization scale. This analysis showed a statistically significant score reduction at each assessed time point (*cf.* Table 2).

The analysis of the TRF data revealed a statistically significant effect of time on the Internalization score as well, $F(1.790, 229.088) = 43.849$, $p < 0.001$. This indicated that time had a substantial impact on the Internalization score, with a moderate effect size (partial $\eta^2 = 0.26$). The results showed that the relationship between time and the Internalization score did not differ based on gender, as the interaction effect was not statistically significant ($F < 1$). To further investigate the effects of time, within-subject contrasts were conducted, comparing the scores at T1, T2, and T3 on the Internalization scale. The within-subject contrasts revealed that only the scores at T3 showed a statistically significant reduction on the Internalization scale (*cf.* Table 2).

The analysis of the TRF data also demonstrated a significant effect of time on the Externalization score, $F(1.655, 211.860) = 29.43$, $p < 0.001$. This indicates that time substantially influenced the Externalization score, with a small effect size (partial $\eta^2 = 0.19$). It is important to note that the assumption of sphericity was violated, and Greenhouse–Geisser corrections were applied. The interaction effect between time and gender was also not statistically significant ($F < 1$), suggesting that the relationship between time and the Internalization score did not differ based on gender. Within-subject contrasts performed comparing the scores at T1, T2, and T3 on the Externalization scale showed that only T3 presented a statistically significant score reduction (*cf.* Table 2).

Discussion

Evidence-based SEL programs have been implemented worldwide. This study aimed to contribute to the evaluation of SEL programs in Portugal, specifically focusing on the "Intergalactic World" program developed for 8–12-year-old children (Cristóvão et al., 2017). Conducting research on social–emotional learning (SEL) programs in diverse cultural and linguistic contexts has enhanced our understanding of their efficacy and applicability across different populations.

The main objective of this study was to analyze the potential benefits of the "Intergalactic World" program from the perspectives of caregivers and teachers. Adopting a multi-informant approach allowed for a more comprehensive analysis and provided insights into the child's significant contexts and interactions with adults (Alexander et al., 2017). This approach was particularly important when assessing new SEL programs as it helped provide evidence-based information and a more well-rounded perspective on their effectiveness.

Our results are in line with previous findings (Tennant et al., 2017; Scafuto et al., 2022), as teachers and caregivers reported reduced internalizing and externalizing behaviors in children who participated in SEL programs. This reduction was observed immediately after the intervention (T2) and remained evident 6 months after (T3).

However, our results differ from previous studies that have reported small-magnitude improvements in terms of externalizing problems, as perceived by teachers (e.g., Aber et al., 2003; Linares et al., 2005; Hennessey, 2007; Conduct Problems Prevention Research Group, 2010; Jones et al., 2011; Miller et al., 2017). One possible explanation for these differences is that our study focused on assessing short-term effects, as studies on the effectiveness of other SEL programs, such as PATHS in Switzerland (Malti et al., 2011) and 4R in the United States (Jones et al., 2011), which also observed changes in children's aggressive behavior only in the long term (1–2 years after the end of the intervention).

Another potential factor contributing to the contrasting results could be the objectives and contents of the 'Intergalactic's World' program intervention compared to other SEL interventions where teachers perceived short-term changes in externalizing problems. Specifically, school-age SEL interventions, such as Competent Kids, Caring Communities, RBI, RCCP, and Open Circle, lasted for more than 20 sessions and aimed not only to promote self-regulation skills but also to directly address communication skills, problem-solving, and positive peer relationships. On the other hand, the "Intergalactic's World" program aimed to reduce internalizing, externalizing, and other problems (thinking, social, and attention) over eight sessions, incorporating dynamics of relaxation, mindfulness, and cognitive-behavioral training.

Despite its contribution, the study has some major limitations that should be addressed. Firstly, convenience sampling in the urban Lisbon area limits the generalizability of the findings to a broader population. Secondly, the absence of a control group raises the

possibility that factors other than participation in the intervention may have influenced the observed results. Thus, the current study design only allows for partial assumptions on the program's effects on internalizing and externalizing behaviors.

Moreover, the results found at T3 could be influenced by developmental trajectories, as suggested by previous research (Gutman and McMaster, 2020), and the instructions of the measures used by the present study. For instance, respondents were asked to fill in the CBCL and TRF questionnaires considering the last 2 or 6 months of the child's life, which did not specifically target the end of the intervention but rather the entire intervention period.

Additionally, it is worth noting that between T2 and T3, the children had an extended vacation period due to the summer school break. This period off from school could have impacted the results, and it should be considered a potential confounding factor in the interpretation of the findings.

Suggestions for future studies include employing a randomized control trial design with a larger and more diverse sample from various regions of the country. These studies should also consider evaluating the long-term effectiveness of the intervention by conducting follow-ups 1–2 years after the end of the program.

Additionally, future research should adopt a multi-method approach, incorporating focus groups with children and group facilitators. These focus groups can provide valuable qualitative insights into program implementation and identify variables that may contribute to the program's efficacy (Durlak et al., 2011).

Compelling evidence supports the effectiveness of interventions implemented in school contexts for reducing problem behaviors (e.g., Durlak et al., 2011; Taylor et al., 2017). Moreover, these interventions have positively impacted school achievement (Cristóvão et al., 2017). This study sheds light on the significant contributions of the "Intergalactic's World" program, as perceived by teachers and caregivers, emphasizing the need for a stronger evidence-based approach to the program.

In summary, future research should apply more robust study designs, involve larger samples, and incorporate qualitative approaches to better understand the SEL program's effectiveness and implementation. By doing so, we can further enhance the impact of SEL programs like the "Intergalactic's World" on children's well-being and development.

Data availability statement

The original contributions presented in the study are included in the article/supplementary material, further inquiries can be directed to the corresponding authors.

Ethics statement

The studies involving humans were approved by William James Center for Research—ISPA, Instituto Universitário, Portugal. The studies were conducted in accordance with the local legislation and institutional requirements. Written informed consent for participation in this study was provided by the participants' legal guardians/next of kin. Written informed consent was obtained from the individual(s) for the publication of any potentially identifiable images or data included in this article.

Author contributions

RA, MV, JA, and MG contributed to conception and design of the study. RA collected the data. RA and JA wrote the first draft of the manuscript. MF performed the statistical analysis, scoring, data entry, and writing the results. All authors contributed to the article and approved the submitted version.

Funding

CIS_Iscte, Lisbon, Portugal, provided the funding for publishing; William James Center for Research—ISPA, Instituto Universitário, Lisbon, Portugal, and CIS_Iscte, Lisbon, Portugal, provided support for conducting the research (e.g., copies of materials for the program sessions, etc).

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Publisher's note

References

Aber, J. L., Brown, J. L., and Jones, S. M. (2003). Developmental trajectories toward violence in middle childhood: Course, demographic differences, and response to school-based intervention. *Dev. Psychol.* 39, 324–348. doi: 10.1037/0012-1649.39.2.324

Achenbach, T. M., and Edelbrock, C. S. (1978). The classification of child psychopathology: a review and analysis of empirical efforts. *Psychol. Bull.* 85, 1275–1301. doi: 10.1037/0033-2909.85.6.1275

Achenbach, T. M., and Rescorla, L. A. (2000). *Manual for the ASEBA School-Age Forms and Profiles* University of Vermont, Research Center for Children, Youth, and Families.

Achenbach, T. M., Rescorla, L. A., Dias, P., Ramalho, V., Lima, V. S., Machado, B. C., et al. (2014). *Manual do Sistema de Avaliação Empiricamente Validado (ASEBA) Para o Período Pré-Escolar e Escolar*. Psiquilíbrios Edições: Um sistema integrado de avaliação com múltiplos informadores.

Alexander, L. A., McKnight, P. E., Disabato, D. J., and Kashdan, T. B. (2017). When and how to use multiple informants to improve clinical assessments. *J. Psychopathol. Behav. Assess.* 39, 669–679. doi: 10.1007/s10862-017-9607-9

Antunes, R. (in press). *Programa de Competências Socioemocionais: "O Mundo dos Intergalácticos"*. Lisboa: Ideias com História.

Antunes, R., Guedes, M., Alexandre, J., and Veríssimo, M. (2022). Benefícios de um novo programa de aprendizagem socioemocional na redução da sintomatologia psicopatológica e na promoção das competências socioemocionais globais, na perspetiva das crianças. *Psicologia* 36, 119–135. doi: 10.17575/psicologia.1813

Black, D. S., and Fernando, R. (2014). Mindfulness training and classroom behavior among lower-income and ethnic minority elementary school training. *J. Child Fam. Stud.* 23, 1242–1246. doi: 10.1007/s10826-013-9784-4

Chatterjee Singh, N., and Duraiappah, A. K. (Eds.). (2020). *Rethinking learning: a review of social and emotional learning frameworks for education systems*. New Delhi: UNESCO MGIEP.

Chernyshenko, O., Kankaras, M., and Drasgow, F. (2018). *Social and Emotional Skills for Student Success and Well-Being: Conceptual Framework for the OECD Study on Social and Emotional Skills. OECD Education Working Papers, No. 173*. Paris: OECD Publishing.

Collaborative for Academic, Social, and Emotional Learning (2012). *2013 CASEL Guide: Effective Social and Emotional Learning Programs—Preschool and Elementary School Edition*. Chicago, IL: Author.

Conduct Problems Prevention Research Group (2010). The effects of a multiyear universal social-emotional learning program: The role of student and school characteristics. *J. Consult. Clin. Psychol.* 78, 156–168. doi: 10.1037/a0018607

Cristóvão, A. M., Candeis, A. A., and Verdasca, J. (2017). Social and emotional learning and academic achievement in Portuguese schools: A bibliometric study. *Front. Psychol.* 8:1913. doi: 10.3389/fpsyg.2017.01913

Durlak, J. A., Weissberg, R. P., Dymnicki, A. B., Taylor, R. D., and Schellinger, K. B. (2011). The impact of enhancing students' social and emotional learning: A meta-analysis of school-based universal interventions. *Child Dev.* 82, 405–432. doi: 10.1111/j.1467-8624.2010.01564.x

Eme, R. (2016). "Sex differences in the prevalence and expression of externalizing behavior" in *The Oxford Handbook of Externalizing Spectrum Disorders*. eds. T. P. Beauchaine and S. P. Hinshaw (Oxford University Press), 239–263.

Fernández-Martín, F.-D., Romero-Rodríguez, J.-M., Marín-Marín, J.-A., and Gómez-García, G. (2021). Social and emotional learning in the Ibero-American context: A systematic review. *Front. Psychol.* 12:738501. doi: 10.3389/fpsyg.2021.738501

Ferraioli, S. J., and Harris, S. L. (2013). Comparative effects of mindfulness and skills-based parent training programs for caregivers of children with autism: Feasibility and preliminary outcome data. *Mindfulness* 4, 89–101. doi: 10.1007/s12671-012-0099-0

Gutman, L. M., and McMaster, N. (2020). Gendered pathways of internalizing problems from early childhood to adolescence and associated adolescent outcomes. *J. Abnorm. Child Psychol.* 48, 703–718. doi: 10.1007/s10802-020-00623-w

Hansen, L. K., and Jordan, S. S. (2020). "Internalizing behaviors" in *Encyclopedia of Personality and Individual Differences*. eds. V. Zeigler-Hill and T. K. Shackelford (Springer International Publishing), 2343–2346.

Hennessey, B. A. (2007). Promoting social competence in school-aged children: The effects of the Open Circle Program. *J. Sch. Psychol.* 45, 349–360. doi: 10.1016/j.jsp.2006.11.007

Huguet, A., Ruiz, D. M., Haro, J. M., and Alda, J. A. (2017). A pilot study of the efficacy of a mindfulness program for children newly diagnosed with attention-deficit hyperactivity disorder: Impact on core symptoms and executive functions. *Int. J. Psychol. Psychol. Ther.* 17, 305–316.

Jones, S. M., Brown, J. L., and Aber, J. L. (2011). Two-year impacts of a universal school-based social-emotional learning and literacy intervention: An experiment in translational developmental research. *Child Dev.* 82, 533–554. doi: 10.1111/j.1467-8624.2010.01560.x

Kankaraš, M., and Suarez-Alvarez, J. (2019). Assessment framework of the OECD study on social and emotional skills. *OECD Educ. Work. Papers* 207. doi: 10.1787/5007adef-en

Lau, T. W. I., Lim, C. G., Acharryya, S., Lim-Ashworth, N., Tan, Y. R., and Fung, S. S. D. (2021). Gender differences in externalizing and internalizing problems in Singaporean children and adolescents with attention-deficit/hyperactivity disorder. *Child Adolesc. Psychiatry Ment. Health* 15:3. doi: 10.1186/s13034-021-00356-8

Linares, L. O., Rosbruch, N., Stern, M. B., Edwards, M. E., Walker, G., Abikoff, H. B., et al. (2005). Developing cognitive-social-emotional competencies to enhance academic learning. *Psychol. Sch.* 42, 405–417. doi: 10.1002/pits.20066

Malti, T., Ribeaud, D., and Eisner, M. P. (2011). The effectiveness of two universal preventive interventions in reducing children's externalizing behaviour: a cluster randomized controlled trial. *J. Clin. Child Adolesc. Psychol.* 40, 677–692. doi: 10.1080/15374416.2011.597084

Miller, C. F., Kochel, K. P., Wheeler, L. A., Updegraff, K. A., Fabes, R. A., Martin, C. L., et al. (2017). The efficacy of a relationship building intervention in 5th grade. *J. Sch. Psychol.* 61, 75–88. doi: 10.1016/j.jsp.2017.01.002

Raveepatarakul, J., Suttiwan, P., and Iamsupasit, S., and Mikulas,W. L. (2014). A mindfulness enhancement program for Thai 8- to 11-year old children: effects on mindfulness and depression. *J. Health Res.* 28, 335–341

Sanders, M. R. (2008). Triple P-Positive Parenting Program as a public health approach to strengthening parenting. *J. Fam. Psychol.* 22, 506–517. doi: 10.1037/0893-3200.22.3.506

Scafuto, F., Ghiroldi, S., Montecucco, P. F., and Iani, L. (2022). The Mindfulness-Based Gaia Program reduces internalizing problems in high-school adolescents: a cluster randomized controlled trial. *Mindfulness* 13, 1804–1815. doi: 10.1007/s12671-022-01920-9

Schuman-Olivier, Z., Trombka, M., Lovas, D. A., Brewer, J. A., Vago, D. R., Gawande, R., et al. (2020). Mindfulness and Behavior Change. *Harv. Rev. Psychiatry* 28, 371–394. doi: 10.1097/HRP.0000000000000277

Scott, S., Knapp, M., Henderson, J., and Maughan, B. (2001). Financial cost of social exclusion: follow up study of antisocial children into adulthood. *BMJ* 323, 191–194. doi: 10.1136/bmj.323.7306.191

Smith, T., Panfil, K., Bailey, C., and Kirkpatrick, K. (2019). Cognitive and behavioral training interventions to promote self-control. *J. Expe. Psychol. Anim. Learn. Cogn.* 45, 259–279. doi: 10.1037/xan0000208

Taylor, R. D., Oberle, E., Durlak, J. A., and Weissberg, R. P. (2017). Promoting positive youth development through school-based social and emotional learning interventions: A meta-analysis of follow-up effects. *Child Dev.* 88, 1156–1171. doi: 10.1111/cdev.12864

Tennant, R. G., Martin, K. K., Rooney, R., Hassan, S., and Kane, R. T. (2017). Preventing internalizing problems in young children: A randomized controlled trial of the feelings and friends (Year 3) program with a motor skills component. *Front. Psychol.* 8:291. doi: 10.3389/fpsyg.2017.00291

Vickery, C., and Dorjee, D. (2015). Mindfulness training in primary schools decreases negative affect and increases meta-cognition in children. *Front. Psychol.* 6:2025. doi: 10.3389/fpsyg.2015.02025

Webster-Stratton, C. (2016). "The Incredible Years® series: a developmental approach," in *Family-Based Prevention Programs for children and Adolescents: Theory, Research, and Large-Scale Dissemination*. (eds.) RyzinM. J. Van, K. L. Kumpfer, G. M. Fosco and M. T. Greenberg (New York: Psychology Press), 42–67

frontiers | Frontiers in Psychology

TYPE Original Research
PUBLISHED 26 September 2023
DOI 10.3389/fpsyg.2023.1195534

OPEN ACCESS

EDITED BY
Pedro Rosário,
University of Minho, Portugal

REVIEWED BY
Alexandra M. Araújo,
Portucalense University, Portugal
Luis Felipe Dias Lopes,
Federal University of Santa Maria, Brazil

*CORRESPONDENCE
Vítor Gamboa
✉ vgamboa@ualg.pt

RECEIVED 28 March 2023
ACCEPTED 14 September 2023
PUBLISHED 26 September 2023

CITATION
Gamboa V, Rodrigues S, Bértolo F, Marcelo B and Paixão O (2023) Curiosity saved the cat: socio-emotional skills mediate the relationship between parental support and career exploration.
Front. Psychol. 14:1195534.
doi: 10.3389/fpsyg.2023.1195534

Curiosity saved the cat: socio-emotional skills mediate the relationship between parental support and career exploration

Vítor Gamboa[1,2]*, Suzi Rodrigues[1], Filipa Bértolo[1], Beatriz Marcelo[1] and Olímpio Paixão[1]

[1]Faculty of Human and Social Sciences, University of Algarve, Faro, Portugal, [2]Research Center for Psychological Science, University of Lisbon, Lisbon, Portugal

According to career literature, greater parental support seems to be associated with higher levels of career exploration. This relationship may be mediated by self-regulatory processes, such as social–emotional skills, as curiosity. However, despite the large number of empirical studies that analyze the antecedents of career exploration, there are no references, to our knowledge, to the role of socio-emotional skills. Following this gap, the present study aims to examine the extent to which perceived parental support is associated with career exploration through the mediating effect of curiosity (socio-emotional skill), among a group of 8th and 9th grade students from public schools in southern Portugal ($N = 540$). An integrated model was conducted using AMOS 20.0 and the results revealed that curiosity is a partial mediator of the relationship between perceived parental support and career exploration. These results highlight the importance of considering socio-emotional skills (such as curiosity) when designing interventions to foster adaptive career behaviors. Theoretical and practical implications are discussed to open the opportunity to progressively extend the participation of proximal contexts (e.g., families) to career and socio-emotional skills development processes.

KEYWORDS

career exploration, parental support, curiosity, socio-emotional, skills mediation analysis

1. Introduction

In the Portuguese educational system, the choice of the secondary education course is an important decision in which 8th and 9th grades students are involved. This career decision can be extremely challenging and can have medium and long-term effects on the individuals' life courses (Germeijs and Verschueren, 2007; Saka and Gati, 2007). Despite not being a homogeneous group on how they solve vocational tasks, adolescents must explore different training paths and reflect about their interests, aspirations, and personal projects (Gamboa et al., 2014; Paixão and Gamboa, 2017). According to literature, there are two main reasons on why the career decisions that 8th and 9th grade students are involved can be so demanding: 1) the possible inexperience in making career decisions and the absence of objective criteria to support a good decision; and 2) the increasing complexity that characterizes the occupational world (Savickas, 2005; Blustein, 2006). In addition, these decisions may also be accompanied by high levels of anxiety, which may require the security and structure that is provided by parental

support (Kenny and Medvide, 2013; Katz et al., 2018). In fact, parental support has been widely considered as being crucial to develop career adaptive behaviors (e.g., career exploration) (e.g., Whiston and Keller, 2004; Hartung et al., 2005; Kenny and Medvide, 2013; Ahn et al., 2022). Some empirical studies that have analyzed this relationship suggest that greater parental support is associated with higher levels of career exploration (Turan et al., 2014; Guan et al., 2015), and lower levels of indecision (Guay et al., 2003).

According to the career decision-making literature, this relationship may be mediated and moderated by self-regulatory processes, as will be the case of socio-emotional skills (e.g., Young et al., 1997; Blustein and Flum, 1999; Guay et al., 2003; Saka and Gati, 2007; Lent et al., 2016; Lipshits-Braziler et al., 2016; Paixão and Gamboa, 2022). Socio-emotional skills can be defined as the ability to regulate thoughts, emotions, and behaviors, and can be developed throughout life, through formal and informal learning experiences, in school and family contexts, for example (Kankaras and Suarez-Alvarez, 2019). It is during adolescence that we can observe a significant development of these types of self-regulatory skills (e.g., tolerance and curiosity), which can play a crucial role in how students deal with vocational tasks during the transition to secondary education (Chernyshenko et al., 2018). According to Howard and Ferrari (2021), the growing interest in the relationship between socio-emotional skills and career development stems from the idea that managing emotions facilitates exploration and progress in career decision-making. Thus, in complex tasks such as choosing a secondary school course, socio-emotional skills are pivotal in the way each student deals with the stress and ambiguity often associated with career exploration. In other words, students with higher levels of socioemotional skills are less likely to drop out when facing difficulties during career exploration activities (Di Fabio et al., 2012; Di Fabio and Kenny, 2015). The socio-emotional skill of curiosity, which is anchored in openness to experience (OECD, 2021), is defined as the interest in learning and exploring the unknown, and in taking risks. Curiosity may relate to information seeking behaviors associated to the self and occupational contexts. Thus, in our approach to the study of the influence of socioemotional skills we chose to focus on curiosity, as it assumes a crucial role in career exploration and in the most established career theories (e.g., Career Construction Theory, Savickas, 2005). Therefore, the main objective of this study was to analyze the relationship between parental support and career exploration, considering the mediating effect of an important socio-emotional skill: curiosity.

1.1. Career exploration

Career exploration is a complex psychological process of exploration of the self and the external environment (Jordaan, 1963; Patton and Porfeli, 2007; Porfeli and Lee, 2012) that ensures career adaptability (Blustein, 1997; Savickas, 2005; Savickas et al., 2009) and has a particular significance in transitional periods (e.g., basic to secondary education school transition) in which individuals are frequently challenged with new roles (Kalakoski and Nurmi, 1998; Flum and Blustein, 2000; Pryor and Bright, 2011). According to Super et al. (1996), during the life stage of exploration, adolescents' main tasks include narrowing occupational choices, formulating career goals, and implementing career plans. More recently, in career self-management model (CSM, Lent and Brown, 2013; Lent et al., 2016), it is hypothesized that exploratory actions contribute directly to various career outcomes, such as career decidedness or perceived employability (e.g., Kleine et al., 2021). Also, according to this model, the exercise of adaptive career behaviors (e.g., engaging in career exploration) is assumed to be affected (directly and indirectly) by the individual cognitive variables (e.g., career goals, expectations) and environmental supports and barriers. Highlighting the role of self-management in the career exploration process, the CSM model (Lent and Brown, 2013) aims to explain the conditions that predict the use of adaptive career behaviors (such as career exploration), that individuals use to manage their career development and to cope with career-related challenges (Jiang et al., 2019).

For Career Construction Theory (CCT, Savickas, 2013), career exploration is considered a coping behavior in the structural model of career adaptability. Here, adaptability resources (e.g., curiosity) may play a self-regulator role that can enable the individual to explore relevant career information (coping behavior) and consequently adapt and cope with expected and unexpected career transitions. On the other hand, career exploration is also described as a process that integrates self-determination mechanisms (e.g., socio-emotional skills), into career development (Blustein, 1988; Flum and Blustein, 2000; Flum, 2015). Thus, by considering socioemotional skills as antecedents of career exploration we can better understand how young people regulate their behaviors as they incorporate information from the world around them and evaluate their learning and occupational life experiences. In sum, career exploration emerges as a critical ingredient in adolescents' career development as it raises individuals' awareness of their career options and how their interests, values and aspirations relate with the world of work (Jiang et al., 2019). Additionally, empirical evidence suggests that career exploration promotes coherent career plans and facilitates the career decision-making process (Creed et al., 2007; Patton and Porfeli, 2007; Kleine et al., 2021; Paixão and Gamboa, 2022).

1.2. Parental support as a contextual antecedent of career exploration

Career literature has consistently highlighted the importance of family in career development on a wide range of vocational processes, such as career exploration (e.g., Whiston and Keller, 2004; Hartung et al., 2005; Kenny and Medvide, 2013). Since career exploration requires a certain openness to the unknown and high levels of self-confidence, we can expect that the quality of parent–child relationships may reduce anxiety and stimulate the search for useful career information. Anchored in developmental-contextual (e.g., Vondracek et al., 1986; Young et al., 2002), relational (e.g., Blustein, 2011; Flum, 2015; Kenny et al., 2018) and social cognitive career models and theories (e.g., Lent et al., 1994), empirical research suggest that parental support, in its multiple dimensions (e.g., emotional support, instrumental support), is associated with higher levels of exploration (e.g., Dietrich et al., 2011; Guan et al., 2015; Estreia et al., 2018; Maftei et al., 2023). Several authors have suggested that the quality of support received in proximal contexts (e.g., parents, teachers, peers) can influence individuals' career exploration (e.g., Whiston and Keller, 2004; Reeve, 2009; Lent and Brown, 2013; Turan et al., 2014; Guan et al., 2015; Rodrigues et al., 2017; Ryan and Deci, 2019). Dietrich and

Kracke (2009) and Dietrich et al. (2011) reported that parental figures are the main source of support considered by adolescents when approaching academic transitions. Specifically, the perception of parents' interest and involvement seems to lead to an increase in the individuals' levels of career exploration. Similar results were found by Guan et al. (2015), in a sample of Chinese university students. Using Social Cognitive Career Theory (Lent et al., 1994), Ginevra et al. (2015) found that both mothers' and fathers' perceptions of support predicted their adolescents' career choice through the mediating effect of the youths' perceptions of parental support. More recently, Estreia et al. (2018) concluded that father emotional support predicts environmental exploration while mother emotional support predicts self-exploration. Taken together, these results underline that perceived parental support has a significant impact on career exploration.

1.3. Parental support as a contextual antecedent of curiosity

As previously mentioned, parents play a central role in career development, as they can foster adolescents' agency in career exploration and decision-making, through multiple shared activities. While the impact of parental support on motivation has been extensively studied (e.g., Katz et al., 2018; Paixão and Gamboa, 2022), it appears that the relation between parental support and development of socio-emotional skills has been less explored (e.g., Di Fabio and Kenny, 2015; Howard and Ferrari, 2021). Socio-emotional skills encompass the ability to recognize and regulate emotions (e.g., Kankaras and Suarez-Alvarez, 2019) and it is through observation and interaction with parents that crucial self-regulatory skills, such as self-efficacy, goal setting ability and socio-emotional skills are often acquired (e.g., Young et al., 1997, 2002). Specifically, it is in the proximal relational contexts, such as the family, that youngsters will progressively develop not only their ability to negotiate and manage conflicts, but also a set of self-regulatory skills, namely and among others: persistence, goal orientation, and curiosity. Therefore, it is important to analyze the extent to which the different facets of parental support can influence the development of curiosity in adolescents.

Considering the strong connection observed between motivation and emotion in explaining behavior across distinct achievement contexts (e.g., Reeve, 2009), it seems reasonable to argue that the same contextual factors that influence motivational processes could also explain the development of socio-emotional skills. Using the conceptual framework of the Self-Determination Theory (SDT, Deci and Ryan, 2000), several empirical studies offer evidence of the impact of parental support on motivation (e.g., Guay et al., 2003; Rodrigues et al., 2017; Katz et al., 2018). Overall, these studies consistently demonstrate that parental support is associated to more self-determined types of motivation and with better performance outcomes, particularly when it fosters autonomy. Conversely, if parental support tends to be characterized by control or lack of involvement, is often associated to less self-determined types of motivation and to poorer performance.

As a socio-emotional skill, curiosity is associated with observation, hypothesis testing, engaging in new learning activities, taking risks, and having a clear and positive orientation towards the future. Consequently, curiosity also improves learning outcomes and provides intrinsic incentives for lifelong self-development (Chernyshenko et al., 2018). In other words, curiosity is associated to the adolescents' openness to new learning experiences and their tolerance to ambiguous and unfamiliar information. Thus, it is expected that strong and secure relationships with parental figures could foster the necessary sense of security and autonomy to explore the unknown. Moreover, it is also assumed that more instrumental parental support (e.g., guidance on "how to do") will facilitate the development of the skills needed to explore and organize the information gathered from distinct sources.

1.4. Curiosity as individual antecedent of career exploration

Based on what was mentioned before, we can conclude that the adjustment to a secondary school course (10th, 11th, and 12th grades) will depend, to some extent, on the quality of the career exploration carried out by the student during basic education (e.g., 8th and 9th grades). This is what makes the career exploration process widely considered as a critical ingredient in the career development of adolescents (e.g., Blustein, 1997; Patton and Porfeli, 2007), especially when considering the career outcomes, it can predict (e.g., vocational identity, adjustment to learning contexts, commitment to career choices). Therefore, it is important to study not only the effect of contextual predictors of exploration, but also the effect of its individual antecedents (Jiang et al., 2019). To this end, we follow the suggestion of authors who advocate for the study of variables related to motivation and emotion in explaining adaptive career behaviors (e.g., Blustein, 1988; Guay et al., 2003; Paixão, 2008; Lent et al., 2016). Indeed, in intentional and goal-directed actions, such as career exploration activities, emotions may have a self-regulatory function in information-seeking behaviors (Young et al., 2002). In this regard, it should be noted that the results observed in the studies by Lee et al. (2016) and, more recently, Gamboa et al. (2021) corroborate the assumptions of Blustein (1988) and Flum and Blustein (2000), who describe exploration as a goal-oriented process. Thus, research is needed to analyze the role of the processes that initiate, cease, sustain, and guide career exploration. In their systematic review, Jiang et al. (2019) identify a set of motivational variables (e.g., goals, self-efficacy, expectations, and intrinsic motivation) and personality variables as individual antecedents of career exploration. Kleine et al. (2021), in a meta-analysis, based on the career self-management model of Lent and Brown (2013), concluded that social cognitive variables and some personality traits (e.g., openness to experience, extraversion, and conscientiousness) are positively associated with career exploration behaviors. Nevertheless, despite the large number of empirical studies analyzed, the works of Jiang et al. (2019) and Kleine et al. (2021) do not make explicit references to the role of socio-emotional skills in career exploration. Generally, there are few studies analyzing the role of social and emotional skills in career development, particularly concerning career exploration (Kidd, 2004; Hartung, 2010, 2011). However, research results have been supporting the association between socio-emotional skills and career behavior. For example, in a study that included 14 parent–child dyads, Young et al. (1997) found evidence of the regulatory role of emotions in the joint construction of career projects. Farnia et al. (2018) observed a significant effect of emotions (positive and negative) on levels of indecisiveness in a

sample of university students. Also, very recently, Santos et al. (2018) found a negative association between lack of occupational information and emotional regulation strategies. Regarding the socio-emotional skill curiosity, it seems to be associated with openness to experience, interest in novelty, and a desire to learn new things. In the conceptual model adopted by the OECD (2021), curiosity relates to openness to experience (Big Five), which is positively correlated with career exploration (particularly self-exploration) (Lee et al., 2016). Curiosity also assumes a central role in individual agency variables being associated to self-determined types of motivation (e.g., Deci and Ryan, 2000; Flum and Blustein, 2000), affecting not only the quantity but also the quality of career exploration (Paixão and Gamboa, 2017, 2022).

In career psychology, curiosity is frequently positioned as an adaptability resource, following the assumptions of CCT (e.g., Savickas and Porfeli, 2012; Savickas, 2013), which means that this concept can be defined as a self-regulatory resource related to the willingness to explore the environment, aiming to acquire information about the self and the outside world (Hirschi et al., 2015). According to Savickas (2013), adaptability resources (attitudes, beliefs, and competencies) refer to the psychosocial strengths that affect self-regulation when coping with career tasks and transitions. Therefore, the adaptive individual is conceptualized as someone that shows curiosity for exploring possible selves and future scenarios (Savickas, 2013). Consequently, career curiosity favors the organization of information that is considered useful to career decision-making and to the adjustment to new learning contexts. For this reason, we can assume that career curiosity prevents unrealism about the world of work as well as inaccurate images of the self. Previous research has shown results that support this. For example, Hirschi et al. (2015) found a positive and significant association between curiosity and career exploration, and Li et al. (2015) showed results of regression analysis that present curiosity as a significant predictor of career exploration. In summary, we can infer that curiosity is positively associated with career exploration.

1.5. Present study and hypothesis

As we have explained before, curiosity can be considered as a malleable construct (Di Fabio and Kenny, 2015; Chernyshenko et al., 2018) suggesting that it may be developed through a set of activities within the family context, such as parent-adolescent career conversations (e.g., Young et al., 1997). Additionally, Self Determination Theory (SDT, Deci and Ryan, 2000) and relational and socio-cognitive approaches to career development (e.g., Young et al., 1996; Blustein and Flum, 1999; Blustein, 2011) advocate that the support provided by the family will help in reducing anxiety and will stimulate the search for new learning experiences (e.g., curiosity). Howard and Ferrari (2021) also support the idea that the development of socio-emotional skills would both support and be supported by the development of competencies in the career domain. Therefore, we can assume that curiosity is a significant component in the relationship between parental support and career exploration.

The first aim of this study was to analyze the relationship between career exploration (self-exploration and environmental exploration) and parental support (instrumental assistance, verbal encouragement, career related modeling, emotional support), and curiosity, respectively. Based on the literature review presented before, we expect to find positive correlations between parental support and career exploration (*H1*), positive correlations between career exploration and curiosity (*H2*), and positive correlations between parental support and curiosity (*H3*). Considering unidirectional links, we expect to find positive influence of parental support on curiosity (*H4*), positive influence of parental support on career exploration (*H5*), and positive influence of curiosity on career exploration (*H6*). Finally, we expect that curiosity (as a socio-emotional skill as a self-regulatory process) can have a mediation role on the relationship between parental support (contextual factors) and career exploration (career adaptative behaviors).

2. Method

2.1. Participants and data collection

We used a sample of 540 students, distributed among 8th ($N = 328$; 60.7%) and 9th grades ($N = 212$; 39.3%), from public schools in southern Portugal. The sample comprises 273 boys (50.6%) and 267 girls (49.4%), aged between 13 and 15 years old (M = 13,72, SD = 0.69). After an initial phase where the study was presented to schools, appropriate informed consent procedures were followed in collecting data including obtaining parents' and school boards' permissions. The administration of the instruments was made by trained coresearchers in a classroom context, with the assistance of the school psychologist. On average, each assessment lasted 20 min. Before starting to fill out the questionnaire, participants were informed about the general topic of the study, the voluntarily character of their participation and confidentiality of their answers was assured.

2.2. Measures

Parental support was assessed with the *Career-Related Parent Support Scale* (CRPSS, Turner et al., 2003; adapt. Gamboa et al., 2021). The CRPSS aims to assess students' perceptions of parental support toward career and educational development along the four sources of self-efficacy expectations proposed by Bandura (1997). This 27 items scale consists of four subscales: 1) Instrumental Support (6 items, e.g., "My parents help me to choose out of school activities that may be useful in my future professional career", 2) Career Modeling (7 items, e.g., "My parents have already shown me where they work"), 3) Verbal Persuasion (5 items, e.g., "My parents praised me for doing my schoolwork well"), and 4) Emotional Support (6 items, e.g., "My parents say they are proud of me when I am successful in school"). Items were rated using a 5-point Likert-type scale, ranging from 1 (strongly disagree) to 5 (strongly agree). The higher the score is, the greater the perceived parental support. The validity and reliability of the scale have already been demonstrated, both in the original version (Turner et al., 2003) and in the Portuguese version (Gamboa et al., 2021). In the present study, the estimates of internal consistency in the subscales varied between 0.81 (Verbal Encouragement) and 0.87 (Emotional Support) and for the entire scale, the value observed was 0.93.

Career exploration was assessed using the Portuguese version of the Career Exploration Survey (CES; Stumpf et al., 1983; adapt.

Taveira, 1997). The CES is a multidimensional self-administered scale with 54 items (Likert-type response format), designed to assess beliefs, processes, and reactions to career exploration. In the present study, we only used the items that compose two processes of career exploration: Self-Exploration (5 items, e.g., "In the last 3 months I reflected on how my past integrates with my future career") and Environmental Exploration (4 items, e.g., "In the last 3 months I went to various career orientation programs"). The validity, reliability, and multidimensionality of the CES have been widely demonstrated in its' different versions. Cronbach's alpha for the Portuguese version ranged from 0.63 to 0.83. Research that used this version found internal consistency values for the two exploration processes used in this study between 0.74 and 0.79 (Paixão and Gamboa, 2017, 2022; Gamboa et al., 2021) and we obtained values of 0.80 for environmental exploration and 0.76 for self-exploration.

Socio-emotional skills were assessed with the Portuguese version of Socio-Emotional Skills Survey (SSES; OECD, 2021), provided by Calouste Gulbenkian Foundation. This survey aims to better understand students' contextual factors (e.g., school, home, community) and characteristics that directly or indirectly influence the development of social and emotional skills. The SSES conceptual framework is based on the OCDE framework (Chernyshenko et al., 2018; Kankaras and Suarez-Alvarez, 2019) and was developed in reference to the 'Big Five Model' (John et al., 2008) that distinguishes 15 skills in five dimensions: 1) Task Performance (self-control, responsibility, persistence), 2) Emotional Regulation (stress resistance, optimism, emotional control), 3) Collaboration (empathy, trust, cooperation), 4) Open-Mindedness (tolerance, curiosity, creativity), 5) Engaging with Others (sociability, assertiveness, energy). In this study, we used Curiosity (from Open-Mindedness dimension) as a skill that represents an interest in ideas and love for learning, understanding and for intellectual exploration. This skill was measured using eight items (e.g., "I like to know how things work") rated on a 5-point Likert-scale. The validity and reliability of the scale have been demonstrated in other studies, reporting Cronbach's alpha that ranged from 0.80 and 0.81 (e.g., Kankaras et al., 2019; Salmela-Aro and Upadyaya, 2020), which is aligned with the value that we found in this study ($\alpha = 0.81$).

2.3. Analysis

In the first step, we computed the means, standard deviations, and correlations among the variables. Secondly, Path analysis was performed in AMOS 28.0 (Amos Development Corporation, FL) with maximum likelihood estimation, to test whether the career related parent support (emotional support, instrumental assistance, career-related modeling, and verbal encouragement) influenced directly and indirectly environmental exploration and self-exploration, through the mediating effect of curiosity. Mediation analysis is a statistical procedure to elucidate the mechanism that intervenes between the independent and outcome variables. It explains how the independent variable, through the intermediate variable or mediator, affects the dependent variable. We assessed significant indirect effects by computing bias-corrected bootstrap intervals in AMOS 28.0 bootstrapping function (2,000 samples) at 95% confidence intervals (CIs95; Preacher and Hayes, 2008). Here, if the CIs 95 of the indirect effect does not include zero, we can consider the existence of mediation effects. Goodness of fit was judged according to the following fit indices: χ^2/df ratio (<3), standardized root mean squared residual (SRMR <0.08), the comparative fit index (CFI > 0.90), the normed fit index (NFI > 0.90), and the root mean square error of approximation (RMSEA <0.08, 95% confidence interval lower and upper limits, hereafter 95% CI [LL, UL]) (Byrne, 2016; Kline, 2016).

3. Results

Table 1 shows means, standard deviations, bivariate correlations, and Cronbach Alphas for the variables in study. The four dimensions of the CRPSS were positively correlated with environmental exploration, self-exploration, and curiosity, being the most highlighted values those observed between Emotional Support and Self-Exploration ($r = 0.47$, $p < 0.01$) and between Emotional Support and Curiosity ($r = 0.44$, $p < 0.01$). Additionally, Curiosity also presented positive correlation with Environmental Exploration ($r = 0.25$, $p < 0.01$) and Self-Exploration ($r = 0.42$, $p < 0.01$).

In the next step, seven t tests revealed significant gender differences only in Curiosity ($t = 2.685$, $p < 0.01$, $d = 0.23$). Specifically, girls ($M = 4.00$; $SD = 0.59$) perceived themselves as more curious than boys ($M = 3.86$; $SD = 0.63$). There was no sign of multicollinearity issues among career support variables as we obtained values of Variance Inflation Factors (VIF) < 10 and Tolerance values >0.10 (Kline, 2016). In the last step, we examined the fit indices for the proposed model, which illustrates the hypothesis in study, and it was not found to fit with the data adequately for all criteria, $\chi^2(1, N = 540) = 133.15$; RMSEA = 0.50; CFI = 0.92; NFI = 0.92; SRMR = 0.07. We analyzed modification indices and standardized residuals to verify any suggestions that could lead to an improvement to the model that also would conceptually make sense. Using a step-by-step approach and checking fit indices after respective modifications we eliminated nonsignificant direct effects (due to their low reliability), and covariate the residual errors of the exploration variables (Byrne, 2016).

The final model (Figure 1) shows good fit to data $\chi^2(3, N = 540) = 1.49$; RMSEA = 0.03; CFI = 0.99; NFI = 0.99; SRMR = 0.01.

The standardized coefficients revealed significant direct effects between Emotional Support and Curiosity ($\beta = 0.30$, $p < 0.01$), Environmental Exploration ($\beta = 0.24$, $p < 0.01$), and Self-exploration ($\beta = 0.44$, $p < 0.01$). Instrumental Assistance emerges as having direct influence on Environmental Exploration ($\beta = 0.20$, $p < 0.01$). Career-Related Modeling also shows significant values to Curiosity ($\beta = 0.12$, $p < 0.01$) and Environmental Exploration ($\beta = 0.11$, $p < 0.05$). The last career related support variable, Verbal Encouragement, seems to be positively associated to higher Curiosity ($\beta = 0.14$, $p < 0.01$), Environmental Exploration ($\beta = -0.19$, $p < 0.01$) and Self-Exploration ($\beta = -0.15$, $p < 0.01$). Additionally, we observed that Curiosity has direct influence on Environmental Exploration ($\beta = 0.10$, $p < 0.05$) as well as on Self-Exploration ($\beta = 0.29$, $p < 0.01$).

We assessed significant indirect effects by computing bias-corrected bootstrap intervals in AMOS 28.0 bootstrapping function (2,000 samples) at 95% confidence intervals (CIs95; Preacher and Hayes, 2008). Here, if the CIs95 of the indirect effect does not include zero, we can consider the existence of mediation effects.

Table 2 summarizes the six significant indirect effects that were found. Curiosity partially mediated the effect of Emotional Support on Environmental Exploration (CI_{95} [0.001, 0.063], $\beta = 0.03$, $p < 0.05$) and

TABLE 1 Descriptive statistics, reliabilities, and correlations of variable ($N = 540$).

	M	SD	1.	2.	3.	4.	5.	6.	7.
1. EM	3.76	0.91	(0.87)						
2. IA	3.66	0.85	0.77**	(0.80)					
3. CRM	4.16	0.76	0.48**	0.50**	(0.83)				
4. VE	4.25	0.75	0.64**	0.62**	0.58**	(0.81)			
5. EE	2.87	1.04	0.37**	0.38**	0.26**	0.20**	(0.80)		
6. SE	3.27	0.93	0.47**	0.39**	0.21**	0.24**	0.57**	(0.76)	
7. Curiosity	3.93	0.61	0.44**	0.40**	0.33**	0.40**	0.25**	0.42**	(0.81)

** $p < 0.01$. Cronbach Alpha for each variable is presented between parentheses. EM, Emotional Support; IA, Instrumental Assistance; CRM, Career-Related; Modeling; VE, Verbal Encouragement; EE, Environmental Exploration; SE, Self-Exploration.

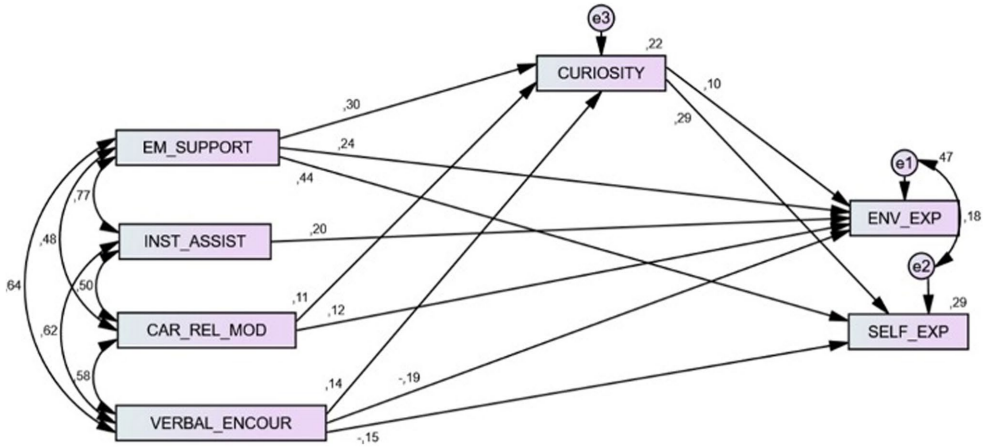


FIGURE 1
Final Model: $\chi^2(3, N=540)=1.49$; RMSEA=0.03; CFI=0.99; NFI=0.99; SRMR=0.01. EM_SUPPORT, Emotional Support; INST_ASSIST, Instrumental Assistance; CAR_REL_MOD, Career-Related Modeling; VERBAL_ENCOUR, Verbal Encouragement; ENV_EXP, Environmental Exploration; SELF_EXP, Self-Exploration.

Self-Exploration (CI_{95} [0.045, 0.135], $\beta=0.09$, $p<0.01$). Concerning the relationship between Career-Related Modeling and career exploration variables, Curiosity partially mediates the effect to Environmental-Exploration (CI_{95} [0.001, 0.031], $\beta=0.01$, $p<0.05$) and fully mediates the effect to Self-Exploration (CI_{95} [0.004, 0.065], $\beta=0.03$, $p<0.05$). Finally, results show partial mediation of Curiosity on the effect of Verbal Encouragement on Environmental Exploration is (CI_{95} [0.001, 0.041], $\beta=0.01$, $p<0.05$) and on Self-Exploration (CI_{95} [0.007, 0.081], $\beta=0.04$, $p<0.05$) was also partially mediated by Curiosity.

Globally, the direct and indirect effects found in the final model explain 29% of the variance of self-exploration and 18% of the variance of environmental exploration.

4. Discussion

The purpose of this study was to analyze how career-related parental support associates to career exploration behaviors (self and environmental) and in which degree curiosity, as a self-regulatory process, mediated the effect of parental support on career exploration, among a group of 8th and 9th grade students. To address our goals, we tested an integrated model through path analysis using AMOS 20.0.

Our correlations analysis allows us to confirm *H1*, given that we can observe positive correlations between both types of career exploration and all dimensions of parental support. These results agree with the results of some empirical studies carried out in the last few years that support the importance of family on enhancing exploration behaviors (e.g., Dietrich et al., 2011; Guan et al., 2015; Estreia et al., 2018; Maftei et al., 2023), especially when approaching school transitions (Dietrich and Kracke, 2009; Dietrich et al., 2011). Our results also reinforce the assumptions of the relational perspectives of career exploration (e.g., Blustein, 1997; Blustein and Flum, 1999), i.e., the support provided by parents promotes adolescents' openness to explore the different courses of secondary education and their feasibility.

Correlational analysis also shows positive associations between curiosity and both types of career exploration, helping to confirm *H2*. These results corroborate studies that support the association between social and emotional skills and career behavior (Young et al., 1997; Farnia et al., 2018; Santos et al., 2018). Meaning, as suggested by Howard and Ferrari (2021), that students' ability to manage their emotions is crucial to their success in the transition and adjustment to secondary school. In addition, these results are also aligned with OECD (2021) framework that considers curiosity as an important socio-emotional skill related to openness to experience, which is often associated to career exploration behaviors (Lee et al., 2016; Kleine et al., 2021). Similarly, Hirschi et al. (2015) and Li et al. (2015) have shown that curiosity has a positive and significant relationship with career exploration, especially with self-exploration. In summary, and in agreement to relational and self-determination perspectives of career development (e.g., Blustein and Flum, 1999), we can conclude

TABLE 2 Bias-corrected bootstrapping test of the mediation effect of curiosity.

Independent Var.	Mediator Var.	Dependent Var.	Estimate	95% Conf. Int.
Emotional support	Curiosity	Environm. Exp.	0.03*	[0.001, 0.063]
		Self-Exploration	0.09**	[0.045, 0.135]
Career-related modeling		Environm. Exp.	0.01*	[0.001, 0.031]
		Self-Exploration	0.03*	[0.004, 0.065]
Verbal encouragement		Environm. Exp.	0.01*	[0.001, 0.041]
		Self-Exploration	0.04*	[0.007, 0.081]

$N = 540$. 95% confidence interval does not include zero.
*$p < 0.05$; **$p < 0.01$.

that the most curious students are also those who are most frequently involved in career exploration activities.

H3 can also be confirmed since we can observe positive associations between all variables of parental support and curiosity. However, by analyzing the direct effects on our final model we can observe that, regarding the four types of parental support, affective and emotional behaviors seem to relate to curiosity more strongly than instrumental behaviors (e.g., instrumental assistance). These results help us to partially confirm *H4* and reinforce that the perceived emotional support provided by the parental figures might be determinant to develop curiosity towards career subjects (Young et al., 1996, 1997; Di Fabio and Kenny, 2015; Chernyshenko et al., 2018). Thus, considering that career decisions are not easy to make during adolescence, we can conclude that curiosity and confidence to explore the self and the world of work has its roots in the security and structure provided by parents.

The results of the final model show that some of the parental support variables positively associate with environmental exploration (emotional support, instrumental assistance, and career-related modeling) and self-exploration (emotional support), but contrary to what we usually find in literature, it suggests a negative effect of verbal encouragement on these two types of exploration. These results allow us to partially confirm *H5*. This effect may be related to the nature and content of the items that compose this dimension of perceived parental support (e.g., item – *my parents encourage me to make good grades*). That is, these students may associate verbal encouragement with greater control and interference from their parental figures (e.g., Boerchi and Tagliabue, 2018) resulting in some inhibition or avoidance to exploration behaviors. In this regard, other studies have expanded the discussion of how important the quality of support in career behaviors can be, stating that a control type of support might be detrimental to adaptive career outcomes (Reeve, 2009; Lent and Brown, 2013; Ryan and Deci, 2019; Paixão and Gamboa, 2022). In addition, instrumental assistance and career-related modeling only associates with environmental exploration. In other words, according to our results, while emotional support helps to answer the question "*Who am I?*" (self-exploration), the more instrumental modalities of support help to answer the question *"What do I want or need?"* (Environmental exploration). From a career development viewpoint, we should underscore that career-related parental support does not have the same effect on the two dimensions of career exploration, as observed in the studies conducted by Estreia et al. (2018) and Rodrigues et al. (2017).

H6 can also be confirmed by the results of the final model. As theoretically expected, curiosity seems to play an important self-regulatory role in adolescents' career transitions (Savickas, 2013). This means that developing this socio-emotional skill can lead to higher levels of career exploration, facilitating the career-decision making process (Creed et al., 2007; Patton and Porfeli, 2007; Kleine et al., 2021; Paixão and Gamboa, 2022).

Lastly, the results partially confirm *H7*, since that curiosity shows up as partial mediator of the relationship between emotional support, career-related modeling and verbal encouragement and environmental exploration and self-exploration. These results are aligned with the career decision-making literature that suggest a relationship between parental support and career adaptive behaviors (e.g., career exploration) and highlight that this relation might be mediated and moderated by self-regulatory processes (e.g., Young et al., 1997; Blustein and Flum, 1999; Guay et al., 2003; Saka and Gati, 2007; Lent et al., 2016; Lipshits-Braziler et al., 2016; Paixão and Gamboa, 2022). In our final model, we can also observe that curiosity fully mediated the effect of career-related modeling on self-exploration. From our point of view, this result underlines the role of curiosity in more distal strategies of information gathering, as will be the case of career-related modeling (e.g., my parents have taken me to their work). In contrast to more proximal strategies, these distal strategies promote greater complexity and cognitive integration in the process of career exploration. Therefore, we can consider that curiosity can, in fact, constitute a main mechanism in the construction of the new meanings (self-exploration) that result from the learning experiences that take place in family and work contexts.

As in previous studies that analyzed the antecedents of career exploration (e.g., Blustein, 1988, 1997; Patton and Porfeli, 2007; Rodrigues et al., 2017; Maftei et al., 2023), in our model the explained variance of self-exploration and environmental exploration is relatively modest. An analysis that included three variables related to parental support and dispositional optimism, the model tested by Maftei et al. (2023) explained 25% of the career exploration variance. In turn, in the study of Guan et al. (2015), with a sample of Chinese university students, parental support explained about 19% of the variance of career exploration, after controlling for the effects of a wide range of sociodemographic variables. Already in 1997, Blustein hypothesized the existence of other factors associated with career exploration that had not yet been properly identified, mainly those of cognitive-motivational nature. In the present study, we expanded the set of variables capable of explaining exploration behaviors, including socio-emotional skills. We only included curiosity, due to the centrality of this skill in the career literature, leaving out other competences that are theoretically relevant in explaining exploration behaviors. Therefore, in future research, the inclusion of a greater number of socio-emotional skills (e.g., adaptability, empathy, assertiveness, optimism, tolerance, responsibility) may increase the explained variance of career exploration behaviors.

5. Theoretical and practical implications

This study offers an important contribution to career literature by showing evidence of the effects of socio-emotional skills, specifically curiosity, on the career exploration behaviors. In fact, despite the relationship between these variables, very few empirical studies present explicit support to these effects. In career domain, socio emotional skills have been widely investigated with an apparent lack of career theoretical frameworks (e.g., Howard and Ferrari, 2021). Our results follow the holistic theories that preconize approaches that integrate simultaneously emotional and career processes (e.g., Young et al., 1996; Hartung, 2011). The tested model helps us to better understand the beneficial effects of socio-emotional skills in career behaviors (e.g., exploration behaviors) and thus contributes to a more integrated view of the relationships observed between emotions and career. Globally, the current article is in line with the substantial research literature that supports the relationship between parental support and career development outcomes (e.g., Ahn et al., 2022; Maftei et al., 2023). Our model incorporated four dimensions of parental support to better explain career exploration and curiosity in accordance with the main propositions of the socio cognitive theory (e.g., Bandura, 1997). Although significantly correlated among each other, in the tested model, the four dimensions of parental support are not identically associated (directly and indirectly) with curiosity and career exploration. Therefore, our results also reinforce the importance of conceptualizing parental support as a multidimensional construct. Also, the mediating effect of curiosity on the relationship between parental support and career exploration leads us to confirm the important role that this socio-emotional skill plays in regulating exploration behaviors and the adjustment to learning and work contexts. We can also draw theoretical implications from this mediation effect. On the one hand, it supports constructivist (e.g., Savickas, 2005) or socio cognitive (e.g., Lent et al., 1994) theories, which consider emotional variables as personal resources that favor agency, self-reflection, and purposeful involvement in vocational tasks. On the other hand, our model also suggests the consolidation of career education models aimed simultaneously at vocational and emotional processes (e.g., Young et al., 1997, 2002; Howard and Ferrari, 2021).

From the point of view of educational policies, the OECD report (2021) argues that in an increasingly turbulent world socio-emotional skills (e.g., curiosity and openness) should be the bedrock of students' well-being and academic achievement. In this sense, we suggest the systematic and intentional incorporation of the development of these competences in the school curriculum.

Regarding practical implications, these findings suggest the importance of considering socio-emotional skills (such as curiosity) in career interventions. Also, it opens the opportunity to progressively extend the participation of proximal contexts (e.g., families) to career development processes, since that these skills can be: 1) enhanced by greater involvement of those who assume an important role on the individual's career choices, especially in complex tasks and transitions (e.g., choosing a secondary school course); and 2) developed through formal and informal learning experiences (e.g., school, household context). In this sense, in addition to information about courses and professions (e.g., instrumental support), parents, teachers and school psychologists must provide the necessary emotional support for curiosity and self-exploration. Our results also suggest that the promotion of curiosity should be considered in career intervention, especially in the more distal modalities of occupational information gathering, for example in internships or job shadowing activities. This is because it is precisely in real work contexts that adolescents can more easily explore the different aspects of their selves, test new roles, and develop social and career skills.

The direct and indirect effects found in our final model show that the model has the capacity to better explain self-exploration (29% of variance explained) than environmental exploration (18% of variance explained). Despite these values not being too expressive, it broadens our knowledge about possible significant predictors of career exploration. For instance, this effort meets the gap that some authors have already identified in the literature (e.g., Blustein, 1988, 1997; Patton and Porfeli, 2007; Jiang et al., 2019; Kleine et al., 2021).

6. Limitations and future research

As our study is cross-sectional, we suggest that future research could use longitudinal designs that allows a more accurate analysis on the development and role of students' socioemotional skills before and after entering secondary school. Additionally, in future research, following the conceptual framework adopted by the OECD, we should consider a broader range of socio-emotional skills and analyze them as mediating and moderating variables. That is, if socio-emotional skills refer to different processes (openness to experience, emotional control) we can expect different effects in career exploration. Considering the gender differences observed for the mediating variable (curiosity), this presents an opportunity to be taken into account and addressed in future research, for example, by studying the moderating role of gender in relations between the studied variables. Finally, a person-centered approach could be helpful to explore the role of socio-emotional skills on career exploration behaviors and on perceived parental support among distinct profiles.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Author contributions

VG designed the study and wrote the first draft of the manuscript. VG, SR, FB, BM, and OP contributed to the study concept and design, discussed the data analyses. All authors contributed to the article and approved the submitted version.

Funding

The work was supported by the Fundação Calouste Gulbenkian, as part of their Gulbenkian Academies of Knowledge initiative, which financed the open access publication fees.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Publisher's note

References

Ahn, J. S., Ratelle, C. F., Plamondon, A., Duchesne, S., and Guay, F. (2022). Testing reciprocal associations between parenting and youth's motivational resources of career decision making agency during the postsecondary transition. *J. Youth Adolesc.* 51, 2396–2410. doi: 10.1007/s10964-022-01672-8

Bandura, A. (1997). *Self-efficacy: The exercise of control*. W.H. Freeman and Company, New York.

Blustein, D. L. (1988). The relationship between motivational processes and career exploration. *J. Vocat. Behav.* 32, 345–357. doi: 10.1016/0001-8791(88)90025-5

Blustein, D. L. (1997). A context-rich perspective of career exploration across the life roles. *Career Dev. Q.* 45, 260–274. doi: 10.1002/j.2161-0045.1997.tb00470.x

Blustein, D. L. (2006). *The psychology of working: A new perspective for career development, counseling, and public policy*. Lawrence Erlbaum Associates Publishers Mahwah, NJ

Blustein, D. L. (2011). A relational theory of working. *J. Vocat. Behav.* 79, 1–17. doi: 10.1016/j.jvb.2010.10.004

Blustein, D. L., and Flum, H. (1999). "A self-determination perspective of interests and exploration in career development" in *Vocational interests: Meaning, measurement, and counseling use*. eds. M. L. Savickas and A. R. Spokane (Mountain View, CA: Davies-Black Publishing), 345–368.

Boerchi, D., and Tagliabue, S. (2018). Assessing students' perception of parental career- related support: development of a new scale and a new taxonomy. *Int. J. Educ. Vocat. Guid.* 18, 181–201. doi: 10.1007/s10775-017-9354-1

Byrne, B. M. (2016). *Structural equation modeling with AMOS: Basic concepts, applications and programming* (*3rd*). Routledge England

Chernyshenko, O. S., Kankaraš, M., and Drasgow, F. (2018). *Social and emotional skills for student success and well-being*. OECD Publishing. Berlin

Creed, P., Patton, W., and Prideaux, L. A. (2007). Predicting change over time in career planning and career exploration for high school students. *J. Adolesc.* 30, 377–392. doi: 10.1016/j.adolescence.2006.04.003

Deci, E. L., and Ryan, R. M. (2000). The "what" and "why" of goal pursuits: human needs and the self-determination of behavior. *Psychol. Inq.* 11, 227–268. doi: 10.1207/S15327965PLI1104_01

Di Fabio, A., and Kenny, M. E. (2015). The contributions of emotional intelligence and social support for adaptive career progress among Italian youth. *J. Career Dev.* 42, 48–59. doi: 10.1177/0894845314533420

Di Fabio, A., Palazzeschi, L., and Bar-On, R. (2012). The role of personality traits, core self-evaluations, and emotional intelligence in career decision-making. *J. Career Assess.* 20, 294–309. doi: 10.1177/1069072712448431

Dietrich, J., and Kracke, B. (2009). Career-specific parental behaviors in adolescents' development. *J. Vocat. Behav.* 75, 109–119. doi: 10.1016/j.jvb.2009.03.005

Dietrich, J., Kracke, B., and Nurmi, J. (2011). Parents role in adolescents' decision on a college major: a weekly diary study. *J. Vocat. Behav.* 79, 134–144. doi: 10.1016/j.jvb.2010.12.003

Estreia, M., Gamboa, V., Rodrigues, S., and Paixão, O. (2018). Suporte parental e autoeficácia nos processos de exploração e de tomada de decisão de carreira. *Revista Psicologia e Educação On- Line* 1, 91–102.

Farnia, F., Nafukho, F. M., and Petrides, K. V. (2018). Predicting career decision-making difficulties: the role of trait emotional intelligence, positive and negative emotions. *Front. Psychol.* 9:1107. doi: 10.3389/fpsyg.2018.01107

Flum, H. (2015). "Relationships and career development: an integrative approach" in *APA handbook of career intervention*. eds. P. J. Hartung, M. L. Savickas and W. B. Walsh, vol. *1* (Washington, DC: American Psychological Association), 145–158.

Flum, H., and Blustein, D. (2000). Reinvigorating the study of vocational exploration: framework for research. *J. Vocat. Behav.* 56, 380–404. doi: 10.1006/jvbe.2000.1721

Gamboa, V., Paixão, M. P., and Jesus, S. N. (2014). Vocational profiles and internship quality among Portuguese VET students. *Int. J. Educ. Vocat. Guid.* 14, 221–244. doi: 10.1007/s10775-014-9268-0

Gamboa, V., Paixão, O., and Rodrigues, S. (2021). Validação da Career-Related Parent Support Scale numa amostra de estudantes portugueses. *Psychologica* 64, 121–140. doi: 10.14195/1647-8606_64-1_6

Germeijs, V., and Verschueren, K. (2007). "Educational choices in adolescence: the decision-making process, antecedents and consequences" in *Career development in childhood and adolescence*. eds. V. Skorikov and W. Patton (Rotterdam: Sense Publishers), 169–180.

Ginevra, M. C., Nota, L., and Ferrari, L. (2015). Parental support in adolescents' career development: Parents' and children's perceptions. *Career Dev. Q.* 63, 2–15. doi: 10.1002/j.2161-0045.2015.00091.x

Guan, Y., Wang, F., Liu, H., Ji, Y., Jia, X., Fang, Z., et al. (2015). Career specific parental behaviors, career exploration and career adaptability: a three-wave investigation among Chinese undergraduates. *J. Vocat. Behav.* 86, 95–103. doi: 10.1016/j.jvb.2014.10.007

Guay, F., Senécal, C., Gauthier, L., and Fernet, C. (2003). Predicting career indecision: a self-determination theory perspective. *J. Couns. Psychol.* 50, 165–177. doi: 10.1037/0022-0167.50.2.165

Hartung, P. J. (2010). Practice and research in career counseling and development—2009. *Career Dev. Q.* 59, 98–142. doi: 10.1002/j.2161-0045.2010.tb00057.x

Hartung, P. J. (2011). Barrier or benefit? Emotion in life-career design. *J. Career Assess.* 19, 296–305. doi: 10.1177/1069072710395536

Hartung, P. J., Porfeli, E. J., and Vondracek, F. W. (2005). Child vocational development: a review and reconsideration. *J. Vocat. Behav.* 66, 385–419. doi: 10.1016/j.jvb.2004.05.006

Hirschi, A., Herrmann, A., and Keller, A. C. (2015). Career adaptivity, adaptability, and adapting: a conceptual and empirical investigation. *J. Vocat. Behav.* 87, 1–10. doi: 10.1016/j.jvb.2014.11.008

Howard, K. A., and Ferrari, L. (2021). Social-emotional learning and career development in elementary settings. *Br. J. Guid. Couns.* 50, 371–385. doi: 10.1080/03069885.2021.1959898

Jiang, Z., Newman, A., Le, H., Presbitero, A., and Zheng, C. (2019). Career exploration: a review and future research agenda. *J. Vocat. Behav.* 110, 338–356. doi: 10.1016/j.jvb.2018.08.008

John, O. P., Naumann, L. P., and Soto, C. J. (2008). "Paradigm shift to the integrative big-five trait taxonomy: history, measurement, and conceptual issues," in *Handbook of personality: theory and research*. Eds. O. P. John, R. W. Robins and L. A. Pervin (New York, NY: Guilford Press), 114–158.

Jordaan, J. P. (1963). "Exploratory behavior: the formation of the self and occupational concepts" in *Career development: SelfConcept theory*. eds. D. Super, R. Starisshevsky, R. Matlin and J. P. Jordaan (Harrisburg, PA: Pennsylvania Department of Education)

Kalakoski, V., and Nurmi, J. E. (1998). Identity and educational transitions: age differences in adolescent exploration and commitment related to education, occupation, and family. *J. Res. Adolesc.* 8, 29–47. doi: 10.1207/s15327795jra0801_2

Kankaras, M., Feron, E., and Renbarger, R. (2019). "Assessing students' social and emotional skills through triangulation of assessment methods" in *OECD education working papers, No. 208* (Berlin: OECD Publishing)

Kankaras, M., and Suarez-Alvarez, J. (2019). "Assessment framework of the OECD study on social and emotional skills" in *OECD education working papers, No. 207* (Berlin: OECD Publishing)

Katz, I., Cohen, R., Green-Cohen, M., and Morsiano-Davidpur, S. (2018). Parental support for adolescents' autonomy while making a first career decision. *Learn. Individ. Differ.* 65, 12–19. doi: 10.1016/j.lindif.2018.05.006

Kenny, M. E., Blustein, D. L., and Meerkins, T. M. (2018). Integrating relational perspectives in career counseling practice. *Career Dev. Q.* 66, 135–148. doi: 10.1002/cdq.12128

Kenny, M., and Medvide, M. B. (2013). "Relational influences on career development" in *Career development and counseling: Putting theory and research to work*. eds. S. D. Brown and R. W. Lent (Hoboken, NJ: Wiley), 329–356.

Kidd, J. M. (2004). Emotion in career contexts: challenges for theory and research. *J. Vocat. Behav.* 64, 441–454. doi: 10.1016/j.jvb.2003.12.009

Kleine, A. K., Schmitt, A., and Wisse, B. (2021). Students' career exploration: a meta-analysis. *J. Vocat. Behav.* 131:103498. doi: 10.1016/j.jvb.2021.103498

Kline, R. B. (2016). *Principles and practice of structural equation modeling* (*4th*). The Guilford Press. New York, NJ

Lee, B., Porfeli, E. J., and Hirschi, A. (2016). Between- and within-person level motivational precursors associated with career exploration. *J. Vocat. Behav.* 92, 125–134. doi: 10.1016/j.jvb.2015.11.009

Lent, R. W., and Brown, S. D. (2013). Social cognitive model of career self-management: toward a unifying view of adaptive career behavior across the life span. *J. Couns. Psychol.* 60, 557–568. doi: 10.1037/a0033446

Lent, R. W., Brown, S. D., and Hackett, G. (1994). Toward a unifying social cognitive theory of career and academic interest, choice, and performance. *J. Vocat. Behav.* 45, 79–122. doi: 10.1006/jvbe.1994.1027

Lent, R. W., Ezeofor, I., Morrison, M. A., Penn, L. T., and Ireland, G. W. (2016). Applying the social cognitive model of career self-management to career exploration and decision-making. *J. Vocat. Behav.* 93, 47–57. doi: 10.1016/j.jvb.2015.12.007

Li, Y., Guan, Y., Wang, F., Zhou, X., Guo, K., Jiang, P., et al. (2015). Big-five personality and BIS/BAS traits as predictors of career exploration: the mediation role of career adaptability. *J. Vocat. Behav.* 89, 39–45. doi: 10.1016/j.jvb.2015.04.006

Lipshits-Braziler, Y., Bamberger, P. A., Feldman, D. C., and Vashdi, D. R. (2016). Career development and counseling for the unemployed: theory and practice implications. *J. Career Assess.* 24, 295–310. doi: 10.1177/1069072715589617

Maftei, A., Mairean, C., and Danila, O. (2023). What can I be when I grow up? Parental support and career exploration among teenagers: the moderating role of dispositional optimism. *Pers. Individ. Differ.* 200:111870. doi: 10.1016/j.paid.2022.111870

OECD (2021). *Beyond academic learning: first results from the survey of social and emotional skills*, OECD Publishing Berlin

Paixão, M. P. (2008). Auto-determinação em contextos de formação e de trabalho: Promoção do desenvolvimento pessoal e da qualidade de vida. *Psicologia e Educação* 7, 15–30.

Paixão, O., and Gamboa, V. (2017). Motivational profiles and career decision making of high school students. *Career Dev. Q.* 65, 207–221. doi: 10.1002/cdq.12093

Paixão, O., and Gamboa, V. (2022). Autonomous versus controlled motivation on career indecision: the mediating effect of career exploration. *J. Career Dev.* 49, 802–815. doi: 10.1177/0894845321992544

Patton, W., and Porfeli, E. (2007). "Career exploration for children and adolescents" in *Career development in childhood and adolescence*. eds. V. Skorikov and W. Patton (Rotterdam: Sense Publishers), 47–69.

Porfeli, E. J., and Lee, B. (2012). *Career development during childhood and adolescence*. New Dir. Youth Dev.

Preacher, K., and Hayes, A. (2008). Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models. *Behav. Res. Methods* 40, 879–891. doi: 10.3758/brm.40.3.879

Pryor, R., and Bright, J. (2011). *The chaos theory of careers: A new perspective on working in the twenty-first century*. Routledge, England.

Reeve, J. (2009). *Understanding motivation and emotion* (*5th*). John Wiley & Sons, Inc. Hoboken, NJ

Rodrigues, S., Gamboa, V., Vieira, L., Paixão, O., and Domingues, D. (2017). Suporte parental e autonomia: Efeitos na exploração e indecisão vocacional. *Revista Interdisciplinar de Ciências e Artes* 7, 41–57. doi: 10.23882/OM07-2017-10-04

Ryan, R. M., and Deci, E. L. (2019). "Brick by brick: the origins, development, and future of self- determination theory" in *Advances in motivation science*. ed. A. J. Elliot, vol. *6* (Amsterdam: Elsevier Inc), 111–156.

Saka, N., and Gati, I. (2007). "Applying decision theory to facilitating adolescent career choices" in *Career development in childhood and adolescence*. eds. V. B. Skorikov and W. Patton (Rotterdam: Sense Publishers), 181–202.

Salmela-Aro, K., and Upadyaya, K. (2020). School engagement and school burnout profiles during high school–the role of socio-emotional skills. *Eur. J. Dev. Psychol.* 17, 943–964. doi: 10.1080/17405629.2020.1785860

Santos, A., Wang, W., and Lewis, J. (2018). Emotional intelligence and career decision-making difficulties: the mediating role of career decision self-efficacy. *J. Vocat. Behav.* 107, 295–309. doi: 10.1016/j.jvb.2018.05.008

Savickas, M. L. (2005). "The theory and practice of career construction" in *Career development and counseling: Putting theory and research to work*. eds. S. D. Brown and R. W. Lent (Hoboken, NJ: John Wiley & Sons, Inc), 42–70.

Savickas, M. L. (2013). "Career construction theory and practice" in *Career development and counseling: Putting theory and research to work*. eds. S. D. Brown and R. W. Lent. *2nd* ed (Wiley.Savickas: Hoboken, NJ), 147–183.

Savickas, M. L., Nota, L., Rossier, J., Dauwalder, J.-P., Duarte, M. E., Guichard, J., et al. (2009). Life designing: a paradigm for career construction in the 21st century. *J. Vocat. Behav.* 75, 239–250. doi: 10.1016/j.jvb.2009.04.004

Savickas, M. L., and Porfeli, E. J. (2012). Career adapt-abilities scale: construction, reliability, and measurement equivalence across 13 countries. *J. Vocat. Behav.* 80, 661–673. doi: 10.1016/j.jvb.2012.01.011

Stumpf, S., Colarelli, S., and Hartman, K. (1983). Development of the career exploration survey (CES). *J. Vocat. Behav.* 22, 191–226. doi: 10.1016/00018791(83)90028-3

Super, D., Savickas, M. L., and Super, C. M. (1996). The life-span, life-space approach to careers. In D. Brown and L. Brooks and Associates (Eds.), *Career choice and development* (pp. 121–178). Jossey-Bass Publishers San Francisco CA.

Taveira, M. C. (1997). *Exploração e desenvolvimento vocacional de jovens: Estudo sobre as relações entre a exploração, a identidade e a indecisão vocacional*. [Unpublished doctoral dissertation] Universidade do Minho, Braga, Portugal.

Turan, E., Çelik, E., and Turan, M. E. (2014). Perceived social support as predictors of adolescents' career exploration. *Aust. J. Career Dev.* 23, 119–124. doi: 10.1177/1038416214535109

Turner, S. L., Alliman-Brissett, A., Lapan, R. T., Udipi, S., and Ergun, D. (2003). The CareerRelated parent support scale. *Meas. Eval. Couns. Dev.* 36, 83–94. doi: 10.1080/07481756.2003.12069084

Vondracek, F. W., Lerner, R. M., and Schulenberg, J. E. (1986). *Career development: A life-span contextual approach to career development*. Hillsdale: Erlbaum.

Whiston, S. C., and Keller, B. K. (2004). The influences of the family of origin on career development: a review and analysis. *Couns. Psychol.* 32, 493–568. doi: 10.1177/0011000004265660

Young, R. A., Paseluikho, M. A., and Valach, L. (1997). The role of emotion in the construction of career in parent-adolescent conversations. *J. Couns. Dev.* 76, 36–44. doi: 10.1002/j.1556-6676.1997.tb02374.x

Young, R. A., Valach, L., and Collin, A. (1996). "A contextualist explanation of career" in *Career choice and development*. eds. D. Brown, L. Brooks and M. J. Lynam. *3rd* ed (San Francisco: Jossey-Bass), 477–512.

Young, R., Valach, L., and Collin, A. (2002). A contextualist explanation of career. In D. Brown & Associates (Eds.), *Career choice and development* (4th, pp. 206–252). Jossey-Bass San Francisco, CA

frontiers | Frontiers in Psychology

TYPE Original Research
PUBLISHED 01 November 2023
DOI 10.3389/fpsyg.2023.1196457

OPEN ACCESS

EDITED BY
Pedro Rosário,
University of Minho, Portugal

REVIEWED BY
Maura Pilotti,
Prince Mohammad bin Fahd University, Saudi Arabia
Luis Felipe Dias Lopes,
Federal University of Santa Maria, Brazil

*CORRESPONDENCE
Ana Xavier
✉ axavier@upt.pt

RECEIVED 29 March 2023
ACCEPTED 09 October 2023
PUBLISHED 01 November 2023

CITATION
Xavier A, Vagos P, Palmeira L, Menezes P, Patrão B, Mendes SA and Tavares M (2023) The Me and the Us of Emotions: a cluster-randomized controlled trial of the feasibility and efficacy of a compassion-based social–emotional learning program for children. *Front. Psychol.* 14:1196457. doi: 10.3389/fpsyg.2023.1196457

The Me and the Us of Emotions: a cluster-randomized controlled trial of the feasibility and efficacy of a compassion-based social–emotional learning program for children

Ana Xavier[1,2]*, Paula Vagos[2,3], Lara Palmeira[1,2], Paulo Menezes[4], Bruno Patrão[4], Sofia Abreu Mendes[5] and Marta Tavares[6]

[1]Department of Psychology and Education, Portucalense University, Porto, Portugal, [2]Center for Research in Neuropsychology and Cognitive and Behavioral Intervention (CINEICC), University of Coimbra, Coimbra, Portugal, [3]William James Research Center, Departamento de Educação e Psicologia, Universidade de Aveiro, Aveiro, Portugal, [4]Institute of Systems and Robotics (ISR), University of Coimbra, Coimbra, Portugal, [5]Centro de Investigação em Psicologia para o Desenvolvimento, Instituto de Psicologia e Ciências da Educação, Universidade Lusíada Porto, Porto, Portugal, [6]Agrupamento de Escolas de Valadares, Vila Nova de Gaia, Portugal

There are well-established benefits of social and emotional learning (SEL) programs for children within educational contexts. Combining social–emotional skills and compassion abilities has been seldomly done, and it may be valuable at individual and societal levels, for resilient, empathetic, and inclusive societies. This study explored the feasibility and efficacy of a program designed to promote socioemotional and compassion skills in children attending the 3rd and 4th grades, by using in-class dynamics complemented with serious games. This program, named "The Me and the Us of Emotions," is part of the Gulbenkian Knowledge Academies 2020 and consists of 10 group sessions embedded in the school curriculum. Using a cluster-randomized controlled trial design, school classes were allocated to intervention (classes, $n = 8$; children, $n = 163$) and control groups (classes, $n = 6$; children, $n = 132$). During the program, facilitators assessed adherence to the sessions' plan, attendance, dosage (i.e., how many sessions were delivered), and participant responsiveness. Children completed self-report measures of social–emotional skills and emotional climate at pre-, post-intervention, 3-month, and 6-month follow-ups. Results indicate that the program is feasible, with high adherence, high attendance rate, and participant responsiveness. Results also indicate empathy, soothing, and drive feelings to change from pre-intervention to all other assessment moments, for the intervention group only. Moreover, cooperation and threat changed over time for participants in both the control and the intervention groups. The current study offers empirical support for the feasibility and utility of a compassion-based social–emotional learning program on promoting children's empathy, and emotions of soothing and vitality in the school context. Thus, these findings contribute to recent research on the potential added value of compassion practices within an SEL program.

KEYWORDS

social–emotional skills, compassion, clinical trial, children, school setting

1. Introduction

During the last two decades, schools, families, researchers, practitioners, and policymakers have acknowledged the importance of promoting social and emotional skills in school contexts to foster children's cognitive development, mental health, and well-being (Denham et al., 2009; Durlak et al., 2011; Elias et al., 2019; OECD, 2021a,b). These social–emotional competencies in early childhood have been found to be predictive of better academic achievements (Durlak et al., 2011; Domitrovich et al., 2017; Corcoran et al., 2018) and long-term life success (Clarke et al., 2015).

Social–emotional learning (SEL) programs aim to help individuals develop those skills, including self-awareness, self-management, social awareness, relationship skills, and responsible decision-making (Collaborative for Academic, Social and Emotional Learning, 2015). These programs are designed to be integrated into the curriculum of schools and are often offered to whole classes in their classrooms (Gueldner et al., 2020). SEL programs typically involve a combination of experiential strategies, such as role-playing, group discussions, and interactive activities. Regarding core components of SEL programs, identifying one's own and others' feelings is frequently addressed, before preparing children to learn behavioral coping skills (Lawson et al., 2019). Through systematic instruction, socioemotional skills may be taught, modeled, and practiced (Weissberg et al., 2015). The goal is to create a safe and supportive learning environment that allows students to explore and express their emotions, while also learning how to manage them effectively and use these skills as part of their daily repertoire of behaviors (Weissberg et al., 2015).

These positive school climates hold a dynamic interaction with student academic, personal, and social development (Coles, 2015; Berg et al., 2017; Elias et al., 2019). Caring and safeness environments facilitate students' interactions with teachers and peers and provide positive conditions for learning from early childhood (Mondi et al., 2021) to adolescence (Coles, 2015; Osher et al., 2015; Berg et al., 2017). In contrast, threats to physical and psychological safety impair student's emotional and behavioral functioning, as well as their attention and working memory, and can result in academic disengagement, school absenteeism and underachievement (Aronen et al., 2005; Berg et al., 2017; Elias et al., 2019; Cipriano et al., 2021). The training of emotional competencies, encompassing skills such as recognizing, expressing, and managing emotions, establishes a foundation for healthy development (Collaborative for Academic, Social and Emotional Learning, 2015; Berg et al., 2017). It empowers young people to effectively interact with others and navigate their surroundings, cope with stress, foster mental and emotional health, succeed academically, and thrive in both personal and academic realms (Osher et al., 2015). These socioemotional competencies are valuable in academic settings that require problem-solving, language and communication skills, collaboration and teamwork, and academic engagement and motivation. Thus, it is expected that grades and academic functioning (e.g., study skills, and on-task behavior) will also be positively impacted by SEL interventions (Cipriano et al., 2021).

A meta-analysis of universal school-based SEL programs, involving 213 schools from kindergarten through high school, showed that these programs can be effective in improving social and emotional skills, attitudes toward self and others, positive social behavior, and academic performance (e.g., reading or math achievement tests scores and grades), while also reducing conduct problems and internalizing symptoms (Durlak et al., 2011). Additionally, SEL programs have been found to improve students' social skills and to prevent externalizing symptoms and risk behaviors (Sklad et al., 2012). Similarly, another meta-analysis (Taylor et al., 2017) involving 82 studies of SEL programs implemented from kindergarten through high school demonstrated benefits on students' emotional skills, positive attitudes, prosocial behavior (e.g., cooperation), and academic performance (e.g., achievement test scores). Recently, a systematic review and meta-analysis including SEL intervention studies from 53 countries indicate benefits for students, namely increased socioemotional skills, civic attitudes, prosocial behaviors, school functioning, and diminished externalizing behaviors and emotional distress, with large effect sizes; these benefits were found for the whole sample, and so were not particular to any cultural context (Cipriano et al., 2021). SEL programs may additionally impact on scholastic performance. A meta-analysis (Corcoran et al., 2018) indicated that SEL interventions generally have a positive effect on reading and mathematics performance and a smaller effect on science achievement. Also, students who benefit from SEL demonstrated improvement in academic achievement, with a medium effect size (Cipriano et al., 2021).

When focusing on elementary schools, Jones et al. (2017) reviewed 11 SEL programs RCT studies and pointed out ambiguous results, which may be related to the measures that were used. Alternatively, other works indicate the efficacy of SEL programs through RCT in elementary schools (from third to fifth grade). Such gains have also been observed for elementary SEL intervention, with students improving their proficiency in reading, writing and math (Schonfeld et al., 2015). Particularly, the MindUP revealed that children improved in empathy and perspective-taking, and decreased depression symptoms and peer-rated aggression, with moderate effects (Schonert-Reichl et al., 2015). The PATHS shows small effects on social problem-solving (e.g., aggression, externalizing problems), and the reduction of aggressive behavior tends to occur only during the second year of implementation (Crean and Johnson, 2013).

Still, studies investigating the stability of gains in follow-up moments are scarce. One of them found reduced effects of changes after 6 months (Durlak et al., 2011). One meta-analysis conducted by Taylor et al. (2017), which included SEL studies with follow-up periods ranging from 6 months to 18 years, indicated maintained gains with modest effect sizes. Regarding follow-up studies, 11% of studies considered by Cipriano et al. (2021) in their systematic review and meta-analysis did a 6-month assessment after the end of the intervention and results indicated maintained improvements in socioemotional skills, and reductions in externalizing behaviors and emotional distress, with an exception for prosocial behaviors and school functioning (including academic achievement, study skills, and academic performance). Further studies are encouraged and advised to include an assessment of follow-up and quality of implementation (Durlak et al., 2011; Durlak, 2016; Taylor et al., 2017; Gadke et al., 2021).

Another way of framing the ability to manage one's emotions is based on the development of compassion skills. Compassion-based programs for children are designed to help young people develop empathy and understanding towards others, as well as to learn how to manage their own emotions. From an evolutive perspective, humans are inherently social, with the capacity for perspective-taking, compassion, empathy, love, and altruistic behavior (Gilbert, 2005;

Szalavitz and Perry, 2010). These social skills strengthen the connection and attachment within groups. Early warmth and safeness experiences and the continuity of nurturing environments among educational and societal systems are needed to reinforce the human biological ability to be compassionate (Coles, 2015). According to Compassion-Focused Therapy (CFT; Gilbert, 2009, 2014), human motivations to explore the world, compete for resources, and belong to a group are linked to emotions that guide our behaviors. These emotions are grouped into three basic emotion-regulation systems oriented for adaptive functions, namely self-protection and survival (Gilbert, 2009, 2014). The threat system is linked to emotions like fear, anger, and disgust, thus helping us quickly identify and respond to threats. The drive-excitement system is linked to emotions of excitement and joy, which motivate and energize us to explore and pursue resources. The soothing-affiliative system is linked to feelings of calmness, contentment, and safeness, and orientates us to give and receive care from others (Gilbert, 2009, 2014). This soothing system plays a crucial role in regulating distress and feeling socially safe and connected (Kirby et al., 2017a). Compassion is rooted in this affiliative system and is defined as a "sensitivity to suffering in self and others with a commitment to try to alleviate and prevent it" (Gilbert and Choden, 2013, p. 94). In fact, empathy and compassion are important components of prosocial behavior (e.g., helping, caring, sharing; Chierchia and Singer, 2016), which can lead to greater peer acceptance and positive interactions in children and adolescents (Cheang et al., 2019). Compassion-based approaches can be effective in producing changes in cooperation, trust, and tolerance (Chierchia and Singer, 2016).

In compassion-based approaches, participants learn how to activate their soothing system, through mindfulness, loving-kindness and compassion meditations, imagery practices, and compassionate letter writing (Gilbert, 2009; Gilbert and Choden, 2013; Neff and Germer, 2013; Gilbert, 2014). The benefits of these practices in a daily base routine include increased self-compassion (Kirschner et al., 2019), empathy or warmth toward others (Klimecki et al., 2014), and social connectedness (Hutcherson et al., 2008). Despite robust evidence of the benefits of compassion-based interventions on well-being in adults (Kirby et al., 2017b), data is only preliminary in young people. For instance, in the *Making Friends with Yourself: A Mindful Self-Compassion Program for Teens* (Bluth et al., 2016), adolescents reported higher levels of self-compassion, life satisfaction, and lower levels of depression after the intervention, in comparison with a waiting list group. Additionally, an online four-week Self-Compassion Program showed that children aged 8–11 years old reported greater self-compassion, positive emotions, and lesser anxiety at the end of the program (Karakasidou et al., 2021). These findings suggest not only that self-compassion training may be applied to younger populations but also encourage universal actions targeting compassion in schools.

Based on the previous evidence on SEL programs and compassion-based interventions, both approaches share similar components, namely the promotion of self-awareness (including emotion identification) and emotional regulation (i.e., coping with difficult emotions), social awareness (including empathy and compassion), and relationship skills (including cooperation, helping, sharing). Despite their shared components, both approaches have not been used complementarily. Thus, the continuous development and implementation of these approaches in a complementing way, for children in school contexts, is still needed to foster positive and cooperative school environments (Coles, 2015; Welford and Langmead, 2015; Elias et al., 2019; OECD, 2021b). Also, there seems to be a paucity of research focusing on the SEL and compassion or kindness programs for children in the first school years, although literature suggests SEL training in early childhood may benefit healthy development (Mondi et al., 2021).

In addition to this complementary approach, a few works have recently integrated serious games as a complement to SEL programs, particularly to promote social skills (Girard et al., 2013; Zheng et al., 2021). Serious games are video games used for educational purposes (e.g., training, knowledge acquisition, skills development; Girard et al., 2013). In this context, serious games help to create an interactive and appealing educational environment, which benefits children by improving their cognitive abilities and positive attitudes toward learning (Lamb et al., 2018; Zhonggen, 2019). Zheng et al. (2021) showed that serious games used as an activity for promoting SEL components (mainly social skills) seem useful when paired with in-person guided discussion. Additionally, the use of serious games seems to be well-accepted as a part of SEL programs. In fact, recent results suggest that children's enjoyment and interest in the subjects addressed in a SEL program was partially explained by the use of serious games (Xavier et al., 2022).

Based on the theoretical principles outlined above concerning the SEL and compassion-focused therapy we design The Me and the Us of Emotion. It was developed based on a complementary approach to those two theoretical frameworks, and resorts to serious games in addition to in-person dynamics. The Me and the Us of Emotions is a universal school program integrated into the Gulbenkian Knowledge Academies 2020; for further detail, please see section 2.4 below. The current study aims to analyze the feasibility and efficacy of The Me and the Us of Emotions, using a cluster-randomized controlled design. These findings may contribute to the widening of empirically supported programs applied in ecological settings that aim to promote emotional well-being in children.

Regarding feasibility, we considered indicators of adherence, attendance, dosage, and participant responsiveness. These indicators were chosen based on Carroll et al.'s (2007), Durlak's (2016), and Gadke et al. (2021) recommendations for good practices in program implementation. As for efficacy, we investigated changes in outcome variables at pre-, post-intervention, 3 and 6-month follow-ups between two groups (one intervention group and one control group). We addressed outcome variables directly related to the goals of The Me and the Us of Emotions. Specifically, we considered three domains of socioemotional skills (i.e., emotional control, empathy, and cooperation) in relation to the programs' intent of promoting skills related to emotion identification, and to understand others' feelings and perspectives. Additionally, we assessed the perception of emotional climate based on the three emotional regulation systems (threat, soothing and drive feelings) because the program addresses emotion regulation skills oriented toward self-reassuring and self-compassion. Based on the previous evidence on SEL programs producing positive effects on social–emotional outcomes (Schonert-Reichl et al., 2015; Jones et al., 2017), we hypothesize that the intervention group, compared with the control group, will display more empathy and cooperation skills, and perceive a more positive emotional climate (particularly, soothing, and drive feelings) throughout the assessment moments.

2. Methods

2.1. Study design

This study is a cluster-randomized controlled trial (cluster RCT) with a random allocation at the school class level. A member of the research team did the random allocation using a computer-based random allocation, and eligible classes were randomly assigned to an intervention or to a control group condition, with a proportion of 43 and 57%, respectively.

2.2. Participants' recruitment and characterization

Figure 1 displays the flow of the recruitment process, considering school classes and participants. At the school class level, inclusion criteria were: (a) classes from 3rd and 4th grades, and (b) classes that had no previous SEL intervention. Furthermore, at the participant level, the inclusion criterium referred to (c) children with no disability that might be an impediment to answering the data collection questionnaires. Thus, children with disabilities were excluded prior to randomization but no classes were excluded for this reason. During the session, these children were given another task by the teacher. A total of 305 children fulfilled these criteria across two public schools located in the same geographical area, for a total of 14 classes. Those children were invited to take part in this research and parental consent was asked. We received parent informed consent from 249 children ($n = 35$ children with no informed consent). Another thirty-one children failed to attend the baseline assessment. After baseline assessment, fourteen school classes were randomized to the intervention group ($N = 8$) or the control group ($N = 6$).

For this study, only data for children who completed all assessment moments was used for the intervention group and the control group. Thus, the final sample was comprised by 164 children aged between 8 and 10 years old (i.e., $n = 89$ for the intervention group and $n = 75$ for the control group). Table 1 presents the sociodemographic characteristics of the final sample. There are no differences in age between groups, $t_{(151.206)} = -1.33$, $p = 0.186$, and no differences in the prevalence of boys and girls across the intervention and control groups, $X^2_{(1)} = 0.96$, $p = 0.326$. The distribution of years of education between groups is marginally significant, $X^2_{(1)} = 3.84$, $p = 0.050$. Urban and rural residence distribution is similar for both groups, $X^2_{(1)} = 0.17$, $p = 0.679$.

2.3. Procedure

Ethical approvals were obtained from the Ethical Committee for Health of the Higher Education institution hosting this research project, after which two public schools in the northern region of Portugal were contacted and asked for collaboration to recruit participants and implement the intervention in the school context. The study was conducted according to the guidelines of the Declaration of Helsinki. Parents or legal guardians were informed about the study's aims and procedures by e-mail and video and gave their informed written consent for data collection. Children enrolled in the study were fully informed about the study's goals and the aspects of confidentiality, and then also gave their written consent to take part of this study. They agreed to voluntarily participate and fill out the instruments in the classroom in the presence of the teacher and of at least one research team member. When necessary, clarification regarding the self-report protocol was provided. The intervention program occurred between January and April 2021 (i.e., between the pre-intervention [T1] and post-intervention [T2] data collection). The 3-month [T3] and 6-month [T4] follow-ups occurred in July and October 2021, respectively.

2.4. Description of The Me and the Us of Emotions program

The Me and the Us of Emotions is a universal program based on the SEL framework (Collaborative for Academic, Social and Emotional Learning, 2015; Gueldner et al., 2020), and compassion-based approaches (Gilbert, 2009, 2014; Bluth, 2017). It was developed by the research team for children in the 3rd and 4th grades and comprises ten manualized developmentally appropriate weekly group sessions, with a duration of 60 min each, to be run in the classroom in the presence of the teacher. Four psychologists with previous training in the program and one clinical psychology master student delivered the group sessions (two facilitators per class). The program was developed to be preferably provided in person but can also be applied online, if necessary, with all activities having been adapted to the online format. Because this study was conducted during the COVID-19 pandemic global crisis, the baseline assessment, the first session and the final four sessions were conducted in person whereas sessions 2 to 6 were delivered online through videoconference.

Table 2 displays a session-by-session overview of the program. The program included the following main components: (a) psychoeducation regarding the universality and adaptive function of emotions; (b) psychoeducation on the different physiological, cognitive, and behavioral components of basic emotions (e.g., joy, sadness, fear, anger) and secondary emotions (e.g., self-reassuring and compassion); (c) self-reassuring and self-compassion exercises to tackle difficult emotions and to enhance children's ability to be kind to themselves; and (d) compassion and cooperative actions to promote collaborative and prosocial behaviors. Experiential exercises and key messages were developmentally adapted or based on pre-existent social–emotional practices with children (e.g., turtle exercise from Webster-Stratton, 1999) and compassion-based approaches (e.g., compassionate touch exercise from Bluth, 2017; safe place meditation and compassionate letter adapted from CFT; Gilbert, 2009). The rationale underlying all sessions is that the practice of socioemotional skills oriented towards self-reassurance and cooperation can be modelled, learned, and practiced, through explicit instruction and/or continuous encouragement (Gilbert, 2009, 2014), and consequently be applied to diverse situations in day-to-day life (Durlak et al., 2011; Weissberg et al., 2015).

The sessions include several action strategies: psychoeducation based on images and videos expressing the daily experiences of two characters built for this intervention; guided reflection and discussion, involving reflection/brainstorming of ideas guided by the facilitator, constructive feedback, and positive reinforcement; active engagement, *via* manual and experiential activities (e.g., exercises in

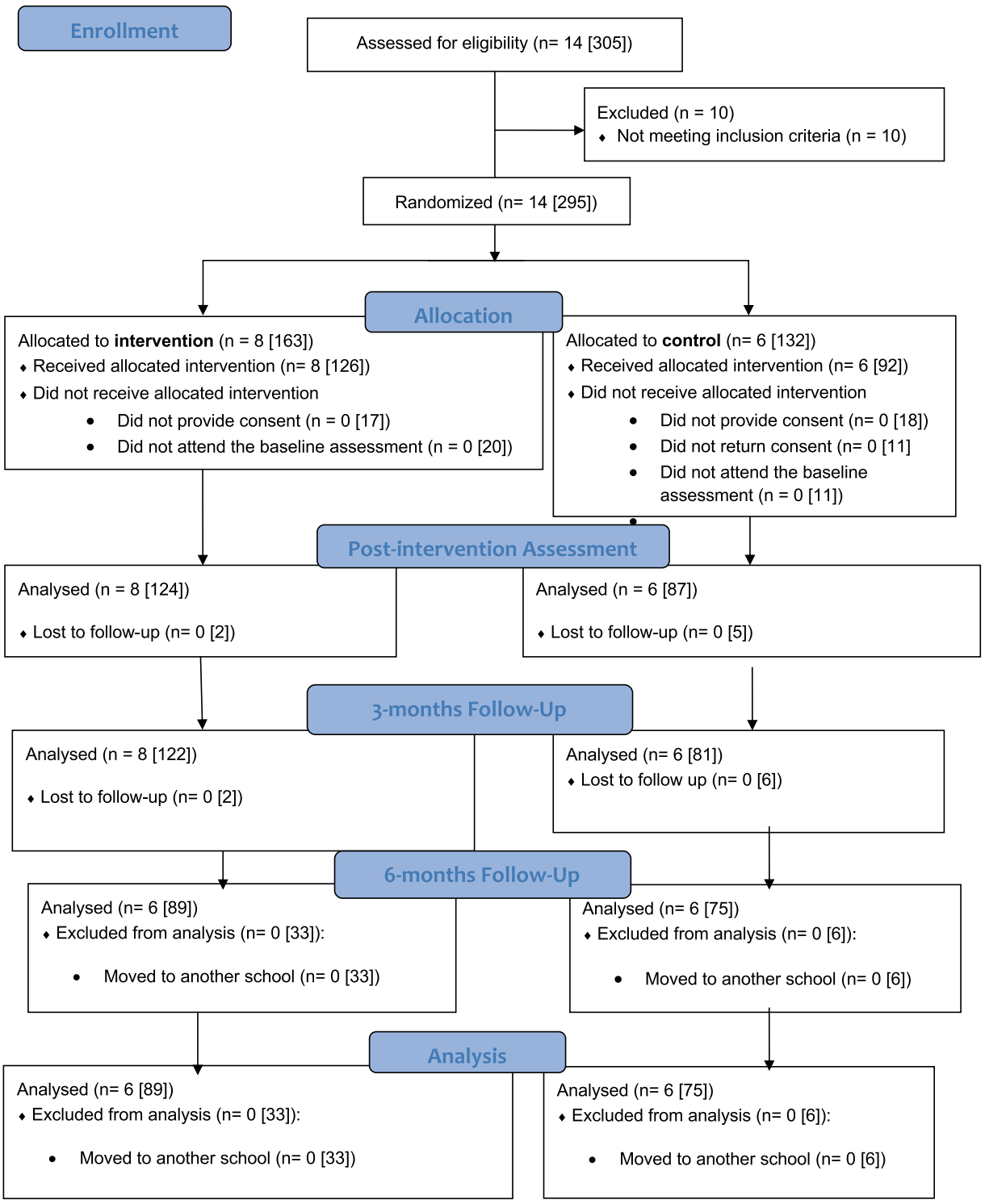


FIGURE 1
The consort flow diagram. Flow of school-classes and children through the study. All numbers are classes [children].

imagery), and the use of serious games addressing the contents of each session. Several sessions (*cf.* Table 2) are supplemented with serious games that use the session's theme to promote emotional identification and effective strategies for dealing with difficult emotions (e.g., sadness, fear, anger). In addition, serious games can be accessed from home and between sessions from the project's web platform.[1] Each session includes suggested activities for the classroom

1 https://emocoes.isr.uc.pt

TABLE 1 Sociodemographic characteristics of participants at 6-month follow-up.

	Intervention group (*n* = 89)	Control group (*n* = 75)	Total sample (*n* = 164)
Gender [n (%)]			
Male	43 (48.3)	42 (56)	85 (51.8)
Female	46 (51.7)	33 (44)	79 (48.2)
Years of education [n (%)]			
3rd Grade	59 (66.3)	60 (80)	119 (72.6)
4th Grade	30 (33.7)	15 (20)	45 (27.4)
Residence [n (%)]			
Urban	58 (86.6)	36 (83.7)	94 (14.5)
Rural	9 (13.4)	7 (16.3)	16 (85.5)
Age [M (SD)]	8.87 (0.66)	8.72 (0.73)	8.80 (0.69)

and home between sessions and for the end of the program (e.g., in the fear session it is suggested drawing activities about real and unreal fears to be exposed in the classroom and interviewing parents about their own fears). These activities were suggested to the class (including teachers and children) at the end of each session. Teachers, as passive observers of the sessions, were invited to remind and encourage children to complete inter-session activities and to take part of a final group-class activity scheduled for after the end of the program implementation.

2.5. Instruments

2.5.1. Demographic characteristics

Sociodemographic data were collected regarding gender, age, academic year, and residence (urban or rural). This information was used the characterize our groups (see above).

2.6. Feasibility measures

The systematic assessment of the intervention implementation was encouraged by the Gulbenkian Knowledge Academies 2020 through periodic meetings and training for the Academies. To guarantee the fidelity of the intervention implementation, the research team provided training (40 h training, with 12 h happening before the beginning of the intervention) and supervision (1 h weekly session) to the facilitators. The research team developed and provided a guided and structured manual that organized and detailed each sessions' plans and explained each activity. Also, all material and digital supports (e.g., power-point of each session, worksheets, serious games) were provided. A monitoring sheet was also provided for the facilitators to complete at the end of each session. Facilitators reported the level of adherence to the session plans, the number of students that attended each session, and the participant's responsiveness. These elements were informative on the feasibility and fidelity of the program implementation, according to Carroll et al.'s (2007), Durlak's (2016), and Gadke et al. (2021) recommendations.

2.6.1. Adherence

This was assessed by the facilitators of the program regarding whether the program was being implemented as it was originally designed. For each session, the facilitator assessed "*how close to the original plan do you think this session was developed in this group?*" according to a 5-point response scale ranging from 1 = *very little* to 5 = *totally*.

2.6.2. Attendance/dosage

This was assessed by the facilitators of the program through the completion of an assiduity sheet, as a measure of how many sessions each participant received.

2.6.3. Participant responsiveness

This was assessed by the facilitators of the program regarding how participants were engaged, involved, or responded to the program (Carroll et al., 2007). Four questions were used: "*How involved were the children in the interactive game?*"; "*How involved in this session do you think the students were?*"; "*How well do you think the students behaved, according to the rules, during the session?*"; "*How supportive and committed to the program was the teacher during the session?*." The facilitators answered each question using a 5-point Likert scale ranging from 1 = *very little* to 5 = *very much*.

2.7. Outcomes measures

Study on social and emotional skills (SSES; OECD, 2019) is a large-scale international survey assessing children and adolescents' social and emotional skills. The Portuguese adaptation is ongoing by the monitoring and assessment team of the Gulbenkian Knowledge Academies 2020. In the present study, three subscales were chosen based on the target age group and on the aims of the intervention. These subscales assessed (i) emotional control (8 items, e.g., "*I keep my emotions under control*"), (ii) empathy (8 items, e.g., "*I care about what happens to others*."), and (iii) cooperation (8 items, e.g., "*I like to help others*"). The participant is asked to answer about the agreement with each item on a 5-point Likert scale, ranging from *strongly disagree* (1) to *strongly agree* (5). Some items are reversed scored. Higher scores indicate higher levels of emotional control, empathy, and cooperation, respectively. In the original version, Cronbach's alphas were 0.74 for emotional control, 0.66 for empathy, and 0.80 for cooperation. In the present study, Cronbach's alphas for pre-intervention were $\alpha \geq 0.71$ for emotion control, $\alpha \geq 0.69$ for empathy, $\alpha \geq 0.82$ for cooperation. For post-intervention, Cronbach's alphas were 0.77, 0.79, and 0.85 for emotional control, empathy, and cooperation subscales, respectively. For the 3-month follow-up, Cronbach's alphas were. 78, 0.77, and 0.85 for emotional control, empathy, and cooperation subscales, respectively. Finally, for the 6-month follow-up, Cronbach's alphas were.82, 0.82, and.86 for emotional control, empathy, and cooperation subscales, respectively.

Emotional climate in the classroom scale – children (ECCS – C; Albuquerque et al., 2019). This self-report measure was developed based on the affect regulation systems model proposed by Gilbert (2009, 2014) and assesses the presence/activation of those three systems, namely threat, drive, and soothing/safeness. This scale was developed for 8 to 12-year-old children using a focus group to improve the readability and clarity of the items' content. It asks children about how they feel in the classroom and to complete 15

TABLE 2 Overview of The Me and the Us of Emotions program session-by-session.

Sessions		Aims	Exercises and practices
1	What are emotions	Establish the group rules and presentation of the participants; Understand the importance and adaptive function of emotions, as well as the universality of emotions.	Group activity of self-presentation promoting shared human condition.
2	Joy	Psychoeducation about the joy emotion on its physiological, cognitive, and behavioral components. Acknowledgment and identification of own's joy and others' joy and behaviors.	Exercise of the recipe of joy. Serious game. Inter-session activities for the classroom (work on identifying the emotion of joy) and home (creating the recipe for family joy).
3	Self-reassuring	Psychoeducation about the self-reassuring emotion on its physiological, cognitive, and behavioral components. Familiarization and training in strategies to promote the emotion of safety/reassurance.	Safe place visualization exercise. Inter-session activities for the classroom (safe place draw) and home (safe family place music).
4	Self-compassion	Acknowledgment and identification of difficult emotions in face of failure and setbacks. Familiarization and training in strategies to promote the emotion of self-compassion.	Exercise of the compassionate touch. Hand drawing exercise with self-compassionate phrases. Inter-session activities for the classroom (exhibition with compassionate phrases) and home (practice the exercise of compassionate touch).
5	Empathy and perspective taking	Promote perspective-taking and empathy skills. Promote the skills of understanding what the other is feeling and knowing how to read the other's emotions.	Exercise of multiple perspectives. Inter-session activities for the classroom and home (stimulating the discovery of multiple perspectives in different contexts).
6	Compassion for Others	Promote cooperative and compassionate behaviors toward others (e.g., offer help, support, and understand). Encourage prosocial behaviors to help alleviate the suffering of the other (e.g., emotionally encourage, hug).	Visual and auditory exercise through video watching of the "hugs song" (by Godinho, 1988). Hangman game. Inter-session activities for the classroom and home (Calendar of Compassionate Actions).
7	Sadness	Psychoeducation about the sadness emotion on its physiological, cognitive, and behavioral components. Promote the normalization of the sadness emotion and the adoption of adaptive strategies to make the sadness emotion less difficult.	Serious game. Inter-session activities for the classroom (designing posters with strategies for dealing with sadness emotion) and home (emotion drawing).
8	Fear	Psychoeducation about the fear emotion on its physiological, cognitive, and behavioral components. Promote the normalization of fear emotion (understand its protective function versus impairment symptoms). Promote the use of strategies to ask for help and to approach unpleasant emotion.	Serious game. Inter-session activities for the classroom (work referring to "true fears and lying fears") and home (interviewing others about their fears).
9	Anger	Psychoeducation about the anger emotion on its physiological, cognitive, and behavioral components. Understand the adaptive function of anger versus externalizing behaviors as disruptive. Familiarization and training in strategies to promote anger regulation.	Turtle technique exercise. Serious game. Inter-session activities for the classroom and home (practicing and teaching the turtle technique).
10	Emotions for Life	Identification of the diverse emotions taggled in the program. Identification and reflection about the gains with the program. Promote the anticipation of circumstances that are likely to provoke unpleasant emotions in the future and the strategies to effectively deal with it.	Serious game. Activities for the classroom (work group about one of the emotions discussed throughout the program and compassionate letter writing for one character of the program) and at home (Compassionate Letter Writing).

items about emotions (such as anger, calm, and active), which represent the three subscales (five items for each type of emotion system). Higher scores indicate higher levels of threat, drive, or soothing/safeness emotions perceived in the classroom. The applicability of this scale to children is under study, but two previous studies with a similar scale for children and adolescents show adequate internal reliability of the measure (Gonçalves, 2019; Henriques, 2019). In the current study, Cronbach's alphas for the combined intervention and control groups at pre-, post-intervention, 3 and 6-month follow-up were 0.64, 0.68, 0.64, 0.65 for threat subscale, 0.71, 0.72, 0.78, 0.80 for soothing subscale, and 0.80, 0.80, 0.83, 0.87 for drive subscale.

2.8. Data analysis

All data analyses were performed using IBM SPSS Statistics for Mac (Version 27.0). The assumption of multivariate normality

was analyzed for outcome variables (i.e., emotional control, empathy, cooperation, threat, soothing, and drive) in all four assessment moments and there was no severe violation of normal distribution (|Sk| < 3 and |Ku| < 8–10; Kline, 2015). To compare groups' scores in our outcome measures across four assessment moments, we performed 2 (condition) × 4 (time) mixed-model ANOVAs to analyze the between-subjects effect of group (intervention group vs. control group), the within-subjects effect of time (pre-intervention, post-intervention, 3-month, and 6-month follow-up), and interaction effects. Levene's test for homogeneity of variances between groups was analyzed. The sphericity assumption for the repeated measures ANOVAs was analyzed through Mauchly's W test. Whenever this assumption was not verified, the Greenhouse–Geisser epsilon ($\varepsilon < 0.75$) was used, which corresponds to a probability correction factor of the F-statistics' significance by adjusting the degrees of freedom (Field, 2013). Eta partial squared was used as a measure of effect size and was interpreted as follows: >0.14 indicates a large effect; >0.06, a medium effect, and > 0.01, a small effect (Cohen, 1992). *Post-hoc* tests using Bonferroni were analyzed for pairwise comparisons.

Missing values were not missing completely at random for items of the Social and Emotional Skills across the four assessment moments for the intervention and control groups, Little MCAR = $X^2_{(2488)} = 3888.08$, $p < 0.001$. Similarly, data were not missing completely at random for items of the Perceived Emotional Climate in Classroom Scale for the intervention and control groups across four assessment moments, Little MCAR $X^2_{(2193)} = 2604.42$, $p < 0.001$. Incomplete data represented 0.59 and 0.79% of the possible data pool and affected 22.28 and 27.16% of participants, respectively. To avoid sample loss, a pairwise deletion approach was used to each individual measure under scrutiny.

3. Results

3.1. The Me and the Us of Emotions' feasibility

3.1.1. Adherence

Results show high levels of adherence (*Min* = 3, *Max* = 5, *M* = 4.81, *SD* = 0.46), meaning that all sessions were at least adequately implementer (i.e., minimum response value of 3), and that, on average, sessions were implemented very close to totally as planned.

3.1.2. Attendance/dosage

All 10 sessions were delivered, and the intervention had a high attendance rate, ranging between 81% in session 6 and 96% in session 8.

3.1.3. Participant responsiveness

Results indicate high levels of engagement in serious games (*Min* = 3, *Max* = 5, *M* = 4.78, *SD* = 0.58) and in the sessions (*Min* = 4, *Max* = 5, *M* = 4.83, *SD* = 0.37). In addition, facilitators indicate that children behaved well in the sessions (*Min* = 2, *Max* = 5, *M* = 4.72, *SD* = 0.60), and teachers, as observers, were highly supportive and committed during the sessions (*Min* = 3, *Max* = 5, *M* = 4.76, *SD* = 0.49).

3.2. Changes in outcome measures, across groups and assessment moments

Descriptive values for all measures across four assessment moments are presented in Table 3, for the complete sample and across groups.

3.3. Change in social–emotional skills

Results for emotional control showed that the main effects of time and group were non-significant, respectively $F_{(2.74,404.86)} = 0.80$, $p = 0.49$; $F_{(1,148)} = 1.61$, $p = 0.21$. Similarly, the interaction effect was not statistically significant, $F_{(2.74, 404.86)} = 0.56$, $p = 0.63$.

For empathy, results showed a significant main effect of time, $F_{(2.81, 398.69)} = 6.99$, $p < 0.001$, $\eta_p^2 = 0.047$, with a medium effect size. Both the main effect of group, $F_{(1, 142)} = 1.24$, $p = 0.27$, and the interaction effect were not statistically significant, $F_{(2.81, 398.69)} = 1.03$, $p = 0.38$. Pairwise comparisons indicated significant differences for the intervention group only (and not for the control group, all *p*s > 0.49). Differences were located from pre-intervention in relation to all other assessment moments (i.e., $p = 005$ for post-intervention, $p = 001$ for 3-month follow-up, and $p = 0.023$ for 6-month follow-up). Participants in the intervention group reported more empathy at post-intervention and follow-ups, in comparison with the pre-intervention assessment (*cf.* Table 3).

For cooperation, results indicated a significant main effect of time, $F_{(3,453)} = 3.55$, $p = 0.015$, $\eta_p^2 = 0.023$, with a medium effect size. Both the main effect of group, $F_{(1, 151)} = 0.88$, $p = 0.35$, and the interaction effect of time and group were not statistically significant, $F_{(3,453)} = 1.59$, $p = 0.197$. On average, all participants reported more cooperation from pre-intervention to 6-month follow-up ($p = 0.034$) (*cf.* Table 3).

3.4. Children's perception of emotional climate

Results indicated a main effect of time, $F_{(3,150)} = 4.21$, $p = 0.006$, $\eta_p^2 = 0.027$, for the threat system with medium effect sizes. The main effect of group, $F_{(3,150)} = 0.75$, $p = 0.39$, and the interaction effect were not statistically significant, $F_{(3,150)} = 0.32$, $p = 0.81$. On average, all participants reported perceiving significantly less threat from post-intervention to six-month follow-up ($p = 0.027$) (*cf.* Table 3).

For the soothing system, results showed a significant main effect of time, $F_{(2.57, 364.21)} = 10.44$, $p < 0.001$, $\eta_p^2 = 0.068$, with a medium effect size. No significant main effect of group, $F_{(1,142)} = 0.25$, $p = 0.62$, and no significant interaction effect were found, $F_{(2.57, 364.21)} = 0.56$, $p = 0.61$. Pairwise comparisons indicated significant differences for the intervention group only (and not for the control group, all *p*s > 0.10). Differences were located from pre-intervention in relation to all other assessment moments (i.e., $p = 007$ for post-intervention, $p = 002$ for 3-month follow-up, and $p = 0.007$ for 6-month follow-up). Participants in the intervention group perceived more soothing in their classrooms at post-intervention and follow-ups, in comparison with the pre-intervention assessment (*cf.* Table 3).

For the drive system, results showed a significant main effect of time, $F_{(2.55,379.84)} = 29.64$, $p < 0.001$, $\eta_p^2 = 0.061$, with a medium effect size. Both the main effect of group, $F_{(1,149)} = 0.20$, $p = 0.65$, and the interaction

10.3389/fpsyg.2023.1196457

TABLE 3 Descriptive values for outcome measures at pre-intervention and post-intervention for the total sample, the intervention group, and the control group.

	Total sample				Intervention group				Control group			
	Pre	Post	3-month	6-month	Pre	Post	3-month	6-month	Pre	Post	3-month	6-month
Social-emotional skills												
Emotional control	3.46 (0.73)	3.42 (0.81)	3.40 (0.81)	3.46 (0.80)	3.36 (0.68)	3.39 (0.75)	3.37 (0.71)	3.43 (0.69)	3.59 (0.78)	3.47 (0.89)	3.44 (0.94)	3.49 (0.90)
Empathy	3.82 (0.60)	3.99 (0.67)	3.97 (0.66)	3.92 (0.69)	3.79 (0.53)	4.05 (0.62)	3.99 (0.66)	4.01 (0.62)	3.82 (0.69)	3.91 (0.73)	3.93 (0.67)	3.83 (0.76)
Cooperation	4.23 (0.59)	4.33 (0.63)	4.32 (0.61)	4.36 (0.59)	4.23 (0.55)	4.37 (0.56)	4.37 (0.52)	4.37 (0.56)	4.23 (0.65)	4.28 (0.72)	4.25 (0.71)	4.34 (0.63)
Emotional climate												
Threat	1.79 (0.69)	1.96 (0.74)	1.90 (0.67)	1.77 (0.61)	1.84 (0.71)	2.04 (0.78)	1.92 (0.66)	1.83 (0.59)	1.73 (0.66)	1.84 (0.66)	1.86 (0.69)	1.71 (0.62)
Soothing	4.08 (0.78)	4.31 (0.66)	4.31 (0.73)	4.30 (0.71)	4.02 (0.75)	4.29 (0.64)	4.31 (0.73)	4.33 (0.63)	4.16 (0.82)	4.33 (0.69)	4.31 (0.73)	4.28 (0.79)
Drive	3.98 (0.89)	4.25 (0.74)	4.19 (0.76)	4.22 (0.79)	3.94 (0.84)	4.27 (0.72)	4.25 (0.76)	4.24 (0.79)	4.04 (0.96)	4.23 (0.77)	4.11 (0.76)	4.20 (0.79)

Values are presented as M (SD).

effect were not statistically significant, $F_{(2.55,379.84)} = 1.25$, $p = 0.29$. Pairwise comparisons indicated significant differences for the intervention group only (and not for the control group, all $ps > 0.20$). Differences were located from pre-intervention in relation to all other assessment moments (i.e., $p = 003$ for post-intervention, $p = 003$ for 3-month follow-up, and $p < 0.001$ for 6-month follow-up). Participants in the intervention group perceived more drive in their classrooms at post-intervention and follow-ups, in comparison with the pre-intervention assessment (*cf.* Table 3).

4. Discussion

Schools are primordial contexts to promote not only academic learning but also social–emotional skills in children and adolescents (OECD, 2021a,b). Social and emotional skills, such as understanding and managing emotions, dealing with social conflicts effectively, and making responsible decisions, have been shown to influence intra and inter-personal outcomes, namely improved emotional skills, positive attitudes, prosocial behavior, and academic performance, and reduced externalizing and risk behaviors (Durlak et al., 2011; Sklad et al., 2012; Schonert-Reichl et al., 2015; Jones et al., 2017; Taylor et al., 2017). In Portugal, the Gulbenkian Knowledge Academies (Calouste Gulbenkian Foundation, 2023) has been supporting projects aimed to promote adaptability, critical thinking, resilience, creativity, problem-solving, self-regulation, and communication for children and adolescents at diverse institutions (e.g., schools, and local associations). The Me and the Us of Emotions' program falls within those projects and refers to a universal program developed to foster the capacity for emotion recognition; emotional self-regulation focused on reassurance and compassion; and behaviors of social connection and cooperation in children. This intervention was framed within the SEL and compassion-focused theoretical principles, being highly experiential and complemented with the use of serious games. The current study aimed to analyze the feasibility and efficacy of The Me and the Us of Emotions program on socio-emotional skills and children's perception of emotional climate, using a cluster-randomized controlled design.

Regarding the feasibility indicators, we intended to contribute to the assessment of the quality of the program's implementation, which is assumed as an essential component related to positive outcomes (Durlak et al., 2011; Durlak, 2016). Still, only a few studies examine the degree to which the program is implemented as planned, even if adherence and participant responsiveness may be predictors of participants' SEL outcomes (Vroom et al., 2019). In addition, recent guidelines for feasibility studies postulate the importance of the acceptability of programs by the target population (Gadke et al., 2021). About The Me and the Us of Emotions, facilitators reported high adherence to the structured plan of the sessions. This may reflect not only an appropriate process of program development that resulted in an easily applied program but also the closeness and continuous monitoring and supervision provided by the research team. The program had a high attendance rate through all 10 sessions. The facilitators assessed the participants' responsiveness with high engagement both in serious games and in the sessions. Additionally, facilitators considered that children behaved well in the sessions, and teachers, as observers, were supportive and committed during the sessions. Taken together, these findings suggest that The Me and the Us of Emotions is a feasible intervention for children and deliverable within the school context.

Regarding changes between groups across assessment moments, we found significant effects of time for social–emotional skills, particularly empathy. Specifically, only children in the intervention group reported increased levels of empathy from pre-intervention to all other assessment moments. Self-reported empathy seemed to have remained stable after the intervention. These results seem to be aligned with the contents of the program that emphasize that all emotions, even the undesirable ones, are helpful for our survival and self-protection and that emotional experience is not our fault and we do not control it, nor do we need to. These findings also align with previous studies focused on follow-up SEL programs, which showed modest results in improving social–emotional skills (Jones et al., 2017; Taylor et al., 2017), despite the well-known benefits for students and educational settings (Durlak et al., 2011; Sklad et al., 2012; Domitrovich et al., 2017; Corcoran et al., 2018). Still, about cooperation, a significant effect of time showed that both the intervention and the control group reported an average increase from pre-intervention to follow-up, which may be associated with the progressing of the school year, as it provides more opportunities for this kind of interaction to occur for all students. This result also aligns with previous findings showing that change in cooperation is more difficult to observe and be maintained over time, specifically following an intervention (Singer and Steinbeis, 2009; Crean and Johnson, 2013).

About the emotion-regulation systems from pre- to post-intervention, exploring the significant effect of time showed that emotions of soothing and drive valences increased from pre- to post-intervention and remained stable at both follow-up assessments, only for the intervention group. Given that the program's sessions addressed basic emotions included in the emotion-regulation systems from CFT (Gilbert, 2009, 2014), namely, joy, sadness, fear, and anger, these results may reflect an increased awareness that children may have acquired about their own emotional experience. This result is in line with previous findings on compassion-based approaches promoting emotional well-being in children and adolescents (Bluth et al., 2016; Karakasidou et al., 2021). On the other hand, threat emotions decreased in both groups from the post-intervention to the 6-month follow-up assessment. It may be the case that students felt more pressure in the middle of the school year, which dissipated over time, particularly if we consider that summer vacation took place between these assessment moments.

4.1. Limitations and future directions

Though current findings are encouraging and relied on sound and highly replicable design, they should be considered within some limitations to be addressed in future studies. Since our sample came from two public schools in the same geographic region, this may limit the generalization of our results. The fidelity indicators we currently used are considered good practice in SEL programs (Carroll et al., 2007; Durlak, 2016), but they were not exhaustive. Although the adherence, attendance/dosage, and participant's responsiveness were assessed, the differentiation and quality of delivery (i.e., what makes a program unique and how the facilitator coach, acts, and models with attitude and enthusiasm the socio-emotional skills; Carroll et al., 2007; Gadke et al., 2021) was not assessed due to the social restrictions arising from the pandemic period. A related limitation is the fact that adherence and participant responsiveness were assessed by the facilitators, who may introduce potential bias by overestimating their level of implementation and students' behaviors. Thus, direct observations in classrooms through independent observers may be valuable in future studies. Despite the direction of the changes between pre- and post-intervention/follow-ups being in line with the expected results for the intervention group and not for the control group, the interaction effects between time and condition were not statistically significant, which precludes robust conclusions. Another limitation was that the program focused on teaching emotion awareness and self-management of emotions, which may not be fully captured by the self-report measures we used because they focus on the emotional climate in the classroom. A better emotional climate may arise from increased self-awareness and self-management of emotions, which were the focus of the intervention program, but these are not overlapping constructs. Future studies should also incorporate additional measures from multi-information sources (e.g., teachers, and parents) about children's social–emotional skills. The program was implemented during a world health crisis (the COVID-19 pandemic) and some sessions were delivered online. Although the online delivery did not affect the attendance/dosage of the program, the threat to human life during that period made emotional management more difficult for everyone, which may have played against the utility of the program in bringing about change. Indeed, mental health difficulties in children (e.g., depression, anxiety, PTSD) increased during the COVID-19 lockdown (Panchal et al., 2021). Additionally, this fact may highlight the importance of promoting social–emotional skills in person in the classroom, as a context for not only modeling those skills but also for improving, *in loco,* social connectedness, and cooperation.

5. Conclusion

Taken together, results from the current study point to the feasibility and, to some extent, the efficacy of a compassion-based socioemotional skills program on fostering children's empathy and soothing and vitality emotions in the school context. These findings concur with the possibility of kindness and compassion being caught, taught, and cultivated in the school context, irrespective of people's age and cultural background (Schonert-Reichl et al., 2012; Coles, 2015; Cayton, 2017). When empathy and compassion attitudes and actions are incorporated into the education system (including students, teachers, staff, and school culture) a dynamic process enfolds that enhances altruism, cohesion, cooperation, and compassion in societies, with benefits for all human beings (Coles, 2015). Additionally, this kind of universal action may promote resilient, healthy, and sustainable human societies, which is aligned with the international guidelines for Sustainable Development Goals (OECD, 2021a,b). As such, it seems warranted that continuous work is devoted to investigating how to better promote these socioemotional regulation skills effectively and from an early age, as was intended by The Me and the Us of Emotions.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Ethics statement

The studies involving humans were approved by Ethical Committee for Health of the Universidade Portucalense Infante D. Henrique, Porto, Portugal. The studies were conducted in accordance with the local legislation and institutional requirements. Written informed consent for participation in this study was provided by the participants' legal guardians/next of kin.

Author contributions

AX, PV, LP, PM, BP, and SM: study conception and design. SM and MT: acquisition of data. AX, PV, and BP: analysis of data. AX, PV, and LP: interpretation of data and drafting of manuscript. All authors contributed to the article and approved the submitted version.

Funding

This research was funded by the Calouste Gulbenkian Foundation, Gulbenkian Knowledge Academies 2020.

Acknowledgments

The authors would like to thank the educational institutions that collaborated with this project, the teachers for their kind participation, and the psychologists (Carla Almeida, Sónia Pereira, Vanessa Rocha, Marisa Moreira) who delivered the sessions of the program.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Publisher's note

References

Albuquerque, I., Matos, M., Cunha, M., Galhardo, A., Palmeira, L., and Lima, M. (2019). *Emotional Climate in the Classroom Scale - Children (ECCS - C)*. Unpublished Instrument. University of Coimbra, Portugal.

Aronen, E. T., Vuontela, V., Steenari, M. R., Salmi, J., and Carlson, S. (2005). Working memory, psychiatric symptoms, and academic performance at school. *Neurobiol. Learn. Mem.* 83, 33–42. doi: 10.1016/j.nlm.2004.06.010

Berg, J., Osher, D., Moroney, D., and Yoder, N. (2017). The Intersection of School Climate and Social and Emotional Development. American Institutes for Research. Available at: https://www.air.org/sites/default/files/downloads/report/Intersection-School-Climate-and-Social-and-Emotional-Development-February-2017.pdf

Bluth, K. (2017). *The Self-Compassion Workbook for Teens: Mindfulness and Compassion Skills to Overcome Self-Criticism and Embrace Who You Are*. Oakland, CA: New Harbinger Publications.

Bluth, K., Gaylord, S. A., Campo, R. A., Mullarkey, M. C., and Hobbs, L. (2016). Making friends with yourself: a mixed methods pilot study of a mindful self-compassion program for adolescents. *Mindfulness* 7, 479–492. doi: 10.1007/s12671-015-0476-6

Calouste Gulbenkian Foundation. (2023). Gulbenkian Programme for Knowledge. Available at: https://gulbenkian.pt/en/initiatives/knowledge-programme/

Carroll, C., Patterson, M., Wood, S., Booth, A., Rick, J., and Balain, S. (2007). A conceptual framework for implementation fidelity. *Implement. Sci.* 2, 1–9. doi: 10.1186/1748-5908-2-40

Cayton, P. (2017). *Compassion in Education: An Introduction to Creating Compassionate Cultures*. London: Foundation for Developing Compassion and Wisdom.

Cheang, R., Gillions, A., and Sparkes, E. (2019). Do mindfulness-based interventions increase empathy and compassion in children and adolescents: a systematic review. *J. Child Fam. Stud.* 28, 1765–1779. doi: 10.1007/s10826-019-01413-9

Chierchia, G., and Singer, T. (2016). "The neuroscience of compassion and empathy and their link to prosocial motivation and behavior" in *Decision Neuroscience: An Integrative Perspective*. eds. J. Dreher and L. Tremblay (London: Elsevier Academic Press), 247–257. doi: 10.1016/B978-0-12-805308-9.00020-8

Cipriano, C., Naples, L. H., Zieher, A., Durlak, J., Eveleigh, A., Funero, M., et al. (2021). The State of Evidence for Social and Emotional Learning: A Contemporary Meta-Analysis of Universal School-Based SEL Interventions. Child Development. Available at: https://osf.io/r246m

Clarke, A. M., Morreale, S., Field, C. A., Hussein, Y., and Barry, M. M. (2015). What Works in Enhancing Social and Emotional Skills Development During Childhood and Adolescence? A Review of the Evidence on the Effectiveness of School-Based and Out-of-School Programmes in the UK. Retrieved from the U.K. Health Promotion Research Centre Website. Available at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/411492/What_works_in_enhancing_social_and_emotional_skills_development_during_childhood_and_adolescence.pdf.

Cohen, J. (1992). Statistical power analysis. *Curr. Dir. Psychol. Sci.* 1, 98–101. doi: 10.1111/1467-8721.ep10768783

Coles, M. I. (Ed.) (2015). *Towards the Compassionate School: From Golden Rule to Golden Thread*. London: Institute of Education Press.

Collaborative for Academic, Social and Emotional Learning (2015). CASEL Guide: Effective Social and Emotional Learning Programs - Middle and High School Edition. Available at: https://pg.casel.org

Corcoran, R. P., Cheung, A. C., Kim, E., and Xie, C. (2018). Effective universal school-based social and emotional learning programs for improving academic achievement: a systematic review and meta-analysis of 50 years of research. *Educ. Res. Rev.* 25, 56–72. doi: 10.1016/j.edurev.2017.12.001

Crean, H. F., and Johnson, D. B. (2013). Promoting alternative thinking strategies (PATHS) and elementary school aged Children's aggression: results from a cluster randomized trial. *Am. J. Community Psychol.* 52, 56–72. doi: 10.1007/s10464-013-9576-4

Denham, S. A., Wyatt, T. M., Bassett, H. H., Echeverria, D., and Knox, S. S. (2009). Assessing social-emotional development in children from a longitudinal perspective. *J. Epidemiol. Community Health* 63, i37–i52. doi: 10.1136/jech.2007.070797

Domitrovich, C. E., Durlak, J. A., Staley, K. C., and Weissberg, R. P. (2017). Social-emotional competence: an essential factor for promoting positive adjustment and reducing risk in school children. *Child Dev.* 88, 408–416. doi: 10.1111/cdev.12739

Durlak, J. A. (2016). Programme implementation in social and emotional learning: basic issues and research findings. *Camb. J. Educ.* 46, 333–345. doi: 10.1080/0305764X.2016.1142504

Durlak, J. A., Weissberg, R. P., Dymnicki, A. B., Taylor, R. D., and Schellinger, K. B. (2011). The impact of enhancing students' social and emotional learning: a meta-analysis of school-based universal interventions. *Child Dev.* 82, 405–432. doi: 10.1111/j.1467-8624.2010.01564.x

Elias, M. J., Brackett, M. A., Miller, R., Jones, S., Kahn, J., Mahoney, J. L., et al. (2019). "Developing social and emotional skills and attitudes and ecological assets" in *Keeping Students Safe and Helping them Thrive: A Collaborative Handbook on School Safety, Mental Health, and Wellness*. eds. D. Osher, M. J. Mayer, R. J. Jagers, K. Kendziora and L. Wood (Praeger/ABC-CLIO: Santa Barbara, CA), 185–209.

Field, A. (2013). *Discovering Statistics Using IBM SPSS Statistics*. London: Sage.

Gadke, D. L., Kratochwill, T. R., and Gettinger, M. (2021). Incorporating feasibility protocols in intervention research. *J. Sch. Psychol.* 84, 1–18. doi: 10.1016/j.jsp.2020.11.004

Gilbert, P. (2005). "Compassion and cruelty: a biopsychosocial approach" in *Conceptualisations, Research and Use in Psychotherapy*. ed. P. Gilbert (London: Routledge), 9–74.

Gilbert, P. (2009). *The Compassionate Mind: A New Approach to Life's Challenges*. Constable & Robinson, London.

Gilbert, P. (2014). The origins and nature of compassion focused therapy. *Br. J. Clin. Psychol.* 53, 6–41. doi: 10.1111/bjc.12043

Gilbert, P., and Choden, K (2013). *Mindful Compassion*. Constable & Robinson, London, UK.

Girard, C., Ecalle, J., and Magnan, A. (2013). Serious games as new educational tools: how effective are they? A meta-analysis of recent studies. *J. Comput. Assist. Learn.* 29, 207–219. doi: 10.1111/j.1365-2729.2012.00489.x

Godinho, S. (1988). *Canção dos Abraços [Song]. On Canta com os amigos do Gaspar [Sing with the Gaspar's Friends]*. Portugal: Universal Music Portugal.

Gonçalves, D. R. O. (2019). *Estudo Piloto de um Programa de Promoção de Competências Emocionais em Crianças do 3° ano de Escolaridade. [Pilot Study of a Social-Emotional Program for Children from 3rd Grade]. Master's Thesis*. Universidade Portucalense, Portugal.

Gueldner, B. A., Feuerborn, L. L., and Merrell, K. W. (2020). *Social and Emotional Learning in the Classroom: Promoting Mental Health and Academic Success*. London: Guilford Publications.

Henriques, A. (2019). *Avaliação do Clima Emocional na Sala de Aula: desenvolvimento e validação de um novo instrumento para adolescentes. [Assessment of the Emotional Climate in the Classroom: Development and Validation of a New Scale for Adolescents]. Master's Thesis*. Instituto Superior Miguel Torga, Coimbra, Portugal.

Hutcherson, C. A., Seppala, E. M., and Gross, J. J. (2008). Loving-kindness meditation increases social connectedness. *Emotion* 8, 720–724. doi: 10.1037/a0013237

Jones, S. M., Barnes, S. P., Bailey, R., and Doolittle, E. J. (2017). Promoting social and emotional competencies in elementary school. *Futur. Child.* 27, 49–72. doi: 10.1353/foc.2017.0003

Karakasidou, E., Raftopoulou, G., and Stalikas, A. (2021). A self-compassion intervention program for children in Greece. *Psychology* 12, 1990–2008. doi: 10.4236/psych.2021.1212121

Kirby, J. N., Doty, J. R., Petrocchi, N., and Gilbert, P. (2017a). The current and future role of heart rate variability for assessing and training compassion. *Front. Public Health* 5:40. doi: 10.3389/fpubh.2017.00040

Kirby, J. N., Tellegen, C. L., and Steindl, S. R. (2017b). A meta-analysis of compassion-based interventions: current state of knowledge and future directions. *Behav. Ther.* 48, 778–792. doi: 10.1016/j.beth.2017.06.003

Kirschner, H., Kuyken, W., Wright, K., Roberts, H., Brejcha, C., and Karl, A. (2019). Soothing your heart and feeling connected: a new experimental paradigm to study the benefits of self-compassion. *Clin. Psychol. Sci.* 7, 545–565. doi: 10.1177/2167702618812438

Klimecki, O. M., Leiberg, S., Ricard, M., and Singer, T. (2014). Differential pattern of functional brain plasticity after compassion and empathy training. *Soc. Cogn. Affect. Neurosci.* 9, 873–879. doi: 10.1093/scan/nst060

Kline, R. B. (2015). *Principles and Practice of Structural Equation Modeling. 4th* Edn New York: Guilford Publications.

Lamb, R. L., Annetta, L., Firestone, J., and Etopio, E. (2018). A meta-analysis with examination of moderators of student cognition, affect, and learning outcomes while using serious educational games, serious games, and simulations. *Comput. Hum. Behav.* 80, 158–167. doi: 10.1016/j.chb.2017.10.040

Lawson, G. M., McKenzie, M. E., Becker, K. D., Selby, L., and Hoover, S. A. (2019). The core components of evidence-based social emotional learning programs. *Prev. Sci.* 20, 457–467. doi: 10.1007/s11121-018-0953-y

Mondi, C. F., Giovanelli, A., and Reynolds, A. J. (2021). Fostering socio-emotional learning through early childhood intervention. *Int. J. Child Care Educ. Policy* 15, 1–43. doi: 10.1186/s40723-021-00084-8

Neff, K. D., and Germer, C. K. (2013). A pilot study and randomized controlled trial of the mindful self-compassion program. *J. Clin. Psychol.* 69, 28–44. doi: 10.1002/jclp.21923

OECD (2019). Assessing students' social and emotional skills through triangulation of assessment methods. *OECD Educ. Work. Papers* 208:6. doi: 10.1787/717ad7f2-en

OECD (2021a). *Positive, High-Achieving Students?: What Schools and Teachers Can Do*. OECD Publishing, Paris.

OECD (2021b). *Beyond Academic Learning: First Results from the Survey of Social and Emotional Skills*, OECD Publishing, Paris.

Osher, D., Kidron, Y., DeCandia, C. J., Kendziora, K., and Weissberg, R. (2015). "Interventions to promote safe and supportive school climate" in *Social Influences on Social-Emotional, Motivation, and Cognitive Outcomes in School Contexts*. eds. K. Wentzel and G. Ramani (New York, NY: Taylor Francis).

Panchal, U., Salazar de Pablo, G., Franco, M., Moreno, C., Parellada, M., Arango, C., et al. (2021). The impact of COVID-19 lockdown on child and adolescent mental health: systematic review. *Eur. Child Adolesc. Psychiatry* 32, 1151–1177. doi: 10.1007/s00787-021-01856-w

Schonert-Reichl, K. A., Oberle, E., Lawlor, M. S., Abbott, D., Thomson, K., Oberlander, T. F., et al. (2015). Enhancing cognitive and social–emotional development through a simple-to-administer mindfulness-based school program for elementary school children: a randomized controlled trial. *Dev. Psychol.* 51, 52–66. doi: 10.1037/a0038454

Schonert-Reichl, K. A., Smith, V., Zaidman-Zait, A., and Hertzman, C. (2012). Promoting children's prosocial behaviors in school: impact of the "roots of empathy" program on the social and emotional competence of school-aged children. *Sch. Ment. Heal.* 4, 1–21. doi: 10.1007/s12310-011-9064-7

Schonfeld, D. J., Adams, R. E., Fredstrom, B. K., Weissberg, R. P., Gilman, R., Voyce, C., et al. (2015). Cluster-randomized trial demonstrating impact on academic achievement of elementary social-emotional learning. *Sch. Psychol. Q.* 30, 406–420. doi: 10.1037/spq0000099

Singer, T., and Steinbeis, N. (2009). Differential roles of fairness-and compassion-based motivations for cooperation, defection, and punishment. *Ann. N. Y. Acad. Sci.* 1167, 41–50. doi: 10.1111/j.1749-6632.2009.04733.x

Sklad, M., Diekstra, R., Ritter, M. D., Ben, J., and Gravesteijn, C. (2012). Effectiveness of school-based universal social, emotional, and behavioral programs: do they enhance students' development in the area of skill, behavior, and adjustment? *Psychol. Sch.* 49, 892–909. doi: 10.1002/pits.21641

Szalavitz, M., and Perry, B. D. (2010). *Born for Love: Why Empathy Is Essential--and Endangered*. New York: William Morrow.

Taylor, R. D., Oberle, E., Durlak, J. A., and Weissberg, R. P. (2017). Promoting positive youth development through school-based social and emotional learning interventions: a meta-analysis of follow-up effects. *Child Dev.* 88, 1156–1171. doi: 10.1111/cdev.12864

Vroom, E. B., Massey, O. T., Yampolskaya, S., and Levin, B. L. (2019). The impact of implementation Fidelity on student outcomes in the life skills training program. *Sch. Ment. Health.* 12, 113–123. doi: 10.1007/s12310-019-09333-1

Webster-Stratton, C. (1999). *How to Promote Children's Social and Emotional Competence*. United States: Sage.

Weissberg, R. P., Durlak, J. A., Domitrovich, C. E., and Gullotta, T. P. (2015). "Social and emotional learning: past, present, and future" in *Handbook of Social and Emotional Learning: Research and Practice*. eds. J. A. Durlak, C. E. Domitrovich, R. P. Weissberg and T. P. Gullotta (New York: The Guilford Press), 3–19.

Welford, M., and Langmead, K. (2015). Compassion-based initiatives in educational settings. *Educ. Child Psychol.* 32, 71–80. doi: 10.53841/bpsecp.2015.32.1.71

Xavier, A., Vagos, P., Palmeira, L., Menezes, P., Patrão, B., Pereira, S., et al. (2022). Children's perspectives on using serious games as a complement to promoting their social-emotional skills. *Int. J. Environ. Res. Public Health* 19:9613. doi: 10.3390/ijerph19159613

Zheng, L. R., Oberle, C. M., Hawkes-Robinson, W. A., and Daniau, S. (2021). Serious games as a complementary tool for social skill development in young people: a systematic review of the literature. *Simul. Gaming* 52, 686–714. doi: 10.1177/10468781211031283

Zhonggen, Y. (2019). A meta-analysis of use of serious games in education over a decade. *Int. J. Comput. Games Technol.* 2019, 1–8. doi: 10.1155/2019/4797032

frontiers | Frontiers in Psychology

TYPE Original Research
PUBLISHED 23 November 2023
DOI 10.3389/fpsyg.2023.1220536

OPEN ACCESS

EDITED BY
Jesus de la Fuente,
University of Navarra, Spain

REVIEWED BY
Maura Pilotti,
Prince Mohammad bin Fahd University,
Saudi Arabia
Kevin Hin Wang Chan,
Hong Kong Polytechnic University,
Hong Kong SAR, China

*CORRESPONDENCE
Pedro Rosário
✉ prosario@psi.uminho.pt

RECEIVED 10 May 2023
ACCEPTED 23 October 2023
PUBLISHED 23 November 2023

CITATION
Cunha J, Martins J, Peseta R and Rosário P (2023) A self-regulation intervention conducted by class teachers: impact on elementary students' basic psychological needs and classroom engagement.
Front. Psychol. 14:1220536.
doi: 10.3389/fpsyg.2023.1220536

A self-regulation intervention conducted by class teachers: impact on elementary students' basic psychological needs and classroom engagement

Jennifer Cunha, Juliana Martins, Rafaela Peseta and Pedro Rosário*

Psychology Research Centre, School of Psychology, University of Minho, Braga, Portugal

Literature has reported a decrease in students' engagement throughout schooling, but more worrying, is that elementary students already show signs of disengagement. This data sets the case to develop interventions at this school level. The narrative-based intervention "Yellow Trials and Tribulations" aimed to promote self-regulation has been proven to positively impact elementary students' school engagement. Acknowledging that classroom engagement is expected to be more closely related to learning and achievement than school engagement, the current study aims to extend the research of the mentioned intervention on elementary students' classroom engagement (i.e., behavioral, emotional, cognitive, and agentic dimensions), as well as on basic psychological needs (i.e., perceived autonomy, competence, and relatedness)—an antecedent of students' engagement. The current intervention was implemented by 4th-grade class teachers trained for that purpose and was assessed following a quasi-experimental design with pretest and posttest data collection. Participants were 90 students in the experimental group, and 91 in the comparison group. A multivariate analysis of variance with repeated measures was run for each construct. At the end of the intervention, children in the experimental group reported higher perceived competence and classroom engagement (all dimensions) than their counterparts in the comparison group (small and medium effect sizes were found). No follow-up was conducted to examine whether the intervention effects were long-lasting. Results are expected to support researchers' and educators' efforts to effectively implement the intervention, and maximize its benefits to students. For example, extra efforts could be made to help implementers better respond to students' psychological needs (in this case, perceived autonomy and relatedness), and consequently increase classroom engagement (especially behavioral and emotional engagement, which revealed lower effect sizes).

KEYWORDS

basic psychological needs, classroom engagement, elementary school, narrative-based intervention, self-regulated learning

1 Introduction

Socio-Emotional Learning (SEL) involves a wide range of skills (e.g., self-regulation of emotions, behaviors, and thoughts), with an important role in students' academic learning while facilitating students' engagement and school success (e.g., Cristóvão et al., 2017; Sala et al., 2020). Students' engagement is an important indicator of students' motivation and learning in elementary school, and later in high school (Côté-Lussier and Fitzpatrick, 2016; Estévez et al., 2021). However, recent research reports early signs of low engagement at the elementary school level, which may compromise subsequent learning and academic trajectories (e.g., Archambault and Dupéré, 2017). This data sets the case to develop interventions on this topic as soon as possible to prevent students from falling into a maladaptive academic trajectory (Luo et al., 2009; Skinner et al., 2016). For the purpose of this research; following Reeve (2012), student engagement is defined as students' active involvement in a learning activity, which involves four dimensions as follows: behavioral, emotional, cognitive, and agentic engagement (see the section Engagement: definition and empirical evidence).

Literature provides several examples of school-based interventions with distinct natures, despite all being focused on promoting elementary students' engagement (e.g., academic tasks, behavior monitoring; see Martins et al., 2021). Of the existing interventions, the narrative-based intervention "Yellow Trails and Tribulations" developed by Rosário et al. (2007a,b) aimed to promote self-regulation skills. This intervention has been shown to positively impact students' school engagement (Rosário et al., 2016; Azevedo et al., 2023); however, literature alerts that not all types of school engagement contribute equally to learning and achievement (Skinner and Pitzer, 2012). For example, students' engagement while completing academic tasks is more likely to impact students' academic learning than their engagement in general school activities or initiatives (Skinner et al., 2009). Prior studies using the "Yellow Trails and Tribulations" intervention did not differentiate components of school and classroom engagement (see Rosário et al., 2016; Azevedo et al., 2023), which may have prevented the retrieval of pertinent information to improve specific aspects of students' learning. Moreover, recent qualitative data indicates that students who participated in the narrative-based intervention were perceived by their teachers as being more confident and engaged in class, even the students with low prior achievement (Cunha et al., 2023). This data, despite being limited to teachers' and observers' overall perceptions of the intervention impact, led us to hypothesize that the "Yellow Trails and Tribulations" narrative-based intervention may contribute to satisfying students' psychological needs and increasing classroom engagement. In this context, the current study aims to extend our knowledge of the benefits of this intervention.

Anchored on Self-Determination Theory, the current study examined the impact of the intervention "Yellow Trials and Tribulations" on elementary students' motivational variables (i.e., basic psychological needs satisfaction of perceived autonomy, competence and relatedness) and classroom engagement, through the training of self-regulated learning skills, a component of socio-emotional core skills. Findings are expected to provide granular information on the impact of the intervention, and implications for effective educational practice.

1.1 Theoretical framework of the study

Self-determination Theory (SDT) provides a relevant theoretical framework for the current study. The Basic Psychological Needs Theory is one of the SDT's six mini theories (Deci and Ryan, 2000; Ryan and Deci, 2020). This mini theory postulates perceived autonomy, competence, and relatedness as basic psychological needs universal and innate to individuals (Deci and Ryan, 2000). Autonomy refers to the individual's ability to be responsible for their behaviors while self-regulating them toward an internal locus of causality (e.g., students' willingness to dedicate time and energy to study; Deci and Ryan, 2000; Niemiec and Ryan, 2009). Autonomy is likely to be satisfied when individuals experience choice over their actions, enthusiasm, and appreciation (Skinner and Belmont, 1993; Ryan and Deci, 2020). Perceived competence relates to individuals' ability to perform meaningful assignments in a specific context and experience mastery while completing an academic task (e.g., Deci and Ryan, 2000; Conesa and Duñabeitia, 2021). Individuals who experience positive feedback are likely to satisfy their need for competence (Skinner and Belmont, 1993; Ryan and Deci, 2020). Lastly, relatedness describes the need to create meaningful relations and to connect with others (e.g., quality of the relationship with teachers and peers in the classroom; Skinner and Belmont, 1993; Deci and Ryan, 2000). This need is likely to be satisfied when individuals experience a sense of belongingness, respect, and security (e.g., students who feel that teachers genuinely value and respect their work; Van den Broeck et al., 2016; Ryan and Deci, 2020).

According to literature, this theory advances with a deep and integrated explanation of student functioning, and helps to explain the role of (dis)satisfaction of basic psychological needs as an underlying process of (dis)engagement during learning activities (Deci and Ryan, 2000; Jang et al., 2012, 2016; Reeve, 2012). Students must fulfill their basic psychological needs in order to learn, and function positively in the classroom (e.g., Deci and Ryan, 2000; Reeve, 2012; Reeve and Lee, 2014). SDT sustains that the fulfillment of these basic psychological needs allows an increase in students' autonomous motivation and engagement and an indirect enhancement of academic achievement (Jang et al., 2012). As prior research found, students who fulfill their basic psychological needs in class are more likely to engage in their school learning (Hughes et al., 2008; Niemiec and Ryan, 2009; Reeve, 2012; Schuitema et al., 2016), which positively influences their willingness to acquire knowledge, develop socially and cognitively, experience gratification, and progress in schooling (e.g., Marks, 2000; McClelland et al., 2006).

1.2 Engagement: definition and measures

Student engagement has been studied by researchers and educators for more than three decades (e.g., Martins et al., 2021). This is a multidimensional construct, co-existing various definitions and dimensions at different levels (e.g., school, classroom, curriculum-based activities), which are nested within each other (see Fredricks and McColskey, 2012; Skinner and Pitzer, 2012; Martins et al., 2021). For example, student engagement in school (or simply school engagement), according to Fredricks et al. (2004)—whose conceptualization has reached more consensus among the literature on the topic (see Martins et al., 2021)—is conceptualized as a

three-arm construct encompassing three dimensions: behavioral (e.g., attendance, participation in school activities, effort while forming class activities, doing homework), emotional (i.e., identification and belongingness with school, positive emotional reactions toward school activities, teachers and peers), and cognitive (i.e., students investment in academic activities, use of self-regulatory strategies). All three dimensions comprise indicators of students' engagement in and out of the school. This general level of engagement is essential to prevent school dropout and promote high school graduation (e.g., Skinner and Pitzer, 2012).

On the other hand, student engagement with learning activities occurring in the classroom context (i.e., a more restricted level of engagement also termed classroom engagement), specifically focuses on the engagement processes occurring in the classroom, such as task-related interactions or whole-class discussions (see Jang et al., 2016). According to Reeve (2012), student engagement may be defined as students' active involvement in a learning activity and encompasses four dimensions: (i) behavioral engagement which refers to attention, concentration, effort, and persistence when completing a task; (ii) emotional engagement which concerns emotions that help the execution of the task, such as interest, enjoyment, curiosity, and the absence of emotions likely to impair the task such as anger or frustration; (iii) cognitive engagement which refers to the use of learning strategies (e.g., elaboration) and self-regulatory strategies (e.g., planning), and the search for deep conceptual comprehension of the content acquired; and finally, (iv) agentic engagement which refers to the importance of being dynamic, proactive, inquisitive while contributing to the learning process (e.g., asking questions, expressing opinions, and communicating one's own interests in class discussions). Following Reeve's (2012) conceptualization of student engagement, the emphasis put in a "learning activity" is crucial to concretely identify the focus or the specific event (i.e., class activities) in which the students are engaged.

The specification of the level of engagement is relevant given the differential impact it may have on students' educational paths. For example, a student may be engaged in school-related activities (e.g., participating in extracurricular activities), but not in classroom and content-focused activities (and *vice-versa*). As these levels of engagement differ, it is expected that their influence on students' learning and outcomes would also vary. In this context, Skinner and Pitzer (2012) stated "No matter how many extracurriculars students undertake or how attached they are to school, they will not learn or achieve unless they are constructively engaged with the academic work of the classroom" (pp. 22–23). This means that the level of students' engagement will somehow determine which students' outcome variables would be influenced.

Acknowledging engagement as a multidimensional construct encompassing different levels, researchers have been emphasizing the need to measure all dimensions of engagement according to the theoretical framework of the study and focusing on a specific level (e.g., school or classroom) (Wang et al., 2014; Fredricks et al., 2016; Martins et al., 2021). Engagement can be assessed through various methods (e.g., self-reports, observations, school records, interviews, and experience sampling) that may be used as a single method or combined (Fredricks and McColskey, 2012; Azevedo et al., 2023). The ideal procedure would be to combine methods; however, this can be extremely time and resource-consuming. This aspect acquires more relevance when collecting data with large samples (e.g., students of various schools). Self-report measures, despite some limitations, are suited to collect data with large samples, while being a reliable and valid method to measure learning-related internal processes (Pekrun, 2020), which is the case of student engagement in school and in the classroom (Fredricks and McColskey, 2012).

Prior reviews summarized student engagement measures considering the items, dimensions, levels, and samples used (see Fredricks and McColskey, 2012; Martins et al., 2021). Regarding self-report instruments for elementary students, contrary to literature recommendations, several instruments encompass items of the school and classroom levels (e.g., Student Engagement Instrument, Appleton et al., 2006; School Engagement Measure, Fredricks et al., 2005) or assess just one or two dimensions of classroom engagement (e.g., Engagement vs. Disaffection with Learning, Skinner et al., 2009; Eight-item scale assessing children's classroom engagement behaviors; Pagani et al., 2010). Future studies are expected to overcome these inconsistencies by following a solid theoretical framework and coherently selecting a multidimensional measure of a specific level of engagement.

1.3 How to promote students' engagement?

Acknowledging the importance of engagement and its implications in students' academic path, researchers put their efforts in identifying students' characteristics as well as facilitators (i.e., parents, teachers, peers), practices, and optimal contexts for the promotion of students' engagement in elementary school (see Martins et al., 2021). Not disregarding the importance and the existence of multiple and simultaneous sources of influence (e.g., parents, teachers, peers), prior studies on elementary school have mainly focused on aspects associated to the school environment (e.g., context characteristics) and related micro aspects (e.g., teacher-student relationships and interactions; teachers' practices in class; school-based interventions) to assess its impact on students' engagement (Martins et al., 2021). However, it is important to note that a significant number of the studies addressing engagement have a noninterventional nature, intending to test theories or map relationships between student's and school's variables and engagement (e.g., Hulleman and Barron, 2016; Pino-James et al., 2019). Despite contributing to improve learning about the construct and allowing to draw educational implications for practice; *per se* these noninterventional studies, "do not end up changing practice" (Hulleman and Barron, 2016). In this context, intervention programs emerge as a suited response to promote students' engagement while purposefully implementing some changes in the school setting and class dynamics (Lazowski and Hulleman, 2015). As Lazowski and Hulleman (2015) stated, through classroom interventions, an agent (usually a teacher or researcher) has the opportunity to act intentionally and foster change in students' behaviors, emotions and cognitions in class. According to the literature (see Fredricks et al., 2019; Martins et al., 2021) a considerable number of interventions have been conducted in classrooms to promote student engagement. These interventions with different purposes, address diverse variables (e.g., academic tasks, reading comprehension, behavior monitoring, and teachers' evidenced-based practices), and were delivered in distinct modalities (e.g., in-class instruction, Mullender-Wijnsma et al., 2015; after school

schedule as extra support, Rosário et al., 2016; or in contexts other than schools; Rosário et al., 2017b). Notwithstanding the interventions' specificities, all reported to positively influence some or all dimensions of engagement (Martins et al., 2021). Therefore, school intervention programs (and studies) to promote students' engagement are of great importance. Reasons are twofold. School-based intervention programs (i) allow the selection of relevant facilitators of students' engagement—teachers playing the implementer role (Ryan and Deci, 2020); and (ii) can lead educators and researchers to be one step closer in identifying potential effective educational practices (e.g., suggested in prior empirical studies) and assessing their suitability in meeting students' educational needs (e.g., Pino-James et al., 2019).

Previous studies have also reported the relevance of promoting students' engagement through the training of self-regulation processes (e.g., Fitzpatrick, 2012; Rosário et al., 2016; Azevedo et al., 2023; Martins et al., 2023). According to Zimmerman's (2002) model, self-regulation is a multidimensional construct that refers to the individual's efforts to orchestrate feelings, thoughts, and actions displayed to attain self-set goals. To learn class content and engage in class, students are expected to not only use a set of cognitive strategies (e.g., working memory or problem-solving strategies), but also to be able to focus their attention and inhibit disruptive behaviors, overcoming background constraints (Fitzpatrick, 2012). The use of these strategies and skills as tools to attain goals involves self-regulation and the exercise of willful control over behavior (Fitzpatrick, 2012; Archambault and Dupéré, 2017; Pereira et al., 2021).

1.4 Engagement and self-regulation

Engagement and self-regulation are distinct but intertwined constructs, sharing some characteristics and processes (e.g., students' involvement, focus and participation in academic-related tasks) implicated in students learning (Ben-Eliyahu et al., 2018; Stefansson et al., 2018). Despite being related, both play an independent but complementary role in the promotion of students' effective learning (Cleary and Zimmerman, 2012). According to literature (e.g., Reeve and Tseng, 2011; Ben-Eliyahu et al., 2018), the use of self-regulation learning (SRL) strategies presupposes the existence of some degree of engagement. In other words, to self-regulate their learning, students should be minimally engaged in learning activities (e.g., Reeve and Tseng, 2011) otherwise they would not put any effort into their performance. Therefore, the training on self-regulation may contribute to facilitating students' classroom engagement in a way that while applying behavioral, emotional, and cognitive efforts in classroom tasks, students are simultaneously engaging in these tasks in an active and productive way (Reeve and Tseng, 2011; Ben-Eliyahu et al., 2018). Grounded in this knowledge, providing students with training in SRL strategies seems to be a suitable way to promote the fulfillment of students' basic psychological needs, and engagement.

1.5 Purpose of the study

Elementary school is a critical developmental period for students' learning because students are expected to learn basic skills (e.g., reading and math; Hill et al., 2008) and acquire essential knowledge to ground future learning experiences (Reyna and Brainerd, 2007). In the Portuguese educational system, fourth grade is the last year of elementary school and sets the ground for the transition to middle school. In the Portuguese middle school (fifth to ninth grade), students have 10 subjects with different teachers, the class size increases, the workload is heavier (e.g., more homework assignments), and finally, students are expected to engage in increased autonomous study time (Cleary and Zimmerman, 2004; Wang and Hofkens, 2020; Santos et al., 2021). The transition from elementary to middle school can be challenging for students regarding self-regulation and socialization demands, particularly for those lacking a wide repertoire of SRL strategies helpful to succeed in school (Zimmerman, 2002; Cleary and Zimmerman, 2004; McClelland et al., 2006; Rosário et al., 2016). Moreover, is important to note that students from disadvantaged backgrounds (as are the students of our sample, see context and participants section) are even more vulnerable to the negative effects of the school transition from elementary to middle school (e.g., disengagement; Pendergast et al., 2018).

Supported by prior data stressing that students who self-regulate their learning are prone to be mentally active during the learning process (e.g., Rosário et al., 2010, 2017a; Azevedo et al., 2023), the current study intends to extend our knowledge on the benefits of a narrative-based intervention focused on self-regulated learning, implemented by class teachers. Teachers are suited candidates to implement educational interventions in class (Dignath et al., 2008; Skinner and Pitzer, 2012; Schuitema et al., 2016; Perry et al., 2020). Throughout the intervention, teachers are expected to help students learn SRL strategies and encourage them to use metacognitive skills; for example, helping them set goals to improve class behavior, or select the SRL strategies best suited to improve the quality of their work (Núñez et al., 2022; Tuero et al., 2022). Therefore, due to their closeness to the students' work, teachers may play an active role in promoting student intrinsic motivation and classroom engagement (Reeve, 2012).

Taken all together, it seems relevant to train elementary school teachers to implement SRL interventions and promote students' satisfaction of basic psychological needs and classroom engagement before their transition to middle school. Hence, the present study, following a quasi-experimental design, aims to answer the following research questions: What is the impact of the SRL intervention "Yellow's Trials and Tribulations" (Rosário et al., 2007a,b) on (i) students' basic psychological needs (i.e., autonomy, competence, and relatedness)?, and (ii) classroom engagement (i.e., behavioral, emotional, cognitive and agentic dimensions)? Following literature recommendations (e.g., Wang et al., 2014; Fredricks et al., 2016; Martins et al., 2021), this study (i) is grounded on the solid theoretical framework of SDT, which links students' psychological needs and engagement (Reeve, 2012); and (ii) explores classroom engagement as a multidimensional construct by analyzing the mentioned four dimensions (Reeve and Tseng, 2011; Jang et al., 2016).

Considering the linkages between SRL and students' engagement (e.g., Reeve and Tseng, 2011; Stefansson et al., 2018; Azevedo et al., 2023), and SDT (Reeve, 2012), it is hypothesized that the SRL intervention will benefit students' basic psychological needs (Hypothesis 1) and classroom engagement (Hypothesis 2). Specifically, students in the experimental group are expected to report higher perceived autonomy (Hypothesis 1a), competence (Hypothesis 1b), and relatedness (Hypothesis 1c), as well as behavioral (Hypothesis 2a),

emotional (Hypothesis 2b), cognitive (Hypothesis 2c) and agentic (Hypothesis 2d) classroom engagement than their counterparts in the comparison group.

Findings are expected to: (i) encourage teacher SRL training, (ii) promote the curricular infusion of SRL programs tailored to students' educational needs, and (iii) support researchers' and educators' efforts to provide a classroom environment fostering learning and academically successful experiences.

2 Materials and methods

2.1 Context and participants

The current study was conducted in elementary schools in Portugal, in which the school principal applied for a national funding (Calouste Gulbenkian Foundation)[1] for implementing evidence-based interventions in the communities. In this case, the school principal selected the narrative-based intervention "Yellow Trials and Tribulations" (Rosário et al., 2007a,b) to be implemented in 4th-grade classes. According to the available data from national statistics (PORDATA, 2018; Instituto Nacional de Estatística Censos, 2021), the participating schools are located in a region (i) with a high illiteracy rate, and low rate of a higher education degree, (ii) where individuals are likely to work on the secondary and tertiary sectors with salaries below the national average. Additionally, the school principal described the neighborhood as a "dormitory" harboring families typically showing disengagement from their children's school life. These are relevant indicators of a disadvantaged school neighborhood (see Li and Fischer, 2017).

The assessment of the intervention in the mentioned schools followed qualitative and quantitative approaches. Cunha et al. (2023) explored the implementers' and observers' overall perceptions of the impact of the intervention through the qualitative analysis of the session sheets and their reflection reports about the intervention implementation. The current study examines the impact of the intervention on the participating students' basic psychological needs and classroom engagement, analyzing quantitative data.

Ninety-six students from four 4th-grade classes participated in the intervention, however, pretest and posttest data were only available for 90 students. Hence, the experimental group is comprised of 90 students (53.3% were female, six students did not reveal this data) with ages ranging between eight and 11 years old ($M = 9.27$, SD = 0.52). The teachers of these students implemented the intervention. The teaching experience of implementers (four female teachers) ranged between 24 and 39 years ($M = 28.25$, SD = 8.26). One implementer held postgraduate training.

Following the agreement made with Gulbenkian Knowledge Academies, each applicant institution is responsible for selecting a comparison group to assess the impact of the Reference Methodology used. In this context, the coordinator of the Gulbenkian Knowledge Academy contacted the school principal of a public school district with similar sociodemographic characteristics to enroll as the comparison group. The comparison group is comprised of 91 students (52.7% were female) enrolled in six classes with ages ranging between nine and 12 years old ($M = 9.20$, SD = 0.48).

2.2 Procedure

The current study was approved by the Ethics Committee of the University of Minho and authorized by the Portuguese Ministry of Education. Following the Declaration of Helsinki, the guardians of the students enrolled in the experimental and comparison groups provided written informed consent to their child's participation in the study.

Participants in both groups followed the national curriculum for the fourth-grade. The comparison group did not engage in the intervention and followed the curriculum for the fourth grade as usual. Note: the teachers of the students in this condition were not enrolled in training on SRL strategies. The teachers of the experimental group were enrolled in 50 h b-learning training between September and December 2018. The training included a theoretical part focused on motivation theories and SRL models, followed by a practical one (e.g., simulation of a session). Later, from March to June 2019, the experimental group enrolled in 10 sessions (60 min approximately) on a weekly basis, carried out in the classroom setting.

Data were collected by research assistants in the classroom context. Basic psychological needs and classroom engagement measures were collected prior to the beginning of the intervention (i.e., pretest) and at the end of the program (i.e., posttest). The implementation of the intervention was monitored by the research team through monthly videoconference sessions.

For ethical reasons, in the beginning of the following school year, the research team provided a lecture for the teachers and parents of the comparison group. The lecture was focused on the self-regulated learning processes and motivation, and was delivered through videoconference.

2.2.1 "Yellow's trials and tribulations" narrative-based intervention

The current intervention uses the story "Yellow's Trials and Tribulations" (Rosário et al., 2007b), which narrates the adventures experienced by the colors of the rainbow while searching for their friend Yellow, who disappeared unexpectedly from the Never Ending Forest. The intervention aims to promote elementary children's SRL strategies (e.g., goal setting, time management, and help-seeking; Rosário et al., 2017a; Cunha et al., 2021; Azevedo et al., 2022). Grounded on the social cognitive theory, the authors of the intervention advocate that students' self-regulation and motivation are influenced by the learning environments (Rosário et al., 2007a).

1 The mission of the CGF is to work for a fairer and more sustainable society, improving people's quality of life through art, charity, science, and education. The Foundation develops a vast activity through its own projects or in partnership with other entities providing grants and scholarships to institutions and social organizations. The intervention strategy between 2018 and 2022 comprised three priority areas: social cohesion and integration, sustainability, and knowledge (Calouste Gulbenkian Foundation, 2019). Integrated into the 2018–2022 intervention strategy, in 2018, a new project called GKA emerged. The purpose was to empower children and youth (up to 25 years old) by promoting social and emotional skills not covered in the regular school curriculum, such as adaptability, communication, creative thinking, resilience, problem-solving, and self-regulation (Calouste Gulbenkian Foundation, 2019).

Specifically, the narrative provides students with the opportunity to learn and discuss problem-solving strategies and challenges presented in contexts distinct from theirs. While discussing the story plot and the strategies used by the characters, students are encouraged to transfer the content acquired to their own learning context and life (Rosário et al., 2017a; Azevedo et al., 2022). For example, one of the chapters tells the story of a bird-teacher who encouraged bird-students to fly; "birds do not fly with closed wings," says the bird-teacher. Through the discussion of this metaphor, which is not directly focused on the participating students' school experiences, it is intended to elicit students' reflection about their own behavior, and, simultaneously, instigate students' engagement in non-academic settings and in their regular school activities (e.g., writing a composition, and solving math problems; Rosário et al., 2017a, 2019) by highlighting its relevance to learn effectively.

Throughout the narrative, some of the characters explain the processes of self-regulation, and function as role models (Bandura, 1986). For example, one of the characters of the narrative, the General-Ant, explains how the Ant Army plans, executes and evaluates their movements in the field to carry out food for their pantry in the anthill. To do all this with efficacy, the General-Ant explains that she follows the old tradition of PLEE—the theoretical model used throughout the intervention (see description below).

2.2.2 The SRL model

The theoretical model used in this intervention is the PLEE (i.e., planning, execution, evaluation) cyclical model by Rosário et al. (2010). The PLEE model is based on Zimmerman's cyclical model, which comprises three phases: forethought, performance or volitional control, and self-reflection (Zimmerman, 2002). The forethought phase requires an analysis of tasks and motivational beliefs, which means, the definition of goals, self-efficacy, and orientation toward those same goals. The performance phase, integrates self-control and self-observation skills, which translates into self-instruction, time management, and metacognitive monitoring. Finally, the self-reflection phase comprises self-judgment and self-reaction (see Zimmerman, 2002 for full description).

The three phases of the PLEE model comprise: (i) planning, in which students must think about what they plan to do, how, and when they will do it; and setting a plan for this purpose; (ii) the execution phase is displayed when the plan is put into practice; and (iii) the evaluation phase comprises the efforts to analyze the outputs against the self-set goals. Importantly, each phase of learning informs the subsequent phase, resetting the self-regulated learning cycle (Rosário et al., 2010, 2017a). This model adds a recursive nature to Zimmerman's model. In each of the PLEE phases, individuals are expected to plan, execute, and evaluate their behaviors (e.g., during the planning phase, besides thinking and designing a plan, individuals are expected to set it, and afterward evaluate this plan of action against their self-set goals; Rosário et al., 2010, 2017a).

2.2.3 Session protocol

In the current intervention, each session began with the scenario arrangement, followed by a review of the content delivered in the previous session (i.e., reviewing prior events of the story and lessons learned). Subsequently, participants were invited to read one or two chapters of the book out loud and then explore and discuss the experiences of the rainbow colors as well as the SRL processes underlying them. Finally, there was a practical activity and a take-home message. Supplementary Figure S1 provides an example of a session protocol.

The class discussions of the chapter(s) were grounded on the three types of knowledge: declarative (i.e., What is?), procedural (i.e., How?), and conditional (i.e., When? Where? Why?; Rosário et al., 2017a, 2019). This protocol allowed students to reflect on the narrative as well as on the behaviors, feelings, and accomplishments of the characters, attributing meaning and structure to their learnings while developing prospective applications of these strategies in their daily lives (Rosário et al., 2017a).

2.2.4 Treatment integrity

Treatment or intervention integrity involves several procedures regarding to the adherence to protocol and implementer competence (Perepletchikova, 2011). In the current study, five procedures related to the adherence to protocol were considered: (i) intervention manual (Rosário et al., 2007a), (ii) teachers' training, (iii) session protocol, (iv) session sheets (i.e., checklist of the session structure and white space for notes), and v) monthly practice monitoring by the research team. In the current study, it was not possible to assess the implementers' competence during the intervention implementation.

2.3 Instruments and measures

2.3.1 Personal data

Participants were asked about their gender and age.

2.3.2 Basic psychological needs satisfaction

In order to assess each dimension of the basic psychological needs (i.e., autonomy, competence, and relatedness) items reported in previous studies were used (Reeve and Sickenius, 1994; Jang et al., 2012, 2016). Students answered this measure through a 5-point Likert scale (1 = strongly disagree, 5 = strongly agree; Jang et al., 2016). The autonomy dimension was evaluated through five items (e.g., "In this class, I feel free"; Jang et al., 2016). The competence dimension was evaluated through six items (e.g., "In this class, I feel successful in terms of completing difficult tasks"; Jang et al., 2016). Finally, the relatedness dimension was evaluated through four items (e.g., "I feel a close sense of connection with people in this class"; Jang et al., 2016). Items were originally written in English, therefore, a back translation was made to adapt the measure to the Portuguese context. Then the scale was filled out by a group of five children in order to check for comprehension. These children did not participate in the intervention study. Two items were changed to accommodate the children's understanding. For example, the item "In this class, I feel competent" was changed to "In this class, I feel that I can do the tasks." The scale has shown high internal consistency in previous studies (Jang et al., 2012, 2016). In the present study, the scores on this measure were also internally consistent (i.e., autonomy: $\alpha = 0.75$, competence: $\alpha = 0.83$, relatedness: $\alpha = 0.76$).

2.3.3 Classroom engagement

Classroom engagement was assessed as a multidimensional construct featuring behavioral, emotional, cognitive, and agentic dimensions. Participants answered the 19 items adapted from the engagement measure by Jang et al. (2016) using a 5-point Likert

response scale (1 = strongly disagree, 5 = strongly agree). This measure focuses on students' effort, attention, and commitment when initiating and participating in classroom learning activities as well as on their emotions throughout those activities (Jang et al., 2016). Behavioral, emotional, and agentic dimensions of engagement were assessed with five items each (e.g., "When I'm in this class, I listen very carefully.," "When we work on something in this class, I feel interested.," and "I let my teacher know what I need and want.," respectively), while cognitive engagement was assessed by four items (e.g., "When reading for this class, I try to explain the key concepts in my own words."; Jang et al., 2016). The items were also originally written in English, and a back translation was made to adapt the measure to the Portuguese context. Then the scale was filled out by a group of five children in order to check for comprehension. These children did not participate in the intervention study. Three items were changed to accommodate children's understanding. For example, the item "I let my teacher know what I need and want" was changed to "I let my teacher know what helps me learn." This scale has shown strong psychometric properties in a previous investigation (Jang et al., 2016). In the present study, the scores on this measure were also internally consistent (i.e., behavioral engagement: $\alpha = 0.81$, emotional engagement: $\alpha = 0.82$, cognitive engagement: $\alpha = 0.80$, agentic engagement: $\alpha = 0.77$).

2.4 Data analysis

The present study analyzed the impact of the intervention (i.e., independent variable) on students' basic psychological needs (i.e., dependent variable) and classroom engagement (i.e., dependent variable). Given that the three dimensions of basic psychological needs, as well as the four dimensions of engagement, are interrelated (Ryan and Deci, 2000; Reeve, 2012), a Multivariate Analysis of Variance (MANOVA) was performed for each construct. Since data was collected at two different times (i.e., pretest and posttest) this MANOVA included repeated measures (Field, 2009). Firstly, an exploratory analysis was performed to verify the assumptions required to conduct MANOVA (Field, 2009). The statistical analyses were run using IBM SPSS version 27.0.

The effect size was calculated using the partial eta-squared coefficient (η^2p) as described in Piñeiro et al. (2019). The coefficient values were interpreted through the Cohen (1988) benchmarks: null effect: $\eta^2p < 0.01$ ($d < 0.09$); small effect: $0.01 \leq \eta^2p \leq 0.058$ ($0.10 \leq d \leq 0.49$); medium effect: $0.059 \leq \eta^2p \leq 0.137$ ($0.50 \leq d \leq 0.79$); and large effect: $\eta^2p \geq 0.138$ ($d \geq 0.80$).

3 Results

Table 1 provides the descriptive statistics of all dependent variables (i.e., basic psychological needs and engagement dimensions) in the pretest and posttest for the experimental and comparison groups, respectively. Preliminary analyses were conducted to examine whether there were any differences between the two groups at the pretest. No statistically significant differences were found, which allows inferring that differences in the experimental group in the posttest can be due to the intervention.

Tables 2, 3 display the correlations between the dependent variables for the experimental and comparison group, respectively. Significant Pearson correlation coefficients ranged from 0.207 to 0.798 for the experimental group, and from 0.219 to 0.831 for the comparison group. Pearson correlation coefficients between dimensions of classroom engagement are high (particularly between cognitive and agentic classroom engagement), which may indicate multicollinearity issues (see Abu-Bader, 2010). However, the results of the residuals sums-of-squares and cross-products (SSCP) matrix in MANOVA indicated that correlations are below the benchmark value of 0.80.

Regarding basic psychological needs, results indicate no statistically significant multivariate group effect (Table 4), Wilks' Lambda = 0.991, $F(3, 175) = 0.536$, $p = 0.658$, $\eta^2p = 0.009$; moreover, a

TABLE 1 Descriptive statistics.

		Experimental group		Comparison group	
		Pretest	Posttest	Pretest	Posttest
Perceived autonomy	*M*	3.53	3.70	3.47	3.65
	SD	0.78	0.75	0.93	0.95
Perceived competence	*M*	4.08	4.42	4.17	4.20
	SD	0.60	0.71	0.69	0.76
Perceived relatedness	*M*	4.32	4.36	4.38	4.37
	SD	0.62	0.90	0.56	0.69
Behavioral engagement	*M*	4.25	4.41	4.30	4.20
	SD	0.57	0.60	0.55	0.69
Emotional engagement	*M*	4.27	4.37	4.35	4.20
	SD	0.60	0.719	0.60	0.76
Cognitive engagement	*M*	3.86	4.21	4.04	3.92
	SD	0.800	0.79	0.80	0.93
Agentic engagement	*M*	3.86	4.15	4.01	3.91
	SD	0.69	0.80	0.819	0.98

TABLE 2 Pearson correlation coefficients – Experimental Group ($n = 90$).

		PA		PC		PR		BE		EE		CE		AE	
	Time	1	2	1	2	1	2	1	2	1	2	1	2	1	2
1. Perceived autonomy	1	–	0.179	0.444***	0.029	0.372***	0.018	0.212*	0.119	0.312**	0.042	0.432***	0.099	0.439***	0.189
	2		–	0.184	0.600***	0.212*	0.511***	0.123	0.368***	0.207*	0.292**	0.234*	0.396***	0.253**	0.389***
2. Perceived competence	1			–	0.198	0.476***	0.126	0.626***	0.272*	0.653***	0.228*	0.592***	0.289**	0.640***	0.236*
	2				–	0.210*	0.664***	0.284**	0.565***	0.262*	0.535***	0.225*	0.571***	0.250*	0.553***
3. Perceived relatedness	1					–	0.401***	0.403***	0.318**	0.469***	0.369***	0.457***	0.356**	0.513***	0.428***
	2						–	0.210*	0.466***	0.213*	0.445***	0.141	0.444***	0.255*	0.533***
4. Behavioral engagement	1							–	0.659***	0.610***	0.389***	0.523***	0.283**	0.554***	0.320**
	2								–	0.507***	0.723***	0.464***	0.547***	0.407***	0.608***
5. Emotional engagement	1									–	0.522***	0.684***	0.372***	0.507***	0.366***
	2										–	0.396***	0.678***	0.367***	0.640***
6. Cognitive engagement	1											–	0.392***	0.727***	0.383***
	2												–	0.458***	0.798***
7. Agentic engagement	1													–	0.584***
	2														–

PA, Perceived Autonomy; PC, Perceived Competence; PR, Perceived Relatedness; BE, Behavioral Engagement; EE, Emotional Engagement; CE, Cognitive Engagement; AE, Agentic Engagement. *$p < 0.05$, **$p < 0.01$, ***$p < 0.001$.

10.3389/fpsyg.2023.1220536

TABLE 3 Pearson correlation coefficients – Comparison Group ($n = 91$).

		PA		PC		PR		BE		EE		CE		AE	
	Time	1	2	1	2	1	2	1	2	1	2	1	2	1	2
1. Perceived autonomy	1	–	0.339**	0.537***	0.323**	0.340**	0.193	0.362***	0.126	0.368***	0.173	0.341***	0.192	0.486***	0.277**
	2		–	0.385***	0.742***	0.315**	0.529***	0.383***	0.491***	0.478***	0.511***	0.448***	0.665***	0.494***	0.657***
2. Perceived competence	1			–	0.551***	0.481***	0.362***	0.630***	0.382***	0.564***	0.326**	0.665***	0.530***	0.644***	0.528***
	2				–	0.438***	0.617***	0.480***	0.636***	0.541***	0.625***	0.550***	0.783***	0.532***	0.755***
3. Perceived relatedness	1					–	0.525***	0.274**	0.219*	0.292**	0.297**	0.403***	0.333**	0.387***	0.431***
	2						–	0.305**	0.486***	0.299**	0.461***	0.399***	0.520***	0.341**	0.525***
4. Behavioral engagement	1							–	0.558***	0.683***	0.387***	0.641***	0.441***	0.554***	0.387***
	2								–	0.455***	0.764***	0.448***	0.544***	0.390***	0.494***
5. Emotional engagement	1									–	0.523***	0.570***	0.489***	0.568***	0.510***
	2										–	0.423***	0.633***	0.455***	0.573***
6. Cognitive engagement	1											–	0.637***	0.729***	0.634***
	2												–	0.608***	0.831***
7. Agentic engagement	1													–	0.696***
	2														–

PA, Perceived Autonomy; PC, Perceived Competence; PR, Perceived Relatedness; BE, Behavioral Engagement; EE, Emotional Engagement; CE, Cognitive Engagement; AE, Agentic Engagement. *$p < 0.05$, **$p < 0.01$, ***$p < 0.001$.

10.3389/fpsyg.2023.1220536

TABLE 4 Summary of basic psychological needs univariate analyses of repeated measures.

	Group effect		Time effect		Time × Group effect	
	F	*p*	*F*	*p*	*F*	*p*
Perceived autonomy	0.23	0.63	5.28	<0.05	0.00	0.95
Perceived competence	0.55	0.46	10.41	<0.001	6.99	<0.01
Perceived relatedness	0.14	0.70	0.08	0.78	0.18	0.67

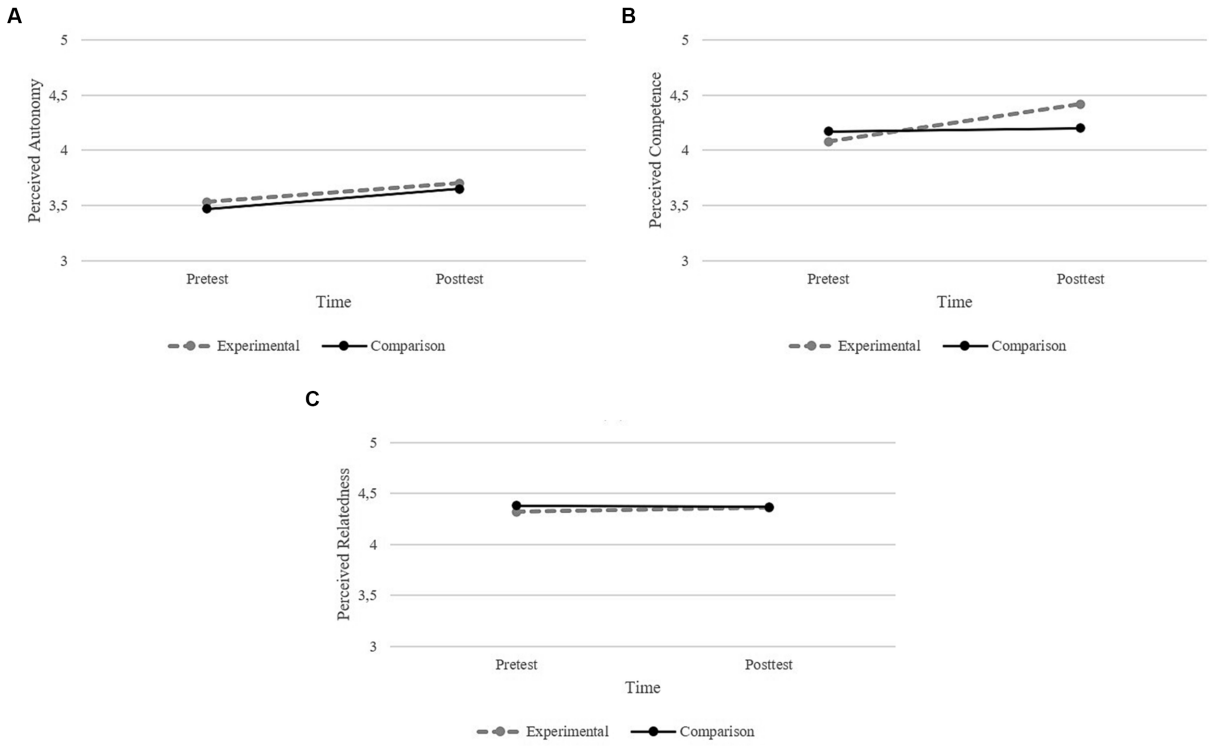


FIGURE 1
Graphical representation of Perceived Autonomy **(A)**, Perceived Competence **(B)**, and Perceived Relatedness **(C)** over time (pretest-posttest).

statistically significant multivariate time effect, Wilks' Lambda = 0.926, F (3, 175) = 4.677, p = 0.004, η^2p = 0.074, and a statistically significant multivariate group × time interaction effect were found, Wilks' Lambda = 0.942, F(3, 175) = 3.578, p = 0.015, η^2p = 0.058.

Univariate results revealed that of the three basic psychological needs, perceived autonomy and perceived competence had statistically significant results, while perceived relatedness had no statistically significant effects (see Figures 1A–C). A significant effect of time on perceived autonomy was found, F(1, 177) = 5.81, p < 0.05, η^2p = 0.029. Data also showed a significant effect of time in perceived competence, F(1, 177) = 10.405, p < 0.001, η^2p = 0.056, and of group x time interaction in perceived competence, F(1, 177) = 6.994, p < 0.01, η^2p = 0.038. Regarding these two variables, pairwise comparisons revealed that both groups increased perceived autonomy over time, however in the posttest the groups did not differ (see Figure 1A). Pairwise comparisons also revealed that from pretest to posttest, students in the experimental group reported higher perceived competence than students in the comparison group (see Figure 1B).

Concerning engagement, no statistically significant multivariate group effect was found (Table 5), Wilks' Lambda = 0.993, F(4, 174) = 0.295, p = 0.881, η^2p = 0.007; moreover, no statistically significant multivariate time effect was found, Wilks' Lambda = 0.955, F(4, 174) = 2.032, p = 0.092, η^2p = 0.045, and a statistically significant multivariate group x time interaction effect were found, Wilks' Lambda = 0.899, F(4, 174) = 4.898, p = 0.001, η^2p = 0.101.

Univariate results showed a significant effect of group x time interaction in behavioral engagement, F(1, 177) = 9.743, p < 0.01, η^2p = 0.052, emotional engagement, F(1, 177) = 6.111, p < 0.05, η^2p = 0.033, and agentic engagement, F(1, 177) = 13.589, p < 0.001, η^2p = 0.071. Data also reported a significant effect of time, F(1, 177) = 3.985, p < 0.05, η^2p = 0.022, and group × time interaction, F(1, 177) = 14.514, p < 0.001, η^2p = 0.076, in cognitive engagement. Regarding these engagement variables, pairwise comparisons showed an increase in the experimental group, from pretest to posttest, in the reported behavioral, emotional, cognitive, and agentic engagement (see Figures 2A–D). The comparison group revealed a statistically significant decrease in the reported emotional engagement from pretest to posttest (see Figure 1B).

TABLE 5 Summary of engagement univariate analyses of repeated measures.

	Group effect		Time effect		Time x Group effect	
	F	*p*	*F*	*p*	*F*	*p*
Behavioral engagement	1.10	0.30	0.62	0.43	9.74	<0.01
Emotional engagement	0.31	0.58	0.21	0.65	6.11	<0.05
Cognitive engagement	0.24	0.63	3.99	<0.05	14.51	<0.001
Agentic engagement	0.20	0.66	3.20	0.08	13.59	<0.001

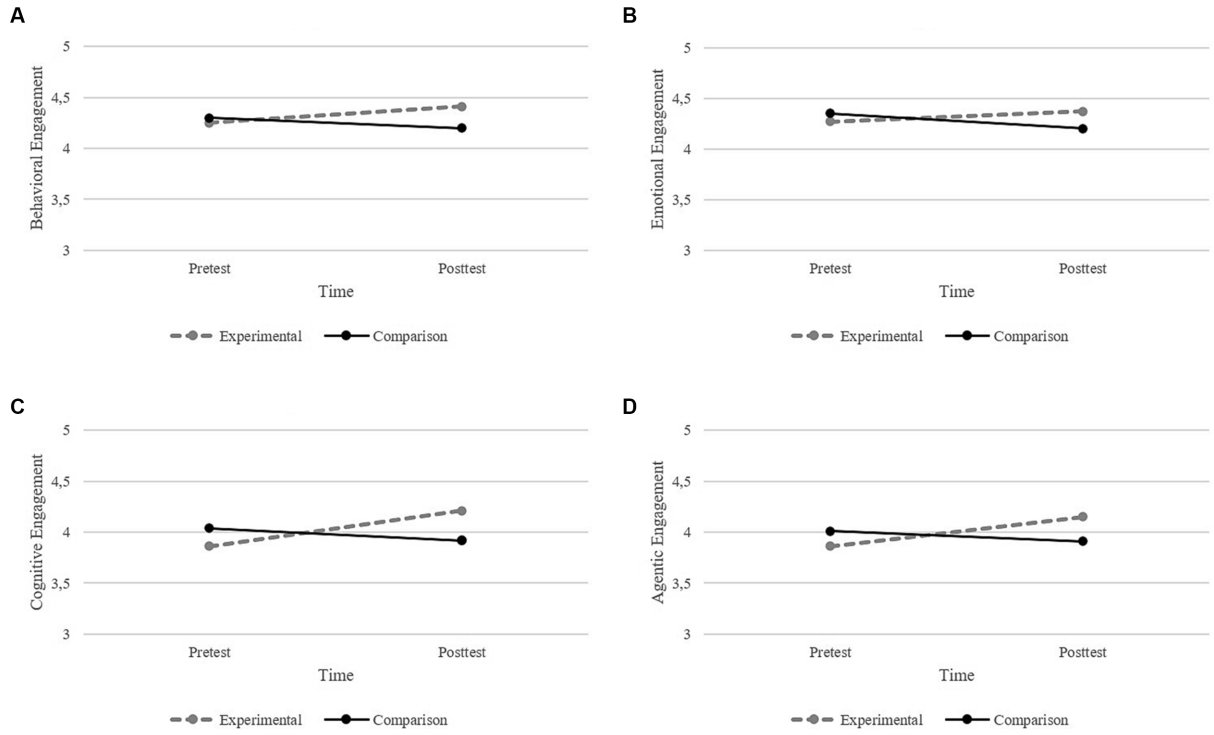


FIGURE 2
Graphical representation of the levels of Behavioral Engagement **(A)**, Emotional Engagement **(B)**, Cognitive Engagement **(C)**, and Agentic Engagement **(D)** over time (from pretest to posttest).

4 Discussion

The current study aimed to assess the impact of the narrative-based intervention "Yellow's Trials and Tribulations," implemented by fourth-grade class teachers, on their students' basic psychological needs satisfaction and classroom engagement. Grounded on prior literature (Fitzpatrick, 2012; Rosário et al., 2016; Azevedo et al., 2023), we hypothesized that students who benefited from SRL training would report higher basic psychological needs satisfaction (Hypothesis 1) and classroom engagement (Hypothesis 2) than their counterparts in the comparison group.

Regarding basic psychological needs, the study hypotheses were partially confirmed. No statistically significant differences were found between the experimental and comparison groups in two variables of the students' basic psychological needs at the end of the intervention: perceived autonomy and relatedness. At first glance, these results are surprising given the purpose and protocol of the intervention, and the qualitative findings gathered from the implementers' and observers' notes of the intervention implementation. The current intervention provides several opportunities for students to share their thoughts and opinions while learning SRL strategies. For this reason, the intervention was expected to help students experience choice in their actions, enthusiasm, and appreciation (Skinner and Belmont, 1993; Ryan and Deci, 2020). Moreover, qualitative findings indicated that implementers and observers reported several examples of students who participated by sharing their opinions during intervention sessions and in class (Cunha et al., 2023). However, students' level of perceived autonomy during the intervention and the remaining instruction time (i.e., regular classes) may be different. Possibly, teachers' motivational style during instruction time may not facilitate students' perceived autonomy (e.g., Jang et al., 2016) as much as during intervention time. As a result, students may not have perceived as much autonomy in their class when they completed the questionnaire (e.g., "In this class, I feel free"; Jang et al., 2016). Possibly for this reason, students from the experimental and comparison groups did not differ in the posttest. Regarding perceived relatedness,

although qualitative findings revealed an enhancement of students' peer relationships, data was not focused on the relationship with their class teacher - the intervention implementer (Cunha et al., 2023). This finding may explain the lack of statistical significance in the current study, given that no distinction was made between classmates and teacher relationship in the questionnaire used (e.g., "I feel a close sense of connection with people in this class"; Jang et al., 2016).

However, statistically significant differences were found for perceived competence (Hypothesis 1b). At the end of the intervention, students enrolled in the experimental group reported higher perceived competence than the students from the comparison group (although with a small effect size). This positive result is consistent with the qualitative findings that indicated that students who participated in the intervention were perceived by the implementers (i.e., teachers) and observers as being more confident and participating more in class, even for students with low prior achievement (Cunha et al., 2023). Students' acquisition of SRL strategies may have empowered them to feel more confident in their competence to participate, and the positive feedback from the implementer during the session discussions may have contributed to satisfying their need for competence (Skinner and Belmont, 1993; Ryan and Deci, 2020). Practical activities were also planned to provide diverse and optimally challenging opportunities for students to apply the SRL strategies trained in the session. This protocol may also have contributed to increasing students' perceived competence (Skinner and Belmont, 1993; Cook and Artino, 2016; Ryan and Deci, 2020).

Following the proposition that basic psychological needs are an antecedent of engagement (Deci and Ryan, 2000; Reeve, 2012; Ryan and Deci, 2020), it is possible to conclude that when basic psychological needs are satisfied, students are more likely to engage in the classroom learning activities (Deci and Ryan, 2000; Reeve, 2012; Reeve and Lee, 2014). Despite not conducting a mediation analysis (e.g., Jang et al., 2012), the improvement found in perceived competence may have contributed to students' classroom engagement. Regarding this construct, statistically significant results were found for all engagement dimensions (i.e., Hypotheses 2a-d), which is especially relevant considering that students are from a disadvantaged school neighborhood. The quantitative results retrieved from all participating students substantiate prior anecdotical qualitative findings of the implementers' and observers' overall perceived impact of the intervention on students (Cunha et al., 2023). For instance, qualitative data (Cunha et al., 2023) provided some evidence of students' participation in session and class discussions (i.e., behavioral classroom engagement), positive emotions regarding progresses and learning (i.e., emotional classroom engagement), application of self-regulation strategies during their study (i.e., cognitive engagement), and a growing willingness to share their thoughts and opinions (i.e., agentic engagement).

Notwithstanding the current positive impact of the intervention, the effect sizes found were small (i.e., behavioral and emotional engagement) and medium (i.e., cognitive and agentic engagement), depending on the engagement dimensions analyzed. These results contrast with prior research showing large effect sizes of the intervention on students' school engagement (Rosário et al., 2016; Azevedo et al., 2023). Those results could be related to distinct reasons (e.g., different outcome measures, methods of data collection, and implementers of the intervention). Regarding outcome measures and data collection methods, prior studies were focused on general school engagement instead of a restricted level of engagement. For example, in the study by Rosário et al. (2016), behavioral engagement was measured through classroom observations (several times throughout the school year) that focused on students' class attendance and punctuality, body language evidencing attention, and compliance with the class routines and rules; while in the study by Azevedo et al. (2023), behavioral engagement was measured using students' self-report of the level of distraction in schoolwork, and school records of students' class attendance and punctuality. In the case of the current study, behavioral engagement was measured through students' self-reports which focused on attention, effort, and participation in class. Moreover, according to the literature, the implementer (researcher vs. class teacher) could also be a major factor in helping explain the different effect sizes found. Contrary to prior works where researchers acted as implementors of the intervention (Rosário et al., 2016; Azevedo et al., 2023), in the current study, class teachers were the implementers. According to extant meta-analyses (see Dignath and Büttner, 2008; de Boer et al., 2018), particularly those conducted at elementary school level, interventions conducted by researchers rather than by class teachers are more effective regarding students' overall academic performance, reading or writing performance and strategy use (Dignath et al., 2008). At the same time, the intervention implemented by teachers has distinct strengths (e.g., teachers can keep encouraging students to use metacognitive skills during their work in class) as previously mentioned (Núñez et al., 2022; Tuero et al., 2022). In the school context, it is important to monitor and assess the impact of the intervention and identify aspects that need improvement. Current results provide some concrete implications for practice as described below.

4.1 Strengths, limitations, and implications

The current study, due to its interventional nature, adds to SRL and engagement literature, extending our knowledge on the impact of a SRL narrative-based intervention on students' basic psychological needs and four dimensions of classroom engagement. Moreover, this work added the agentic engagement dimension which helps highlight the contribution of the intervention in promoting students' intentional, proactive, and constructive actions in the classroom environment (Reeve and Tseng, 2011). This is consistent with the social cognitive theoretical framework of the intervention in which students are the authors of their learning path (Bandura, 1986; Rosário et al., 2010, 2017a). This sense of agency is essential to overcome challenges typically experienced by students from disadvantaged backgrounds such as those of the current participating students.

Despite the strengths of the current study, some limitations as well as implications for future research and practice should be addressed. The first limitation is related to data collection. Students reported their basic psychological needs satisfaction and classroom engagement in two moments (pre-and post-intervention), but follow-up data were not collected. Therefore, while the intervention led to positive results, future studies could consider investigating its long-term effects by planning quasi-experimental designs with follow-up measures (at least 3 months after the intervention, Tuero et al., 2022).

Moreover, no data addressing intervention-focused students' psychological needs satisfaction and engagement were collected. The

self-reported measures collected (i.e., basic psychological needs and classroom engagement) were focused on the classroom context and they do not capture the specificities of students' psychological needs and engagement in the SRL intervention. Therefore, future studies may consider using self-report measures focused on the intervention to capture students' psychological needs and engagement processes (e.g., students' participation during session discussions, peer relationships) during the intervention sessions (see Cunha et al., 2023). This would allow analyzing differences in these two variables, as students may perceive their psychological needs satisfaction and engagement differently according to the context (i.e., class vs. intervention). Collecting these data could be of particular relevance when the intervention implementers are teachers (as in the current study), because it can be used to extend their work by transferring the knowledge and intentionality applied in the intervention into the classroom context. This strategy is expected to contribute to maximizing the positive impact of the intervention (e.g., Dignath et al., 2008).

Additionally, in the current study, the implementers' competence was not assessed as recommended by Perepletchikova (2011). According to this work, the assessment of implementers' competence is an essential procedure to ensure treatment integrity by contributing to the avoidance of ambiguous interpretations regarding the evidenced-based practices implemented and intervention effectiveness. The implementers' competence to deliver interventions following the protocols (to achieve the pre-established goals) is of high importance to the intervention's effects. Grounded on this knowledge, future intervention studies may consider including direct (e.g., through observations, videotaping) or indirect assessment methods (e.g., checklists) to assess implementers' (e.g., researchers, teachers or other educators) competence in effectively implementing the intervention. These assessment methods could be used at different moments of the intervention (i.e., before, during, and after the end of the intervention) functioning as a tool for researchers and implementers. They could evaluate the adherence to the session protocol (i.e., implementation of specific procedures, tasks, and activities), monitor competences in delivering the intervention sessions (e.g., flexibility to administrate some tasks), and consequently adjust practices if needed. For instance, implementer-teachers could consider using checklists to self-monitor the competences needed to implement the intervention efficaciously. In the case of the current intervention, examples of checklist statements addressing the three basic psychological needs (Deci and Ryan, 2000; Ryan and Deci, 2020) could be: during the session (i) "I provided students the opportunity to choose their character when reading the book chapter;" (autonomy), (ii) "I provided students with positive and constructive feedback" (competence), and (iii) "I welcomed students answers and respected different opinions" (relatedness). By checking this type of statements, implementer-teachers are expected to reflect upon their approaches to students during each session and make the necessary adjustments to improve their performance on the promotion of psychological needs satisfaction. Note that implementation and integrity procedures, in particular the use of checklists to evaluate implementers' competence, should be carefully explained to the implementer-teachers before the beginning of the intervention implementation. This should be done in order to ensure that implementers perceive checklists as a work tool to improve their competence to deliver the intervention and not a mechanism for researchers to exert control over their sessions (Cunha et al., 2023). In sum, data gathered from checklists could have helped to further understand the results found, particularly, those non-statistically significant (e.g., students' perceived autonomy and relatedness).

Finally, implementers need time and opportunities to practice, consolidate, adjust their practice, and progressively increase their self-efficacy to implement effectively the intervention. For this reason, school administrators need to understand the implementation of school-based interventions as an investment in the long-term, managing resources and training opportunities to the benefit of students.

Data availability statement

The datasets presented in this article are not readily available because informed consent stated that only the research team would have access to the data. Requests to access the datasets should be directed to PR, prosario@psi.uminho.pt.

Ethics statement

The studies involving humans were approved by Ethics Committee of the University of Minho. The studies were conducted in accordance with the local legislation and institutional requirements. Written informed consent for participation in this study was provided by the participants' legal guardians/next of kin.

Author contributions

JC conceived the idea and design of the study. JC, JM, and PR were responsible for teachers' training, and practice monitoring. JC, JM, and RP were responsible for the literature search, collection, analysis, and interpretation of data for the work. JC, JM, and RP wrote the manuscript. PR was in charge of technical guidance and made an important intellectual contribution to manuscript revision. All authors contributed to the article and approved the submitted version.

Funding

This study was partially conducted at the Psychology Research Centre (CIPsi/UM), School of Psychology, University of Minho, supported by the Foundation for Science and Technology (FCT) through the Portuguese State Budget (UIDB/01662/2020). This work was co-funded by Gulbenkian Knowledge Academies (Calouste Gulbenkian Foundation).

Acknowledgments

The research team would like to thank all teachers involved in the intervention, as well as the school principal and students of the participating schools. The research team also thanks André Oliveira, Beatriz Pereira, Raquel Azevedo, Rita Nunes, and Ronei Almeida for their assistance in data collection.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Publisher's note

All claims expressed in this article are solely those of the authors and do not necessarily represent those of their affiliated organizations, or those of the publisher, the editors and the reviewers. Any product that may be evaluated in this article, or claim that may be made by its manufacturer, is not guaranteed or endorsed by the publisher.

Supplementary material

The Supplementary material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/fpsyg.2023.1220536/full#supplementary-material

References

Abu-Bader, S. H. (2010). *Advanced and multivariate statistical methods for social science research* (New York: Oxford University Press).

Appleton, J. J., Christenson, S. L., Kim, D., and Reschly, A. L. (2006). Measuring cognitive and psychological engagement: validation of the student engagement instrument. *J. Sch. Psychol.* 44, 427–445. doi: 10.1016/j.jsp.2006.04.002

Archambault, I., and Dupéré, V. (2017). Joint trajectories of behavioral, affective, and cognitive engagement in elementary school. *J. Educ. Res.* 110, 188–198. doi: 10.1080/00220671.2015.1060931

Azevedo, R., Rosário, P., Magalhães, P., Núñez, J. C., Pereira, B., and Pereira, A. (2022). A tool-kit to help students from low socioeconomic status background: a school-based self-regulated learning intervention. *Eur. J. Psychol. Educ.* 38, 495–518. doi: 10.1007/s10212-022-00607-y

Azevedo, R., Rosário, P., Núñez, J. C., Vallejo, G., Fuentes, S., and Magalhães, P. (2023). A school-based intervention on elementary students' school engagement. *Contemp. Educ. Psychol.* 73:102148. doi: 10.1016/j.cedpsych.2023.102148

Bandura, A. (1986). The explanatory and predictive scope of self-efficacy theory. *J. Soc. Clin. Psychol.* 4, 359–373. doi: 10.1521/jscp.1986.4.3.359

Ben-Eliyahu, A., Moore, D., Dorph, R., and Schunn, C. D. (2018). Investigating the multidimensionality of engagement: affective, behavioral, and cognitive engagement across science activities and contexts. *Contemp. Educ. Psychol.* 53, 87–105. doi: 10.1016/j.cedpsych.2018.01.002

Calouste Gulbenkian Foundation (2019). *Gulbenkian academies for knowledge*. Available at: https://cdn.gulbenkian.pt/academias/wp-content/uploads/sites/43/2019/07/ACG_BrochuraEN.pdf (Accessed April 20, 2023)

Cleary, T. J., and Zimmerman, B. J. (2004). Self-regulation empowerment program: a school-based program to enhance self-regulated and self-motivated cycles of student learning. *Psychol. Sch.* 41, 537–550. doi: 10.1002/pits.10177

Cleary, T. J., and Zimmerman, B. J. (2012). "A cyclical self-regulatory account of student engagement: theoretical foundations and applications" in *Handbook of research on student engagement*. eds. S. L. Christenson, A. L. Reschly and C. Wylie (Boston: Springer US), 237–257.

Cohen, J. (1988). Statistical power analysis for the behavioral sciences. (Hillsdale, NJ: Routledge).

Conesa, P. J., and Duñabeitia, J. A. (2021). The basic psychological needs in the classroom scale (BPN-CS). *Behav. Sci.* 11:96. doi: 10.3390/bs11070096

Cook, D., and Artino, A. (2016). Motivation to learn: an overview of contemporary theories. *Med. Educ.* 50, 997–1014. doi: 10.1111/medu.13074

Côté-Lussier, C., and Fitzpatrick, C. (2016). Feelings of safety at school, socioemotional functioning, and classroom engagement. *J. Adolesc. Health* 58, 543–550. doi: 10.1016/j.jadohealth.2016.01.003

Cristóvão, A. M., Candeias, A. A., and Verdasca, J. (2017). Social and emotional learning and academic achievement in Portuguese schools: a bibliometric study. *Front. Psychol.* 8:1913. doi: 10.3389/fpsyg.2017.01913

Cunha, J., Guimarães, A., Martins, J., and Rosário, P. (2023) A self-regulation intervention conducted by teachers in a disadvantaged school neighborhood: implementers' and observers' perceptions of its impact on elementary students. *Children*, 10:1795. doi: 10.3390/children10111795

Cunha, J., Silva, C., Guimarães, A., Sousa, P., Vieira, C., Lopes, D., et al. (2021). No children should be left behind during COVID-19 pandemic: description, potential reach, and participants' perspectives of a project through radio and letters to promote self-regulatory competences in elementary school. *Front. Psychol.* 12, 647–708. doi: 10.3389/fpsyg.2021.647708

de Boer, H., Donker, A. S., Kostons, D. D. N. M. D. N. M., and van der Werf, G. P. C. (2018). Long-term effects of metacognitive strategy instruction on student academic performance: a meta-analysis. *Educ. Res. Rev.* 24, 98–115. doi: 10.1016/j.edurev.2018.03.002

Deci, E. L., and Ryan, R. M. (2000). The "what" and "why" of goal pursuits: human needs and the self-determination of behavior. *Psychol. Inq.* 11, 227–268. doi: 10.1207/S15327965PLI1104_01

Dignath, C., Buettner, G., and Langfeldt, H.-P. (2008). How can primary school students learn self-regulated learning strategies most effectively?: a meta-analysis on self-regulation training programmes. *Educ. Res. Rev.* 3, 101–129. doi: 10.1016/j.edurev.2008.02.003

Dignath, C., and Büttner, G. (2008). Components of fostering self-regulated learning among students. A meta-analysis on intervention studies at primary and secondary school level. *Metacogn. Learn.* 3, 231–264. doi: 10.1007/s11409-008-9029-x

Estévez, I., Rodríguez-Llorente, C., Piñeiro, I., González-Suárez, R., and Valle, A. (2021). School engagement, academic achievement, and self-regulated learning. *Sustainability* 13:3011. doi: 10.3390/su13063011

Field, A. P. (2009). *Discovering statistics using SPSS*. London: SAGE.

Fitzpatrick, C. (2012). Ready or not: kindergarten classroom engagement as an indicator of child school readiness. *S. Afr. J. Child. Educ.* 2, 1–32. doi: 10.4102/sajce.v2i1.19

Fredricks, J. A., Blumenfeld, P. C., Friedel, J., and Paris, A. H. (2005). "School engagement" in *What do children need to flourish: Conceptualizing and measuring indicators of positive development*. eds. K. A. Moore and L. H. Lippman (Springer Science), 305–321.

Fredricks, J. A., Blumenfeld, P. C., and Paris, A. H. (2004). School engagement: potential of the concept, state of the evidence. *Rev. Educ. Res.* 74, 59–109. doi: 10.3102/00346543074001059

Fredricks, J. A., Filsecker, M., and Lawson, M. A. (2016). Student engagement, context, and adjustment: addressing definitional, measurement, and methodological issues. *Learn. Instr.* 43, 1–4. doi: 10.1016/j.learninstruc.2016.02.002

Fredricks, J. A., and McColskey, W. (2012). "The measurement of student engagement: a comparative analysis of various methods and student self-report instruments" in *Handbook of research on student engagement*. eds. S. L. Christenson, A. L. Reschly and C. Wylie (New York: Springer), 763–782.

Fredricks, J. A., Reschly, A. L., and Christenson, S. L. (2019). "Interventions for student engagement: overview and state of the field" in *Handbook of student engagement interventions: working with disengaged students*. (London: Academic Press), 1–11.

Hill, C. J., Bloom, H. S., Black, A. R., and Lipsey, M. W. (2008). Empirical benchmarks for interpreting effect sizes in research. *Child Dev. Perspect.* 2, 172–177. doi: 10.1111/j.1750-8606.2008.00061.x

Hughes, J. N., Luo, W., Kwok, O. M., and Loyd, L. K. (2008). Teacher-student support, effortful engagement, and achievement: a 3-year longitudinal study. *J Educ Psychol.* 100, 1–14. doi: 10.1037/0022-0663.100.1.1

Hulleman, C. S., and Barron, K. E. (2016). "Motivation interventions in education: bridging theory, research, and practice" in *Handbook of educational psychology*. eds. L. Corno and E. M. Anderman (New York: Routledge), 160–171.

Instituto Nacional de Estatística Censos (2021). Available at: https://tabulador.ine.pt/censos2021/ (Accessed April 21, 2023).

Jang, H., Kim, E. J., and Reeve, J. (2012). Longitudinal test of self-determination theory's motivation mediation model in a naturally occurring classroom context. *J. Educ. Psychol.* 104, 1175–1188. doi: 10.1037/a0028089

Jang, H., Kim, E. J., and Reeve, J. (2016). Why students become more engaged or more disengaged during the semester: a self-determination theory dual-process model. *Learn. Instr.* 43, 27–38. doi: 10.1016/j.learninstruc.2016.01.002

Lazowski, R. A., and Hulleman, C. S. (2015). Motivation interventions in education: a meta-analytic review. *Rev. Educ. Res.* 86, 602–640. doi: 10.3102/0034654315617832

Li, A., and Fischer, M. J. (2017). Advantaged/disadvantaged school neighborhoods, parental networks, and parental involvement at elementary school. *Sociol. Educ.* 90, 355–377. doi: 10.1177/0038040717732332

Luo, W., Hughes, J. N., Liew, J., and Kwok, O. (2009). Classifying academically at-risk first graders into engagement types: association with long-term achievement trajectories. *Elem. Sch. J.* 109, 380–405. doi: 10.1086/593939

Marks, H. M. (2000). Student engagement in instructional activity: patterns in the elementary, middle, and high school years. *Am. Educ. Res. J.* 37, 153–184. doi: 10.3102/00028312037001153

Martins, J., Cunha, J., Lopes, S., Moreira, T., and Rosário, P. (2021). School engagement in elementary school: a systematic review of 35 years of research. *Educ. Psychol. Rev.* 34, 793–849. doi: 10.1007/s10648-021-09642-5

Martins, J., Rosário, P., Cunha, J., Núñez, J. C., Vallejo, G., and Moreira, T. (2023). How to help students in their transition to middle school? Effectiveness of a school-based group mentoring program promoting students' engagement, self-regulation, and goal setting. *Contemp. Educ. Psychol.* 102230. doi: 10.1016/j.cedpsych.2023.102230

McClelland, M. M., Acock, A. C., and Morrison, F. J. (2006). The impact of kindergarten learning-related skills on academic trajectories at the end of elementary school. *Early Child Res. Q.* 21, 471–490. doi: 10.1016/j.ecresq.2006.09.003

Mullender-Wijnsma, M. J., Hartman, E., de Greeff, J. W., Bosker, R. J., Doolaard, S., and Visscher, C. (2015). Moderate-to-vigorous physically active academic lessons and academic engagement in children with and without a social disadvantage: a within subject experimental design. *BMC Public Health* 15, 1–9. doi: 10.1186/s12889-015-1745-y

Niemiec, C. P., and Ryan, R. M. (2009). Autonomy, competence, and relatedness in the classroom: applying self-determination theory to educational practice. *Theory Res. Edu.* 7, 133–144. doi: 10.1177/1477878509104318

Núñez, J. C., Tuero, E., Fernández, E., Añón, F. J., Manalo, E., and Rosário, P. (2022). Effect of an intervention in self-regulation strategies on academic achievement in elementary school: a study of the mediating effect of self-regulatory activity. *Rev. Psicodidáct. Engl. Ed* 27, 9–20. doi: 10.1016/j.psicoe.2021.09.001

Pagani, L., Fitzpatrick, C., Archambault, I., and Janosz, M. (2010). School readiness and later achievement: a French Canadian replication and extension. *Dev. Psychol.* 46, 984–994. doi: 10.1037/a0018881

Pekrun, R. (2020). Commentary: self-report is indispensable to assess students' learning. *Frontline Learn. Res.* 8, 185–193. doi: 10.14786/flr.v8i3.637

Pendergast, D., Allen, J., McGregor, G., and Ronksley-Pavia, M. (2018). Engaging marginalized, "at-risk" middle-level students: a focus on the importance of a sense of belonging at school. *Educ. Sci.* 8:138. doi: 10.3390/educsci8030138

Pereira, A., Miranda, S., Teixeira, S., Mesquita, S., Zanatta, C., and Rosário, P. (2021). Promote selective attention in 4th-grade students: lessons learned from a school-based intervention on self-regulation. *Children* 8:182. doi: 10.3390/children8030182

Perepletchikova, F. (2011). On the topic of treatment integrity. *Clin. Psychol. Publ. Div. Clin. Psychol. Am. Psychol. Assoc.* 18, 148–153. doi: 10.1111/j.1468-2850.2011.01246.x

Perry, N. E., Lisaingo, S., Yee, N., Parent, N., Wan, X., and Muis, K. (2020). Collaborating with teachers to design and implement assessments for self-regulated learning in the context of authentic classroom writing tasks. *Assessment Educ. Principles Policy Pract.* 27, 416–443. doi: 10.1080/0969594X.2020.1801576

Piñeiro, I., Estévez, I., Freire, C., de Caso, A., Souto, A., and González-Sanmamed, M. (2019). The role of prior achievement as an antecedent to student homework engagement. *Front. Psychol.* 10:140. doi: 10.3389/fpsyg.2019.00140

Pino-James, N., Shernoff, D. J., Bressler, D. M., Larson, S. C., and Sinha, S. (2019). "Chapter 8 - instructional interventions that support student engagement: an international perspective" in *Handbook of student engagement interventions*. eds. J. A. Fredricks, A. L. Reschly and S. L. Christenson (London: Academic Press), 103–119.

PORDATA (2018). *Retrato de Portugal PORDATA*. *Fundação Manuel dos Santos*. Available at: https://www.pordata.pt/Retratos/2018/Retrato+de+Portugal-74 (Accessed April, 22 2023).

Reeve, J., and Lee, W. (2014). Students' classroom engagement produces longitudinal changes in classroom motivation. *J. Educ. Psychol.* 106, 527–540. doi: 10.1037/a0034934

Reeve, J., and Sickenius, B. (1994). Development and validation of a brief measure of the three psychological needs underlying intrinsic motivation: the Afs scales. *Educ. Psychol. Meas.* 54, 506–515. doi: 10.1177/0013164494054002025

Reeve, J. (2012). "A self-determination theory perspective on student engagement" in *Handbook of research on student engagement*. eds. S. L. Christenson, A. L. Reschly and C. Wylie (New York: Springer US), 149–172.

Reeve, J., and Tseng, C.-M. (2011). Agency as a fourth aspect of students' engagement during learning activities. *Contemp. Educ. Psychol.* 36, 257–267. doi: 10.1016/j.cedpsych.2011.05.002

Reyna, V. F., and Brainerd, C. J. (2007). The importance of mathematics in health and human judgment: numeracy, risk communication, and medical decision making. *Learn. Individ. Differ.* 17, 147–159. doi: 10.1016/j.lindif.2007.03.010

Rosário, P., Högemann, J., Núñez, J. C., Vallejo, G., Cunha, J., Rodríguez, C., et al. (2019). The impact of three types of writing intervention on students' writing quality. *PLoS One* 14:e0218099. doi: 10.1371/journal.pone.0218099

Rosário, P., Núñez, J. C., and González-Pienda, J. A. (2007a). *Auto-regulação em crianças sub-10: Projecto Sarilhos do Amarelo*. Porto: Porto Editora.

Rosário, P., Núñez, J. C., and González-Pienda, J. A. (2007b). *Sarilhos do Amarelo [Yellow's trials and tribulations]*. Porto: Porto Editora.

Rosário, P., Núñez, J. C., González-Pienda, J. A., and Valle, A. (2010). "Enhancing primary school students self-regulated learning: Yellow's trials and tribulations project" in *International perspectives on applying self-regulated learning in different settings* (Almeria: Education and Psychology), 139–156.

Rosário, P., Núñez, J. C., Rodríguez, C., Cerezo, R., Fernández, E., Tuero, E., et al. (2017a). Analysis of instructional programs in different academic levels for improving self-regulated learning SRL through written text. *Brill*. 201–231. doi: 10.1163/9789004270480_010

Rosário, P., Núñez, J. C., Vallejo, G., Azevedo, R., Pereira, R., Moreira, T., et al. (2017b). Promoting gypsy children's behavioural engagement and school success: evidence from a four-wave longitudinal study. *Br. Educ. Res. J.* 43, 554–571. doi: 10.1002/berj.3271

Rosário, P., Núñez, J. C., Vallejo, G., Cunha, J., Azevedo, R., Pereira, R., et al. (2016). Promoting gypsy children school engagement: a story-tool project to enhance self-regulated learning. *Contemp. Educ. Psychol.* 47, 84–94. doi: 10.1016/j.cedpsych.2015.11.005

Ryan, R. M., and Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *Am. Psychol.* 55, 68–78. doi: 10.1037/0003-066X.55.1.68

Ryan, R. M., and Deci, E. L. (2020). Intrinsic and extrinsic motivation from a self-determination theory perspective: definitions, theory, practices, and future directions. *Contemp. Educ. Psychol.* 61:101860. doi: 10.1016/j.cedpsych.2020.101860

Sala, A., Punie, Y., Garkov, V., and Cabrera, M. (2020). LifeComp: The European Framework for Personal, Social and Learning to Learn Key Competence, *EUR 30246 EN*, (Luxembourg: Publications Office of the European Union). doi: 10.2760/922681

Santos, A. C., Simões, C., Cefai, C., Freitas, E., and Arriaga, P. (2021). Emotion regulation and student engagement: age and gender differences during adolescence. *Int. J. Educ. Res.* 109:101830. doi: 10.1016/j.ijer.2021.101830

Schuitema, J., Peetsma, T., and van der Veen, I. (2016). Longitudinal relations between perceived autonomy and social support from teachers and students' self-regulated learning and achievement. *Learn. Individ. Differ.* 49, 32–45. doi: 10.1016/j.lindif.2016.05.006

Skinner, E. A., and Belmont, M. J. (1993). Motivation in the classroom: reciprocal effects of teacher behavior and student engagement across the school year. *J. Educ. Psychol.* 85, 571–581. doi: 10.1037/0022-0663.85.4.571

Skinner, E. A., Kindermann, T. A., and Furrer, C. J. (2009). A motivational perspective on engagement and disaffection: conceptualization and assessment of children's behavioral and emotional participation in academic activities in the classroom. *Educ. Psychol. Meas.* 69, 493–525. doi: 10.1177/0013164408323233

Skinner, E. A., and Pitzer, J. R. (2012). "Developmental dynamics of student engagement, coping, and everyday resilience" in *Handbook of research on student engagement*. eds. S. L. Christenson, A. L. Reschly and C. Wylie (Boston: Springer US), 21–44.

Skinner, E. A., Pitzer, J. R., and Steele, J. S. (2016). Can student engagement serve as a motivational resource for academic coping, persistence, and learning during late elementary and early middle school? *Dev. Psychol.* 52, 2099–2117. doi: 10.1037/dev0000232

Stefansson, K. K., Gestsdottir, S., Birgisdottir, F., and Lerner, R. M. (2018). School engagement and intentional self-regulation: a reciprocal relation in adolescence. *J. Adolesc.* 64, 23–33. doi: 10.1016/j.adolescence.2018.01.005

Tuero, E., Núñez, J. C., Vallejo, G., Fernández, M. P., Añón, F. J., Moreira, T., et al. (2022). Short and long-term effects on academic performance of a school-based training in self-regulation learning: a three-level experimental study. *Front. Psychol.* 13:889201. doi: 10.3389/fpsyg.2022.889201

Van den Broeck, A., Ferris, D. L., Chang, C.-H., and Rosen, C. C. (2016). A review of self-determination theory's basic psychological needs at work. *J. Manage.* 42, 1195–1229. doi: 10.1177/0149206316632058

Wang, M.-T., and Hofkens, T. L. (2020). Beyond classroom academics: a school-wide and multi-contextual perspective on student engagement in school. *Adolesc. Res. Rev.* 5, 419–433. doi: 10.1007/s40894-019-00115-z

Wang, Z., Bergin, C., and Bergin, D. A. (2014). Measuring engagement in fourth to twelfth grade classrooms: the classroom engagement inventory. *Sch. Psychol. Q.* 29, 517–535. doi: 10.1037/spq0000050

Zimmerman, B. J. (2002). Becoming a self-regulated learner: a overview. *Theory Pract.* 41, 64–70.

frontiers | Frontiers in Education

TYPE Original Research
PUBLISHED 15 January 2024
DOI 10.3389/feduc.2023.1287259

OPEN ACCESS

EDITED BY
Pedro Rosário,
University of Minho, Portugal

REVIEWED BY
Cátia Silva,
University of Minho, Portugal
Madora Soutter,
Villanova University, United States

*CORRESPONDENCE
M. Clara Barata
✉ mclarabarata@uc.pt

RECEIVED 01 September 2023
ACCEPTED 29 December 2023
PUBLISHED 15 January 2024

CITATION
Barata MC, Alexandre J, Castro C and Colaço C (2024) Can community and educational interventions designed from the ground-up promote social and emotional learning? Experimental and quasi-experimental impacts of a country-wide Portuguese initiative.
Front. Educ. 8:1287259.
doi: 10.3389/feduc.2023.1287259

Can community and educational interventions designed from the ground-up promote social and emotional learning? Experimental and quasi-experimental impacts of a country-wide Portuguese initiative

M. Clara Barata[1]*, Joana Alexandre[2], Catarina Castro[2] and Carla Colaço[2]

[1]Institute of Interdisciplinary Research, Center of Interdisciplinary Studies (CEIS20), University of Coimbra, Coimbra, Portugal, [2]Department of Psychology, Center for Psychological Research and Social Intervention - CIS-IUL, Iscte - University Institute of Lisbon, Lisbon, Portugal

Introduction: Social and emotional learning (SEL) is a powerful predictor of several outcomes throughout life, such as relationships, citizenship behavior, academic and job performance, and mental and physical health. The Portuguese Gulbenkian Academies for Knowledge supported the implementation and rigorous impact assessment of community and educational interventions aiming to promote SEL in participants 0 and 25 years of age.

Methods: This paper presents a secondary-data analysis of the experimental and quasi-experimental impacts of 40 Academies on the OECD Survey of Social and Emotional Skills. Eight Academies (N = 4,460 participants) implemented an experimental approach, while 32 Academies (N = 14,274 participants) employed a quasi-experimental approach.

Results: We found experimental and quasi-experimental evidence of significant positive results of the Academies for various skills, and consistent impacts from the perspective of child/youth participants and teachers, particularly for Curiosity and Assertiveness. Effect sizes were small.

Discussion: The impact evaluation of the Gulbenkian Academies for Knowledge has the potential to support considerable changes in the field of SEL interventions, nationally and internationally, by informing discussion of evidence-based SEL interventions, and offering a sustainable model of capacity building with long-lasting effect on practices of SEL professionals.

KEYWORDS

social and emotional learning, experimental evaluation, quasi-experimental evaluation, educational interventions, community interventions

1 Introduction

Evidence has shown that social and emotional learning (SEL) at a young age is a powerful predictor of a variety of outcomes earlier and later in life, such as relationships with others, citizenship behavior, academic performance (Sackett and Walmsley, 2014), higher sense of school belonging (OECD, 2021a), mental and physical health (Strickhouser et al., 2017), as well as overall job and life satisfaction (Judge et al., 2002; Scorza et al., 2016).

There is also growing evidence that this set of skills is malleable, as opposed to somewhat fixed traits of personality (Weissberg et al., 2015), and can be promoted through high-quality SEL intervention programs (Jones et al., 2019), such as *Second Step* (Committee for Children; www.cfchildren.org), *Incredible Years* (Webster-Stratton, 1981, 1982), or the *PATHS* program (Kusché and Greenberg, 1994). Most available social and emotional learning interventions are universal (e.g., the aforementioned *Second Step*, *PATHS*, or *Slowly but Steadily*), i.e., their approach is aimed at promoting both protective factors and key competences, targeting a large audience of children and youth (Alexandre and Barata, 2020). These programs can be designed for all ages, from kindergarten to university students, since many of these skills start developing very early in life (e.g., Domitrovich et al., 2017; Blewitt et al., 2018).

Most SEL interventions are conducted in a school context, but there is a growing number of programs conducted outside of school time (e.g.: Kremer et al., 2015). These programs can be designed and implemented locally, or developed to be implemented country-wide, such as the *21st Century Community Learning Centers*, *Boys & Girls clubs*, or *4-H Clubs* being validated in the US (Durlak et al., 2010; Kremer et al., 2015). These community-based interventions are often designed from the ground-up, address local needs, and offer promising pathways to promoting social and emotional learning. However, they often lack rigorous monitoring and evaluation of SEL change oftentimes because such evaluation procedures require additional resources and time so that local providers may acquire and implement the technical skills needed for rigorous methods of program evaluation. Universal programs are a critical component of a multitiered system of supports, as they are likely to have the greatest reach and potential to prevent future problems. Evidence for the effectiveness of universal approaches to SEL is still lacking (Wallender et al., 2020) but is essential to inform efforts to promote the psychosocial functioning and mental wellbeing of students (Green et al., 2021).

To address these gaps in the literature, and with an aim to influence educational policymaking, the Portuguese Gulbenkian Foundation offered to co-fund 100 intervention approaches to SEL, named Gulbenkian Academies for Knowledge (henceforth referred to as Academies), which sought to promote skills of children and youth between 0 and 25 years old. These interventions took place within schools or communities across the country, over 3 cohorts and 4 years of implementation, through a variety of different methodologies and focus areas, including sports, STEM, arts, or technology.

Each of these Academies benefited from supervision from an external Monitoring and Evaluation (M&E) Team, which supported them in developing and implementing rigorous implementation monitoring and impact evaluation plans. This included regular group training sessions inspired in the Data Wise model (Boudett and Steele, 2007; Boudett et al., 2020) on important topics such as the design of a theory of change incorporating the main implementation dimensions (Weiss, 1995), rigorous impact evaluation, measurement of social and emotional skills, careful monitoring of the implementation process, and finally communication and dissemination. This amounted to a five-session training program for all teams, combined with individual tutoring based on each team's needs.

This paper presents the impact results of 40 Academies which chose to implement rigorous experimental and quasi-experimental methods, and use a standardized measure of SEL, the OECD Survey of Social and Emotional Skills, to measure the impact of their SEL intervention. The impact evaluation of the Gulbenkian Academies for Knowledge has the potential to support considerable changes in the field of SEL interventions, nationally and internationally, by informing discussion of evidence-based SEL interventions, and offering a sustainable model of capacity building with long-lasting effect on practices of SEL professionals.

2 Importance of social and emotional learning

Social and emotional skills are a multidimensional construct that encompasses a set of intrapersonal and interpersonal competencies that are important for an individual's global functioning, and to successfully interact with others (Domitrovich et al., 2017).

Despite there being some consensus on the conceptual domain and importance of these skills, there is a wide variety of theoretical frameworks attempting to define, organize and operationalize SEL (Kotsiou et al., 2022). The most widely cited approach is by the Collaborative for Academic, Social, and Emotional Learning (CASEL), which defines SEL as the "process through which young people and adults acquire and effectively apply the knowledge, skills, and attitudes to develop healthy identities, manage emotions and achieve personal and collective goals, feel and show empathy for others, establish and maintain supportive relationships, and make responsible and caring decisions" (CASEL, 2020, p. 5). This conceptual approach frames SEL as five broad, interrelated areas of competence: self-awareness, self-management, social awareness, relationship skills, and responsible decision-making (CASEL, 2020).

Using a combination of the CASEL, the Big Five model (Goldberg, 1990), and other conceptual frameworks, the OECD proposed a policy approach to this domain highlighting the malleable, learnable and context-dependent character of the skills (Kankaraš and Suarez-Alvarez, 2019). The OECD approach organized SEL in five dimensions: Collaboration, Task Performance, Emotional Regulation, Engagement with Others, and Open-mindedness. Each dimension then encompasses several individual skills, which are the focus of the SSES, as can be seen in Table 1.

Based on this approach, the OECD implemented the first large-scale international study on social and emotional skills for children and youth – the Study on Social and Emotional Skills (SSES; OECD, 2021a). This study aimed to describe how SEL develops in children and youth, and to map aspects of their daily settings – family, school, community – that could potentially promote or hinder the development of SEL. The study collected data in 10 cities around the world, with over 60,000 participants of 10 and 15 years of age, their parents, and teachers. The survey collected data on 15 different social and emotional skills, as well as on sociodemographic, family, school,

TABLE 1 Domains, definitions, and skills from OECD conceptual framework for social and emotional skills (OECD, 2021a).

Domain	Skill
Collaboration The ability to have sympathy towards others and express altruism, leading to better quality relationships and more pro-social behaviors.	Empathy
	Trust
	Cooperation
Task performance Being self-disciplined and persistent, with a tendency to stay on task and to be a high achiever.	Responsibility
	Self-control
	Persistence/Perseverance
Emotional regulation What allows an individual to effectively manage negative emotional experiences and stressors.	Resilience/Stress resistance
	Optimism
	Emotional control
Engagement with others Being extraverted, energetic, positive, and assertive, having an ease to establish social connections.	Sociability
	Assertiveness
	Energy
Open-mindedness The will to accommodate different perspectives and new experiences.	Curiosity
	Tolerance
	Creativity

and community contextual characteristics. Portugal was represented in this study by the Municipality of Sintra, contributing with over 3,000 participants, and thus constituting the sample for the initial Portuguese adaptation of the survey instrument.

The OECD study, and the resulting survey, stand as a valuable effort to develop a comprehensive measure to the assessment of a broad array of social and emotional skills, allowing for researchers and practitioners to further delve into the evidence-based promotion and evaluation of SEL (Castro et al., 2023). The data from the study further confirmed the positive association between social and emotional skills and school achievement in reading, mathematics, and arts; the maximum educational level students expect to attain; life satisfaction and psychological wellbeing; and social relations at school, both with teachers and peers (OECD, 2021a).

3 Diversity of SEL interventions

The emphasis given to social and emotional learning in the school context, and associations with other skills and well-being, as well as the notion that these competences are malleable and can be learned, has given rise to a significant number of programs to promote social and emotional competences.

Two of the most widely implemented, studied and replicated programs in the school context are the US-based Promoting Alternative Thinking Strategies (PATHS) and the Second Step programs. The PATHS program (Kusché and Greenberg, 1994) aims to promote self-control, emotion regulation, attention, communication, and problem solving in students from kindergarten to 6th grade, to ultimately reduce behavioral problems and improve teaching and learning in the classroom. This program is designed to be implemented by teachers or school counselors over the school year (Domitrovich et al., 2019). Another famous program is the Second Step program (Committee for Children; www.cfchildren.org), which directly targets students' empathy, emotional management, and problem solving skills, in order to "strengthen their ability to learn" (Low et al., 2016) with 24 in-class weekly 30 min sessions implemented by teachers from kindergarten to second grade.

The majority of SEL interventions are implemented in school settings – ideally using a whole-school approach, given the privileged characteristics of these contexts in accessing all children, and tapping into the many levers of a systemic intervention (Corcoran et al., 2018; Durlak et al., 2022). There is strong evidence for a whole-school approach in promoting social and emotional skills, in comparison to focusing on a single school level, agent, or group of students (Goldberg et al., 2019). Examples of whole-school approaches to SEL include the *Positive Action* program (in the US; Flay and Allred, 2010), focused on promoting positive self-concept and self-esteem in K-12 students, with in-class, extra-class and family components; or the RESCUR program (in Europe; Cefai et al., 2015), a resilience curriculum for early years and primary schools aimed at develop children's relationships skills, growth mindset, and self-determination, by connecting families and school professionals in benefiting from the intervention (Cefai et al., 2018).

However, SEL interventions can go beyond the school context, and often target skills broader than those relevant for school success. For example, the Incredible Years program was developed by Webster-Stratton (1981, 1982) to impact skills much earlier in life. Incredible Years was first designed as a parental intervention for reducing behavioral problems and promoting SEL in children aged between 3 and 8 years old, and has since been adapted to teacher-and child-focused interventions, and widely implemented worldwide. Its aim is to reduce risk factors in parent and teacher practices, as well as early onset conduct problems and emotional difficulties in young children, via the promotion of the child's social and emotional development (Fossum et al., 2017).

SEL programs can also be implemented after-school, and/or outside school grounds in a variety of community settings (Durlak et al., 2010; Kremer et al., 2015; Schwartz et al., 2020). The diversity of contexts as also broadened the scope and thematic areas of SEL programs, now including such diverse approaches to skill development as STEM, arts, sports, among others. The 21st Century Community Learning Centers (CCLCs), in place in the US since 1994, is a program aiming to "open up schools for broader use by their communities" (James-Burdumy et al., 2005, p.1). After school hours and during school break periods; CCLCs offer regular opportunities for students and families to improve academic performance, benefit from a safe environment and from cultural enrichment opportunities, enjoy recreational activities, develop socially, and benefit from various family services. Similarly, the 4-H Clubs (Kremer et al., 2015) aim to promote positive youth development by leading children and youth to design and implement community development projects in different areas (health, science, agriculture, civic engagement) with the guidance from adult mentors, encouraging participants to take on proactive leadership roles, through in-school and after-school programs, and school and community clubs.

In Portugal, some of the most widely replicated and validated interventions include the *Slowly but Steadily* program (Raimundo, 2007), which consists of 21 teacher-led, in-class 1 h sessions, with students between 1st and 6th grades (i.e., 6–12 years old); or the *Positive Attitude* program (Coelho and Figueira, 2011), consisting of

13 one-hour weekly sessions, implemented by the school psychologist in the classroom, with students from 7st to 9th grade (i.e., 13–15 years old). Both programs are based on the CASEL approach to social and emotional learning, and both target its domains of self-awareness, social awareness, self-control, interpersonal relationships, and responsible decision making, operationalizing them through different activities and program dosages to each skill (Raimundo et al., 2013; Cristóvão et al., 2017; Coelho et al., 2023).

4 Monitoring and evaluating SEL programs

Keeping up with the increase in the number of SEL interventions developed over the past decades, there has been a systematic concern for evaluating the impact of SEL programs. Some of these programs have provided evidence of impacts in a set of important domains in the lives of children and young people (Durlak et al., 2010, 2011; Boncu et al., 2017). Research has shown that promoting social and emotional skills positively affects academic achievement in reading, mathematics, and science (Corcoran et al., 2018), as well as in children's school engagement (Santos, 2022). Additionally, SEL interventions consistently show results in decreasing bullying and externalizing behaviors, as well as in increasing overall mental health and well-being (e.g., Durlak et al., 2010; Domitrovich et al., 2017; van de Sande et al., 2019). These positive impacts are seen not only in the short term, but also medium and long term, for instance by being related to better jobs and higher income in adulthood (Chernyshenko et al., 2018).

For instance, the *PATHS* program reports an increase in participants' emotional understanding, self-control, social problem solving, peer relations, and a decrease in externalizing symptoms (Domitrovich et al., 2019). The *Incredible Years* program has been showing an improvement in children's social skills and social competence, and a decrease in disruptive behaviors, aggression, and internalizing problems (Fossum et al., 2017). As for Portuguese interventions, *Slowly but Steadily* has shown effects in participants' peer relations and social competence; whereas *Positive Attitude* recently showed impacts on social awareness, self-control, relationship skills, and responsible decision making in a national sample of young participants (Coelho et al., 2023).

Despite the evidence of positive benefits, Tanner-Smith et al. (2018), in a review of meta-analyses, highlight that the effect sizes found in programs promoting social and emotional skills are lower than those found in other scientific areas (as stipulated by Cohen, 1988). More recent meta-analyses (e.g.: Cipriano et al., 2023) confirm the results already found elsewhere (e.g.: Durlak et al., 2011; Tanner-Smith et al., 2018) regarding these reduced effect sizes, as well as the fact that these interventions promoting social and emotional competences still demonstrate greater effects on beliefs and attitudes, social and emotional competences, and reduction of emotional stress, than on the reduction of externalizing behavior or on academic performance.

Considering that most meta-analyses and systematic reviews on SEL program implementation and evaluation include mostly studies from Anglo-Saxon countries (e.g., Corcoran et al., 2018), a recent systematic review by Fernández-Martín et al. (2021) analyses the efficacy of Ibero-American SEL interventions on increasing school performance and social and emotional skills in children of different school grades. In this study, which found similar results to those found in research in Ango-Saxon countries, 12 Portuguese studies evaluating the impact of SEL interventions were included (Fernández-Martín et al., 2021).

Despite Portugal being identified as one of the countries in the Ibero-American scene that has been most committed to implementing and evaluating SEL interventions in educational settings over the last decade (Fernández-Martín et al., 2021), the evidence of social and emotional learning or social and emotional skills focused programs is still scarce and scattered in Portugal. Cristóvão et al. (2017) found a total of 19 publications regarding SEL program evaluations in Portugal, over an eight-year period (between 2008 and 2016). Although an increase in the number of publications is to be expected up to the present date, there is still a very small proportion of SEL programs being evaluated in Portugal in relation to those which are implemented in schools and community services across the country (Cristóvão et al., 2017). Thus, the current state of research on SEL program implementation and evaluation corroborates the importance and efficacy of these programs and adds to the need to monitor and evaluate social and emotional skills-focused programs in the Portuguese setting.

5 Gulbenkian academies for knowledge

In 2018, the Portuguese Calouste Gulbenkian Foundation set out to implement a national mechanism for the development and support of innovative solutions for complex societal problems. In order to do so, the Foundation offered to co-fund intervention approaches to SEL, named Gulbenkian Academies for Knowledge (henceforth referred to as Academies). Academies could include a broad array of domains of intervention such as educational, science learning, health, civic participation, among others, but had to contribute to the common goal of developing social and emotional competencies of children and youth 0–25 years of age across the country.

Between 2018 and 2022, the Foundation opened three rounds of applications (2018, 2019, 2020) in order to select 100 community-or school-based projects. Each project could be implemented across 1, 2 or 3 years. Because some Academies chose to test their intervention only in their second year of funding, there were in total 4 cohorts of Academies, across four school years.

In terms of implementation strategy, Academies could choose to implement intervention previously validated approaches with proven results (such as the *Incredible Years* Program, Webster-Stratton, 1981, 1982), or choose to develop and implement pilot programs or innovative interventions, designed by each Academy from the ground-up. Following the OECD approach to SEL, the initiative chose to focus on the following main competencies: Adaptability, Self-regulation, Communication, Creative thinking, Critical Thinking, Resilience, and Problem Solving.

In addition to co-funding the intervention, the Foundation offered the selected programs the technical support of an external Monitoring and Evaluation Team, which assisted Academies in all stages of their evaluation processes. The M&E Team provided continuous training opportunities to all Academies using a training model, based on the Data Wise model (Boudett and Steele, 2007;

Boudett et al., 2020), focused on aspects related to monitoring (how to design a Theory of Change, how to observe program implementation, how to use program implementation monitoring data to improve interventions), impact evaluation (how to conceptually align intervention and evaluation, how to select evaluation measures, how to constitute intervention and control groups, how to analyze and discuss results), and ethical aspects inherent to research in the field. The M&E team also granted regular ethics and data protection awareness training sessions to all Academies, and provide countless session of mentoring and individual consultancy. Examples of mentoring and consultancy included detailed revision of evaluation materials, field visits to the evaluation teams to provide *in-situ* training, regular calls to fine-tune the theory of change, but also leveraging connections and networking between Academies geographically distant.

In exchange for this support, the Foundation requested that all Academies attempt to use an experimental approach to the impact evaluation of their intervention, by randomly assigning participants to control and intervention groups and collecting pre-test and post-test to the highest standards of program evaluation. Mostly because of ethical concerns with randomized controlled trials, and also limitations imposed by Covid-19, many Academies were unable to implement true experiments, and proceeded to implement quasi-experimental trials, by matching chosen intervention groups with comparison groups that were "equal in expectation," i.e., assumed to be equal in observables and non-observables (Murnane and Willett, 2011). Another large group of academies were unable to employ rigorous methods of impact evaluation and conducted observation studies, monitoring the growth of SEL from the beginning to the end of their intervention.

The Foundation also required the use of the SSES (OECD, 2021a; Castro et al., 2023) as a common metric of impact measurement across Academies. This meant Academies were requested to use SSES for pre-and post-test assessment of all participants in their evaluation. Because theories of change across Academies varied greatly, and the Foundation wanted to fund intervention approaches with a clear goal, Academies could choose a minimum of two SSES competencies to monitor across evaluation stages. Since each Academy would select the SSES subscales that best aligned with their Theory of Change, i.e., that evaluated the social and emotional skills targeted by their intervention, there is great variability in choice and number of skills to be evaluated. Moreover, no items from the Energy subscale could be used because this skill was not aligned with the theoretical scope of the Foundation work. Academies were also incentivized to complement their impact evaluation with other standardized measures of assessment closer to their theory of change.

All Academies were also recommended to involve at least 100 participants in their impact evaluation, in order to ensure some statistical power in their impact evaluation. Although this was not mandatory, it was strongly recommended, and most of the projects complied to this rule.

6 The present study

To address previous gaps in the literature, and with an aim to influence educational policymaking, The Portuguese Gulbenkian Academies for Knowledge supported the implementation and rigorous impact assessment of community and educational interventions aiming to promote SEL in participants 0 and 25 years of age. Of these, eight Academies implemented an experimental approach, while 32 Academies employed a quasi-experimental approach to their impact evaluation.

This paper presents the secondary-data analysis of the experimental and quasi-experimental impacts of 40 Academies on the OECD Survey of Social and Emotional Skills in order to address the following research question: Can community and educational interventions using diverse intervention approaches change social and emotional learning? Specifically, what were the experimental and quasi-experimental impacts of Academies in SEL?

7 Method

7.1 Participants and settings

The study sample included participants from 40 Academies on a standardized measure of SEL, the OECD Survey of Social and Emotional Skills (SSES). Eight Academies chose to implement an experimental approach (20%), by randomly assigning participants to control and intervention groups. Thirty-two academies employed a quasi-experimental approach (80%), by matching chosen intervention groups with comparison groups. The requirement to use the SSES as a common impact measure was implemented starting in the second cohort of Academies, because SSES was not available prior. Therefore, no data from Academies implementing in the first cohort were included (2018–2019). Moreover, due to the low quality and quantity of data from the 2nd edition (2019–2020), which was severely impacted by the outburst of the COVID-19 pandemic midyear, data from these 40 Academies which implemented the SSES Child/Youth Form generally came from the third and fourth cohorts (2020–2021 and 2021–2022, respectively). Academies which chose not to administer the SSES in any of its forms have been excluded from the present study. Finally, all Academies were requested to provide written consent to the use of their data for the purpose of this study; eight Academies never replied to this request and were therefore excluded from the study sample.

Supplementary Table S1 provides an overview of program characteristics for the 40 Academies in the study sample. Academies targeted very diverse domains of intervention in addition to education, such as arts, science, culture, technology, sports, health, and solidarity. While the majority developed in a school context, many included community involvement, and a few used also family outreach. These Academies were also of considerable geographical diversity, and while most targeted 6 to 12 years old, there was also quite a lot of variation in age groups.

Supplementary Table S2 presents implementation and evaluation data for the 40 Academies in the study sample. These data indicated that participants received on average between 6.4 and 46.3% of intervention sessions. Satisfaction as reported by direct participants (children and youth) was quite high. The last column lists the SEL skills chosen as targets by Academies. Some Academies chose a wide range of SEL Skills which may indicate a lack of focus and a potential for low impact given that some programs were of very short duration.

The experimental sample was comprised of 4,460 participants, 52% of which were female, and with ages ranging from 0 to 25 years

TABLE 2 Descriptive statistics for academies using an experimental approach to impact analysis.

Variable	N	Mean	SD	Min	Max	Skewness	Kurtosis
Child's age	4,316	10.279	5.681	0	25	−0.044	2.046
Child is in pre-school	3,413	0.294	0.455	0	1	0.907	1.822
Child's school grade	3,413	4.999	4.231	0	16	0.223	1.861
Child is female	4,271	0.515	0.500	0	1	−0.061	1.004
Child has special educational need	1,556	0.036	0.186	0	1	4.982	25.823
Child is Portuguese	1746	0.932	0.251	0	1	−3.445	12.869
Child attends public school	2,865	0.714	0.452	0	1	−0.950	1.902
Child has failed a year (at school)	1,275	0.185	0.389	0	1	1.622	3.630
Mom is Portuguese	1917	0.918	0.275	0	1	−3.037	10.223
Mom's age	2,344	41.970	7.065	21	67	0.075	2.880
Mom's schooling	2,557	4.010	1.094	1	5	−0.946	3.109
Mom works	2,678	0.847	0.361	0	1	−1.923	4.697
Mom is married	1,390	0.722	0.448	0	1	−0.993	1.985
Dad is Portuguese	1805	0.921	0.269	0	1	−3.130	10.797
Dad's age	2,186	44.595	7.508	23	86	0.277	3.428
Dad's schooling	2,393	3.768	1.222	1	6	−0.660	2.489
Dad works	2,503	0.923	0.267	0	1	−3.171	11.052
Dad is married	1,201	0.762	0.426	0	1	−1.230	2.512
Family receives social aid	1,006	0.878	1.536	0	5	1.598	4.311
Child has siblings	1,649	0.803	0.398	0	1	−1.523	3.319
Child's nr of siblings	1,324	1.500	1.143	1	27	10.443	201.978
Child lives with parents	1,650	0.965	0.183	0	1	−5.097	26.983
Child lives in an urban area	1,266	0.626	0.484	0	1	−0.522	1.273

old ($M = 10.28$, SD = 5.68). Mean school grade was the 5th grade ($M = 4.99$, SD = 4.23), and the majority of participants (93%) were Portuguese. Both parents of the participants were predominantly Portuguese (92% of mothers and of fathers), and their highest educational level was, on average, high school, although mothers scored higher (mother's educational level $M = 4.01$, SD = 1.09, father's educational level $M = 3.77$, SD = 1.22[1]). Most families lived in an urban setting (63%) (Table 1).

In the experimental study sample, participants in the intervention group were statistically different from participants in the control group in 5 out of 23 descriptive characteristics, largely testifying to the success of the randomization process. In specific, participants in the intervention group were older, more likely to attend public school, more likely to have a Portuguese mother and father, and less likely to have siblings, than participants in the control group (Table 2).

The quasi-experimental sample was comprised of 14,274 participants, 50% of which were female, and with ages ranging from 3 to 25 years old ($M = 10.92$, SD = 3.98). Mean school grade was the 5th grade ($M = 5.22$, SD = 3.57), and the majority of participants (93%) were Portuguese. Both parents of the participants were predominantly Portuguese (88% of mothers and of fathers), and their highest educational level was, on average, high school, although mothers scored higher (mother's educational level M = 3.80, SD = 1.15, father's educational level $M = 3.52$, SD = 1.19[2]). Most families lived in an urban setting (68%) (Table 3).

In the quasi-experimental study sample, participants in the comparison group were statistically different from participants in the intervention group in 13 out of 23 descriptive characteristics, testifying to the partial success of the matching process. In specific, participants in the intervention group were younger, attended lower educational levels, were more likely to have a special education diagnosis, less likely to attend public school, and more likely to have repeated a year, than participants in the comparison group. Moreover, in terms of their family characteristics, participants in the intervention group had younger mothers, of lower educational levels, who were less likely to work; and fathers also of lower educational levels, who were less likely to work. Finally, intervention participants lived in households that were more likely to received some form of support by social services,

1 Scores were obtained by categories related to the Portuguese schooling system: 0=Cannot read or write; 1=up to the 4th grade, 2=up to the 6th grade, 3=up to the 9th grade, 4=up to the 12th grade, 5=university degree.

2 Scores were obtained by categories related to the Portuguese schooling system: 0=Cannot read or write; 1=up to the 4th grade, 2=up to the 6th grade, 3=up to the 9th grade, 4=up to the 12th grade, 5=university degree.

TABLE 3 Descriptive statistics for academies using a quasi-experimental approach to impact analysis.

Variable	*N*	Mean	SD	Min	Max	Skewness	Kurtosis
Child's age	11,037	10.923	3.982	3	25	0.451	2.297
Child is in pre-school	11,924	0.073	0.260	0	1	3.284	11.784
Child's school grade	11,924	5.221	3.567	0	16	0.478	2.170
Child is female	12,106	0.504	0.500	0	1	−0.016	1.000
Child has special educational need	8,458	0.060	0.238	0	1	3.699	14.681
Child is Portuguese	9,837	0.925	0.263	0	1	−3.240	11.501
Child attends public school	11,434	0.935	0.246	0	1	−3.533	13.479
Child has failed a year (at school)	9,189	0.130	0.337	0	1	2.197	5.826
Mom is Portuguese	8,867	0.875	0.330	0	1	−2.275	6.174
Mom's age	8,011	40.946	6.556	20	88	0.086	3.179
Mom's schooling	9,275	3.800	1.147	1	5	−0.756	2.765
Mom works	8,422	0.809	0.393	0	1	−1.571	3.467
Mom is married	7,142	0.743	0.437	0	1	−1.109	2.230
Dad is Portuguese	8,279	0.883	0.321	0	1	−2.383	6.676
Dad's age	7,173	43.380	7.203	23	76	0.316	3.408
Dad's schooling	8,488	3.521	1.191	1	6	−0.463	2.346
Dad works	7,802	0.903	0.295	0	1	−2.730	8.454
Dad is married	6,713	0.768	0.422	0	1	−1.270	2.613
Family receives social aid	7,288	0.612	1.267	0	5	2.152	6.920
Child has siblings	7,985	0.785	0.411	0	1	−1.388	2.927
Child's nr of siblings	6,269	1.595	1.065	1	19	4.055	41.449
Child lives with parents	8,161	0.942	0.235	0	1	−3.764	15.171
Child lives in an urban area	7,290	0.681	0.466	0	1	−0.777	1.604

with a larger number of siblings, and more likely to live with their parents.

7.2 Measures

7.2.1 SSES – child/youth form

The SSES – Child/Youth form (OECD, 2021a) is a self-report instrument composed of 120 items, answered in a scale of one (Totally disagree) to five (Totally agree), which allows the assessment of a set of 15 social and emotional skills by child or youth participants aged between eight and 17 years old. It includes the following 15 subscales, with eight items each: Optimism (OPT; e.g.: "I look at the bright side of life"), Responsibility (RES; e.g.: "I am a responsible person"), Curiosity (CUR; e.g.: "I like learning new things"), Self-control (SEL; e.g.: "I stop to think before acting"), Emotional control (EMO; e.g.: "I stay calm even in tense situations"), Cooperation (COO; e.g.: "I get along well with others"), Sociability (SOC; e.g.: "I make friends easily"), Assertiveness (ASS; e.g.: "I enjoy leading others"), Creativity (CRE; e.g.: "I have a good imagination"), Resilience/Stress resistance (STR; e.g.: "I am relaxed and handle stress well"), Persistence/Perseverance (PER; e.g.: "I make sure that I finish tasks"), Empathy (EMP; e.g.: "I know how to comfort others"), Tolerance (TOL; e.g.: "I like hearing about other cultures and religions"), Trust (TRU; e.g.: "I believe most people are kind") and Energy (ENE; e.g.: "I am full of energy"). The survey could be administered in paper format or online format. Data from the global sample of SSES's main study by OECD (2021) indicates Cronbach's alpha's internal consistency levels between 0.71 (Empathy) and 0.85 (Assertiveness). An ongoing validation study of the Portuguese adaptation of the Child/Youth form of the Survey on Social and Emotional Skills (SSES) shows that the measure has good internal consistency and sensitivity, while also being sensitive to change over time (Castro et al., 2023).

7.2.2 SSES – teacher form

The SSES – Teacher form (OECD, 2021a) is a teacher-report instrument composed of 45 items, answered in a scale of one (Totally disagree) to five (Totally agree), which allows the assessment of a set of 15 social and emotional skills of child or youth participants aged between eight and 17 years old. It includes the same 15 subscales as the Child/Youth form, with three items each: Optimism (OPT; e.g.: "This student is a happy person"), Responsibility (RES; e.g.: "This student always keeps his/her promises"), Curiosity (CUR; e.g.: "This student likes learning new things"), Self-control (SEL; e.g.: "This student can control his/her actions"), Emotional control (EMO; e.g.: "This student keeps his/her emotions under control"), Cooperation (COO; e.g.: "This student likes to help others"), Sociability (SOC; e.g.: "This student makes friends easily"), Assertiveness (ASS; e.g.: "This student is a leader"), Creativity (CRE; e.g.: "This student has a good imagination"), Resilience/Stress resistance (STR; e.g.: "This student worries about

many things"), Persistence/Perseverance (PER; e.g.: "This student keeps working on a task until it is finished"), Empathy (EMP; e.g.: "This student can sense how others feel"), Tolerance (TOL; e.g.: "This student likes hearing about other cultures and religions"), Trust (TRU; e.g.: "This student believes that their friends will never betray them"), and Energy (ENE; e.g.: "This student is full of energy"). The survey could be administered in paper format or online format. Data from the global sample of SSES's main study by OECD (2021) indicates Cronbach's alpha's internal consistency levels between 0.68 (Resilience/Stress resistance) and 0.93 (Persistence). Due to weaker psychometric properties in OECD's field test results (OECD, 2021b), the subscale *Trust* was excluded from the teacher form in its administration within the Gulbenkian Academies, hence being absent from our data.

7.2.3 Sociodemographic questionnaire

To facilitate collection of sociodemographic information, the M&E team proposed a draft questionnaire mapping a set of characteristics of participants (i.e., child's age, school grade, gender, nationality, whether the child has special educational needs, is in pre-school, attends public school, has failed a school year), their families (mom and dad's nationality, age, completed schooling, and whether each one works, and is married) and household (how many sources of social aid, whether the child has siblings and how many, whether child lives with parents, and in an urban area). This questionnaire was adapted by each Academy to their evaluation needs and sample characteristics. Depending mostly on the age of the target group, this questionnaire could be answered by the participants, their parents or legal representatives, teachers or other parties.

7.3 Databases

This paper employed only secondary-data analysis directly collected by each Academy's team with their participants. Based on training and supervision from the External Monitoring and Evaluation team, Academies used common data collection and management procedures, as well as ethical procedures, while also selecting the appropriate mechanisms to match the specific needs of its setting and sample. For example, all Academies were required, prior to assessment, to collect informed consent from each participant's legal tutor, but had to prepare materials (paper versions or online versions of each measure; adjustment to age), and adequate locations (e.g., classrooms, community facilities) for data collection depending on the characteristics of their target group.

Data collection procedures could be managed and implemented by any adequately trained member of the Academy's team, including teachers, social and youth workers, psychologists, researchers, among others, with supervision. Depending mostly on the age of the participants, data collection materials could be answered by the participants, or with the help of an adult.

In line with the ethical considerations guiding research and intervention practice, when collecting the data, Academies were instructed to bear in mind its delicate nature and the need to keep the privacy of children/youths and their families protected. The M&E team recommended that data should only be accessed by a reduced number of team members. Moreover, all Academies were instructed to collect oral assent prior to assessment, and debrief underaged participants of study goals and procedures. The M&E team granted regular ethics and data protection awareness training sessions to all Academies, and provide countless sessions of mentoring.

Data on the participants' sociodemographic characteristics, their group assignment, and pre and post-teste SSES scores was then fully anonymized, with each participant being assigned an ID by their Academy's team, and submitted by the Academies to the M&E Team for further cleaning and analysis. All data cleaning and analysis procedures ensured confidentiality. Additionally, regarding pre-test and post-test scores, there is a decrease in sample size across subscales due to missing data: respondents may only have participated in one of the data collection moments, with participant mortality being common at post-test.

Finally, all Academies whose data is included in this paper granted their approval for it to be processed and published for this purpose by the M&E Team via signed informed consent.

7.4 Data analysis

To evaluate the impact of the Academies on the targeted social and emotional skills, we used a multilevel regression model for each specific competency at the end of implementation (i.e., at post-test), comparing intervention group with control or comparison group, and controlling for: (a) the same competency at the start of each implementation (i.e., at pre-test), (b) participants' sociodemographic characteristics, and (c) clustering by Academy.

For Academies with an experimental design (i.e., with a randomized control group), the inclusion of control variables in the model allows to increase the accuracy of the estimate (i.e., decrease the confidence interval), assuring a significant effect is indeed detected. For Academies with a quasi-experimental design (i.e., with a non-randomized comparison group), the inclusion of control variables in the multilevel models aimed to decrease some initial differences between groups that have not been controlled by experimental design, and thus isolate the real impact estimate (Murnane and Willett, 2011).

The use of a multilevel model allowed us to respect the nature of the data, distributing the variation in the post-test measurement of each skill between variation between Academies, and individual variation. A preliminary assessment using the Intraclass Correlation Coefficient (ICC) determined that, in all skills evaluated by more than one Academy, part of the variation was indeed attributed to differences between Academies. Intraclass Correlations varied between 1.70 and 57.60% for the SSES – Child/Youth form, and 0% (only one case) and 24.50% for the SSES - Teacher form. In cases where sample limitations (whether in sample size or due to imbalance) did not allow for a multilevel analysis, a multiple regression model was used.

In order to decrease the impact of missing data on the sample available for analysis, a multiple imputation (of 20 bases) was used for sociodemographic and pretest data. No multiple imputation of outcome data was performed.

As recommended by APA (Espírito-Santo and Daniel, 2015), results for each subscale are summed in terms of significance level (i.e., $p < 0.05$) and effect size (ES), i.e., the difference between the adjusted mean of participants from the intervention group and that of participants from the control or comparison group, expressed in a proportion of the standard deviation of that same subscale for the control or comparison group (Gormley et al., 2005; Wong et al., 2008). The effect size indicates, thus, the amplitude of the effect, regardless of

the measure or method used; it does not depend on sample size, as the *p* value does, and it contributes to understanding the impact results, since it allows to examine the magnitude of differences (Tanner-Smith et al., 2018). Significant positive effect sizes are interpreted as evidence of impacts in favor of the intervention group; significant negative effect sizes are interpreted as evidence of impacts in favor of the control or comparison groups.

According to Cohen (1988), an ES is considered small if <0.2, with this value being common in interventions with children (Kraft, 2020); moderate if between 0.2 and 0.6, and large when >0.6. Sawilowsky (2009) then expands these, adding very small (<0.01), very large (>1.20) and huge (>2.00). There is, however, some debate regarding effect sizes in social sciences, and in educational sciences in particular, as well as regarding the type of measures and designs that influence these effect sizes (McCartney and Rosenthal, 2000; Durlak et al., 2022).

Data was processed with IBM SPSS Statistics (Statistical Package for the Social Sciences), version 28, and analyzed with Stata Statistical Software, version 17.

8 Results

8.1 Evidence of experimental impacts of the academies in SSES

Table 4 summarizes the experimental results of 8 Academies in 13 subscales of the SSES – Child/Youth form and 7 subscales of the SSES - Teacher form, presenting the number of Academies and participants in each model, the difference between the adjusted means for intervention versus control groups, level of statistical significance of the group difference, and effect size.

Overall, experimental evidence of positive (i.e., in favor of the intervention group) and significant results of the Academies were found in four (out of 19) subscales of the SSES. There was also experimental evidence of negative (i.e., in favor of the control group) and significant results of the Academies in one subscale of the SSES. Effect sizes ranged from −0.211 (Tolerance, Child/Youth form) to 1.307 (Tolerance, Teacher form).

Specifically, in the SSES – Child/Youth form, we found significant positive impacts of the Academies on the Curiosity subscale ($p = 0.001$, $d = 0.151$), and significant negative impacts on the Tolerance subscale ($p = 0.019$, $d = -0.211$). In the SSES – Teacher form, we found significant positive impacts of the Academies on the Responsibility subscale ($p = 0.024$, $d = 0.639$), on the Curiosity subscale ($p = 0.013$, $d = 0.149$), and on the Tolerance subscale ($p = 0.000$, $d = 1.307$).

8.2 Evidence of quasi-experimental impacts of the academies in SSES

Table 5 summarizes the quasi-experimental results of the Academies in 14 subscales of the SSES – Child/Youth form and 14 subscales of the SSES - Teacher form, presenting the number of Academies and participants in each model, the difference between the adjusted means for intervention versus control groups, level of statistical significance of the group difference, and effect size.

Overall, quasi-experimental evidence of positive (i.e., in favor of the intervention group) and significant results of the Academies were found in 9 (out of 28) subscales of the SSES. There was also experimental evidence of negative (i.e., in favor of the control group) and significant results of the Academies in one subscale of the SSES. Effect sizes ranged from −0.145 (Curiosity, Teacher form) to 0.270 (Tolerance, Teacher form).

Specifically, in the SSES – Child/Youth form, we found one significant positive impact of the Academies on the Assertiveness subscale ($p = 0.000$, $d = 0.186$). In the SSES – Teacher form, we found significant positive impacts of the Academies on the Optimism subscale (p. = 0.000, $d = 0.153$), on the Emotional Control subscale ($p = 0.015$, $d = 0.167$), on the Self-control subscale ($p = 0.002$, $d = 0.156$), on the Cooperation subscale ($p = 0.009$, $d = 0.110$), on the Sociability subscale ($p = 0.000$, $d = 0.198$), on the Assertiveness subscale ($p = 0.002$, $d = 0.189$), on the Persistence/Perseverance subscale ($p = 0.023$, $d = 0.102$), and on the Tolerance subscale ($p = 0.000$, $d = 0.207$). We also found a one significant negative impact of the Academies on the Curiosity subscale ($p = 0.001$, $d = -0.145$).

9 Discussion

This paper aimed at testing the impact of a set of SEL focused interventions – the Gulbenkian Academies for Knowledge – on the social and emotional skills of their child and youth participants on a standardized measure of SEL, the OECD Survey of Social and Emotional Skills (SSES).

Experimental evidence of positive (i.e., in favor of the intervention group) and significant results of 8 Academies were found in 21% of the measured skills for both SSES versions (1 in a total of 13 subscales for the Child/Youth form, and 3 in a total of 7 for the Teacher form). Specifically, significant positive results were found for Curiosity as reported by the child and youth participants, and for Responsibility, Curiosity, and Tolerance from the perspective of teachers.

Quasi-experimental evidence depicts a more favorable picture of the results of the Academies. Quasi-experimental evidence of positive (i.e., in favor of the intervention group) and significant results of 32 Academies were found in 42% of the measured skills for both SSES versions (1 in a total of 14 subscales for the Child/Youth form, and 7 in a total of 14 for the Teacher form). Specifically, significant positive results were found for Assertiveness as reported by the child and youth participants, and for Optimism, Emotional Control, Self-control, Cooperation, Assertiveness, Persistence/Perseverance, and on Tolerance from the perspective of teachers.

Evidence of positive (i.e., in favor of the intervention group) and significant impacts of the Academies were consistent for the teacher and child/youth perspective, particularly for Curiosity in the experimental trials, and Assertiveness in the quasi-experimental evidence. Further interpretation of this pattern of results is important. Curiosity and Assertiveness may be more amenable to change, or it may be easier for teachers and other practitioners to target their interventions to these skills, and if so, maybe we should focus our SEL interventions in such skills. It is also possible that change in these two skills is easier to notice, and measure (Duckworth and Yeager, 2015). More research is needed to understand why change is observed so consistently in these two particular skills.

Globally, results meet what several meta-analyses and literature reviews on the effects of SEL interventions have been finding: these programs tend to generate small effect sizes, with not always

TABLE 4 Experimental impacts for Academies, comparing intervention and control groups, using multilevel models controlling for the score on each subscale at pre-test, as well as participants' sociodemographic characteristics[a] and clustering for Academies (*N* Academies = 8; *N* Participants = 4,460).

Outcome variable	*N* academies	*N* participants	Mean diff.	Sig.	Effect size
SSES – Child form (OECD, 2018).					
Adaptability					
Optimism (OPT)	2	173	−0.124	0.232	−0.220
Responsibility (RES)	2	173	−0.163	0.105	−0.239
Curiosity (CUR)	3	386	0.455	0.001	0.359**
Self-regulation					
Emotional control (EMO)	3	733	−0.065	0.213	−1.465
Self-control (SEL)	2	434	−0.077	0.209	−0.111
Communication					
Cooperation (COO)	5	731	0.037	0.288	0.067
Sociability (SOC)	4	432	0.070	0.082	0.161
Assertiveness (ASS)	3	219	0.076	0.465	0.093
Creative thinking					
Creativity (CRE)	5	602	−0.038	0.587	−0.042
Resilience					
Persistence (PER) [b]	1	213	−0.080	0.417	−0.096
Problem solving					
Empathy (EMP)	7	1,013	0.006	0.848	0.011
Tolerance (TOL)	5	501	−0.117	0.019	−0.211*
Trust (TRU)	6	714	−0.066	0.132	−0.092
SSES – Teacher Form (OECD, 2018).					
Adaptability					
Optimism (OPT)	2	133	0.346	0.052	0.489
Responsibility (RES)	2	133	0.381	0.024	0.639*
Curiosity (CUR)	2	133	0.452	0.013	0.149*
Self-regulation					
Emotional control (EMO) [b]	1	110	0.140	0.307	0.130
Communication					
Cooperation (COO)	2	168	−0.083	0.486	−0.094
Problem solving					
Empathy (EMP)	3	243	−0.075	0.341	−0.118
Tolerance (TOL)	2	133	0.762	0.000	1.307***

*$p < 0.05$; **$p < 0.01$; ***$p < 0.001$. [a]All models control for sociodemographic characteristics of participants (i.e., child's age, school grade, gender, nationality, whether the child has special educational needs, is in pre-school, attends public school, has failed a school year), their families (mom and dad's nationality, age, completed schooling, and whether each one works, and is married) and household (how many sources of social aid, whether the child has siblings and how many, whether child lives with parents, and in an urban area). [b]These models were fit using multivariate regression due to data limitations.

significant but generally positive results (e.g., Clarke et al., 2015; Tanner-Smith et al., 2018). Small positive effect sizes in previous literature may be a function of the diversity of SEL interventions, i.e., in terms of domains, contexts, targeted age groups, and dimensions of implementation such as dosage and frequency of sessions. The diversity in program characteristics and implementation dimensions observed across Academies in this study mirrors the SEL field of intervention, where artistic, educational, and cultural approaches (among others) are proposed side-by-side as opportunities for changing children and youth's SEL paths of development. This richness of proposed interventions is welcomed by community and educational institutions, including in the Academies. However, it is also likely that such diversity in approaches adds noise to program evaluation results, limiting their interpretation as to what exactly is promoting SEL change.

Also, literature suggests non-randomized evaluation designs (i.e., quasi-experimental studies) tend to overestimate effect sizes (Cheung and Slavin, 2016; Corcoran et al., 2018), which adds to need for caution when interpreting these results of the Academies employing quasi-experimental methods.

The triangulation of informants also stands as a strong point of this research, combining the voices of children/youth and teachers as

TABLE 5 Quasi-experimental impacts for academies, comparing intervention and comparison groups, using multilevel models controlling for the score on each subscale at pre-test, as well as participants' sociodemographic characteristics[a] and clustering for Academies (*N* Academies = 32; *N* Participants = 14,274).

Outcome variable	*N* academies	*N* participants	Mean diff.	Sig.	Effect size
SSES – Child form (OECD, 2018).					
Adaptability					
Optimism (OPT)	10	1,547	−0.047	0.220	−0.064
Responsibility (RES)	9	1,490	−0.029	0.409	−0.044
Curiosity (CUR)	14	2,149	−0.026	0.269	−0.045
Self-regulation					
Emotional control (EMO)	10	1,313	−0.029	0.480	−0.038
Self-control (SEL)	12	1,842	0.034	0.262	0.051
Communication					
Cooperation (COO)	20	3,154	0.025	0.173	0.048
Sociability (SOC)	15	2,126	0.015	0.510	0.028
Assertiveness (ASS)	13	1,930	0.170	0.000	0.186***
Creative thinking					
Creativity (CRE)	15	1,893	−0.021	0.477	−0.034
Resilience					
Persistence (PER)	12	1,909	0.033	0.262	0.049
Resilience (STR)	7	1,383	0.004	0.915	0.005
Problem solving					
Empathy (EMP)	19	2,678	0.023	0.288	0.040
Tolerance (TOL)	14	1,936	−0.004	0.880	−0.007
Trust (TRU)	14	1,911	0.065	0.052	0.085
SSES – Teacher form (OECD, 2018).					
Adaptability					
Optimism (OPT)	8	1,601	0.104	0.000	0.153***
Responsibility (RES)	8	1,643	−0.003	0.939	−0.003
Curiosity (CUR)	12	2,040	−0.094	0.001	−0.145**
Self-regulation					
Emotional control (EMO)	5	901	0.161	0.017	0.167*
Self-control (SEL)	8	1,267	0.142	0.002	0.156**
Communication					
Cooperation (COO)	14	2,179	0.080	0.009	0.110**
Sociability (SOC)	11	1,733	0.152	0.000	0.198***
Assertiveness (ASS)	9	1,211	0.199	0.002	0.189**
Creative thinking					
Creativity (CRE)	11	1,608	−0.020	0.639	−0.024
Resilience					
Persistence (PER)	9	1,453	0.101	0.023	0.102*
Resilience (STR)	5	896	−0.031	0.526	−0.037
Problem solving					
Empathy (EMP)	11	1,829	0.054	0.070	0.077
Tolerance (TOL)	9	1,457	0.233	0.000	0.270***

*$p < 0.05$; **$p < 0.01$; ***$p < 0.001$. [a]All models control for sociodemographic characteristics of participants (i.e., child's age, school grade, gender, nationality, whether the child has special educational needs, is in pre-school, attends public school, has failed a school year), their families (mom and dad's nationality, age, completed schooling, and whether each one works, and is married) and household (how many sources of social aid, whether the child has siblings and how many, whether child lives with parents, and in an urban area).

direct and indirect participants (respectively) of these interventions. This ensures greater rigor, quality, and security in the results, while also allowing for a wider picture of how social and emotional skills develop in children and young people engaged in SEL interventions. For example, a closer look at effect sizes shows they tend to be larger for the Teacher form. This may be due to teachers' expectations towards the interventions, and their overall positive feedback towards the programs and the subsequent perceived positive changes in their students. Research also mentions children are usually more critical towards their own social and emotional development after being exposed to explicit SEL content and acquiring knowledge on what these skills are, how they translate into daily behavior, and their own limitations in these competences (e.g., OECD, 2021b; Martinsone et al., 2022).

Impact results also prompt a reflection on how social and emotional skills develop: literature has shown that these skills develop at different paces, in a non-linear form, with oscillations throughout childhood and adolescence (OECD, 2021b).

9.1 Implications for research, practice and policy

The need to employ rigorous methods to evaluate the impact of interventions on social and emotional skills has been highlighted in the national (e.g., Cristóvão et al., 2017) and international literature (e.g., Durlak et al., 2011; Corcoran et al., 2018; Kankaraš and Suarez-Alvarez, 2019; Kankaraš et al., 2022). The growing recognition of the value and importance of social and emotional skills is accompanied by an insufficient knowledge on "what works" to improve them. Despite the investment in implementing SEL programs in Portugal getting increasingly valued, there is still the need to maximize the investment by measuring the quality of the large number of programs already being implemented, as well as their impacts in a rigorous manner (Cristóvão et al., 2017).

However, setting high standards is not enough. The Academies example demonstrated that, even when given support and some degree of pressure to implement rigorous methods of evaluation, education and community programs are not ready to implement such methods and opt for studies with weaker methodological rigor. The impact of the COVID19 epidemic cannot be underestimated in this choice. However, even programs implemented after the pandemic choosing quasi-experimental designs now face problems interpreting results, given the differences found between intervention and comparison groups in terms of their sociodemographic characteristics. It can be interpreted from these differences that these groups are not fully equivalent in expectation (Murnane and Willett, 2011), increasing limitations for the interpretation of the results of this study.

In educational and community settings, opting for quasi-experimental designs is frequent, mostly because selecting samples by convenience is less disruptive to the normal daily functioning of a school or community service, and raises fewer ethical concerns. Considering that only rigorous methods, such as randomized control trials, allow to effectively attribute the observed effects to the interventions being evaluated, researchers and policymakers must consider the importance of the training and capacity building of SEL professionals on basic program evaluation skills, as well as providing enough time and resources for the implementation of these skills, so that investment leads to an increase in evidence-based policies and practices for educational, social, and community interventions on SEL.

Challenges also remain in evaluating social and emotional skills. The Portuguese Gulbenkian Foundation opted by standardizing assessment by providing access to one common measure of impact across Academies - the SSES (OECD, 2021a; Castro et al., 2023). The benefits in promoting rigorous and quality impact measurement were considerable (Chernyshenko et al., 2018), but there were also some limitations.

First, the field of social and emotional skills still offers several conceptual challenges and methodological constraints, which are felt by professionals in the field. First, SEL domains and subdomains are very distinct, there is no common theory for each skill and there is often considerable confusion over terminology (Duckworth and Yeager, 2015). For example, different theoretical frameworks often use similar terms to describe distinct skills, and different terms to describe similar skills (Schoon, 2021). This means two programs which intend to measure their impact on resilience may, in fact, mean very distinct, incomparable constructs.

Second, there is no common metrics available to measure most skills. For instance, different instruments may measure different developmental stages of creative thinking during adolescence, and the current literature lacks validation studies which allow the horizontal comparison between these measures (Humphrey et al., 2011).

Third, SEL competencies have different developmental speeds, with some progressing more quickly than others. Cognitive self-regulation, for example, progresses fast during the pre-school years (i.e., ages 3 to 5), whereas adaptability skills may have smaller expected development during the same stage. The direct comparison of two programs with the same target group but which promote different skills, would favor the intervention targeting, in our example, cognitive self-regulation.

Fourth, these skills also develop at different paces during childhood and adolescence, making it inadequate to compare the impact of a program in a certain skill during childhood and another program targeting the same skill during the teenage years.

Fifth, SEL skills develop often in a non-linear manner (i.e., very rapidly in the early years, and then slower for a while; or the opposite), and in sudden leaps. This implies longer interventions, working on an evidence-based set of skills, may see more favorable results than shorter interventions, although the duration of an intervention itself also does not bring more impacts in a linear manner. These measurement issues cannot be addressed in our study due to data limitations, and present further challenges in the interpretation of results.

Finally, given that our outcome measure - SSES - is a report measure, it offers particular methodological constraints (e.g.: Murano et al., 2021). Because it is based on perceptions, results may be influenced by the fact that some skills may be easier to report than others, students and teachers may differ in their comparison terms, or there may be a considerable social desirability effect. The development of measures of direct observation, performance tasks, or task-oriented tools, is thus a priority for the field of SEL measurement, particularly to allow for methodological triangulation and practice improvement (Duckworth and Yeager, 2015).

All these challenges require an investment from the scientific community, in order for the evaluation process of programs targeting the development of social and emotional skills to be effective and rigorous.

9.2 Conclusion

The impact evaluation of the Gulbenkian Academies for Knowledge has the potential to support considerable changes in the field of SEL interventions, nationally and internationally. Internationally, it contributes to a deeper discussion of evidence-based SEL intervention developed locally and from the ground-up, and taking place in educational and community settings. Locally, the initiative offered an incentive and a model of capacity building at a national scale for hundreds of SEL professionals, creating a cascading, sustainable and long-lasting effect in practices. These teams are now more likely to apply the new program evaluation knowledge and skills to their daily practices, and bring about answers (and new questions) to the growing knowledge of how these skills develop in children and youth, and on what works to its effective promotion.

Data availability statement

The data analyzed in this study are subject to the following licenses/restrictions: Data was the property of the Academies, not ours. Requests to access these datasets should be directed to pgconhecimento@gulbenkian.pt.

Ethics statement

The studies involving humans were approved by Calouste Gulbenkian Foundation. The studies were conducted in accordance with the local legislation and institutional requirements. Written informed consent for participation in this study was provided by the participants' legal guardians/next of kin.

Author contributions

MB: Conceptualization, Data curation, Formal analysis, Funding acquisition, Methodology, Project administration, Supervision, Writing – original draft, Writing – review & editing. JA: Conceptualization, Supervision, Writing – original draft. CCa: Data curation, Project administration, Writing – original draft. CCo: Data curation, Project administration, Writing – original draft.

Funding

The author(s) declare financial support was received for the research, authorship, and/or publication of this article. All authors were funded by the Calouste Gulbenkian Foundation for the monitoring and evaluation work developed with the Academies. MB was funded by the Portuguese Foundation for Science and Technology (FCT) through the CEEC institutional funding (CEECINST/00126/2021). CCa was funded by an FCT doctoral grant (UI/BD/154443/2022).

Acknowledgments

The authors would like to thank all Academies, their participants and families, as well as the Calouste Gulbenkian Foundation, for contributing to making this work possible. We would also like to thank all academies that agreed to share the anonymized data for this paper, especially the Academy associated with the Universidade Portucalense.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Publisher's note

Supplementary material

The Supplementary material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/feduc.2023.1287259/full#supplementary-material

References

Alexandre, J., and Barata, M. C. (2020). "Intervenção comunitária com crianças e jovens em risco" in *A Prática Profissional da Psicologia da Justiça*. eds. R. Barroso and D. Neto. Ordem dos Psicólogos Portugueses. ISBN 978-989-54623-5-3 (print). Available at: https://www.ordemdospsicologos.pt/ficheiros/documentos/pratica_profissional_da_psicologia_na_justica.pdf (Accessed January 7, 2024).

Blewitt, C., Fuller-Tyszkiewicz, M., Nolan, A., Bergmeier, H., Vicary, D., Huang, T., et al. (2018). Social and emotional learning associated with universal curriculum-based interventions in early childhood education and care centers: a systematic review and meta-analysis. *JAMA Netw. Open* 1:e185727. doi: 10.1001/jamanetworkopen.2018.5727

Boncu, A., Costea, I., and Minulescu, M. (2017). A meta-analytic study investigating the efficiency of socio-emotional learning programs on the development of children and adolescents. *Rom. J. Appl. Psychol.* 19, 35–41. doi: 10.24913/rjap.19.2.02

Boudett, K. P., City, E. A., and Murnane, R. J. (2020). *Data wise revised and expanded edition: a step-by-step guide to using assessment results to improve teaching and learning*. Cambridge, MA, USA: Harvard Education Press.

Boudett, K. P., and Steele, J. L. (2007). *Data wise in action: Stories of schools using data to improve teaching and learning*. Cambridge, MA, USA: Harvard Education Press.

CASEL, (2020). Casel's sel framework: what are the core competence areas and where are they promoted? CASEL. Available at: https://casel.org/casel-sel-framework-11-2020/ (Accessed July 17, 2023).

Castro, C., Barata, C., Alexandre, J., and Colaço, C. (2023). Validation of a community-based application of the Portuguese version of the survey on social and emotional skills–child/youth form. *Front. Psychol.* 14:1214032. doi: 10.3389/fpsyg.2023.1214032

Cefai, C., Bartolo, P., Cavioni, V., and Downes, P., (2018). *Strengthening social and emotional education as a core curriculum area across the EU: a review of the international evidence. NESET II report*, Luxembourg: Publications Office of the European Union.

Cefai, C., Miljević-Riđički, R., Bouillet, D., Pavin Ivanec, T., Matsopoulous, A., Gavogiannaki, M., et al. (2015). *RESCUR surfing the waves. A resilience curriculum for early years and primary schools. A teachers' guide*. Malta: Centre for Resilience and Socio-Emotional Health, University of Malta.

Chernyshenko, O. S., Kankaraš, M., and Drasgow, F., (2018). Social and emotional skills for student success and well-being: Conceptual framework for the OECD study on social and emotional skills. Paris, France: OECD education working papers.

Cheung, A. C. K., and Slavin, R. E. (2016). How methodological features affect effect sizes in education. *Educ. Res.* 45, 283–292. doi: 10.3102/0013189X16656615

Cipriano, C., Strambler, M. J., Naples, L. H., Ha, C., Kirk, M., Wood, M., et al. (2023). The state of evidence for social and emotional learning: a contemporary meta-analysis of universal school-based SEL interventions. *Child Dev.* 94, 1181–1204. doi: 10.1111/cdev.13968

Clarke, A. M., Morreale, S., Field, C. A., Hussein, Y., and Barry, M. M. (2015). *What works in enhancing social and emotional skills development during childhood and adolescence? A review of the evidence on the effectiveness of school-based and out-of-school programmes in the UK*. National University of Ireland, Galway, Ireland: WHO Collaborating Centre for Health Promotion Research. Available at: https://aran.library.nuigalway.ie/bitstream/handle/10379/4981/Review_of_Social_and_Emotional_Skills-Based_Intervention_Report_(WEB_VERSION).pdf?sequence=1 (Accessed January 7, 2024).

Coelho, V., and Figueira, A. P. (2011). Project "positive attitude": promoting school success through social and emotional abilities development – design for elementary and middle school students, in Portugal. *Int. J. Psychol.* 45, 185–192.

Coelho, V., Marchante, M., and Brás, P. (2023). Positive attitude upper middle school social and emotional learning program: influences of implementation quality on program outcome. *Front. Psychol.* 14:2517. doi: 10.3389/fpsyg.2023.1172517

Cohen, J., (1988). *Statistical power analysis for the behavioral sciences* (*2nd Edn.*). Hillside, NJ: Lawrence Erlbaum Associates.

Corcoran, R. P., Cheung, A. C. K., Kim, E., and Xie, C. (2018). Effective universal school-based social and emotional learning programs for improving academic achievement: a systematic review and meta-analysis of 50 years of research. *Educ. Res. Rev.* 25, 56–72. doi: 10.1016/j.edurev.2017.12.001

Cristóvão, A. M., Candeias, A. A., and Verdasca, J. (2017). Social and emotional learning and academic achievement in Portuguese schools: a bibliometric study. *Front. Psychol.* 8:1913. doi: 10.3389/fpsyg.2017.01913

Domitrovich, C., Durlak, J., Staley, K., and Weissberg, R. (2017). Social-emotional competence: an essential factor for promoting positive adjustment and reducing risk in school children. *Child Dev.* 88, 408–416. doi: 10.1111/cdev.12739

Domitrovich, C. E., Li, Y., Mathis, E. T., and Greenberg, M. T. (2019). Individual and organizational factors associated with teacher self-reported implementation of the PATHS curriculum. *J. Sch. Psychol.* 76, 168–185. doi: 10.1016/j.jsp.2019.07.015

Duckworth, A. L., and Yeager, D. S. (2015). Measurement matters: assessing personal qualities other than cognitive ability for educational purposes. *Educ. Res.* 44, 237–251. doi: 10.3102/0013189X15584327

Durlak, J. A., Mahoney, J. L., and Boyle, A. E. (2022). What we know, and what we need to find out about universal, school-based social and emotional learning programs for children and adolescents: a review of meta-analyses and directions for future research. *Psychol. Bull.* 148, 765–782. doi: 10.1037/bul0000383

Durlak, J. A., Weissberg, R. P., Dymnicki, A. B., Taylor, R. D., and Schellinger, K. B. (2011). Enhancing students' social and emotional development promotes success in school: results of a meta-analysis. *Child Dev.* 82, 405–432. doi: 10.1111/j.1467-8624.2010.01564.x

Durlak, J. A., Weissberg, R. P., and Pachan, M. (2010). A meta-analysis of after-school programs that seek to promote personal and social skills in children and adolescents. *Am. J. Community Psychol.* 45, 294–309. doi: 10.1007/s10464-010-9300-6

Espírito-Santo, H., and Daniel, F. (2015). Calcular e apresentar tamanhos do efeito em trabalhos científicos: as limitações do $p<0.05$ na análise de diferenças de médias de dois grupos. *Revista Portuguesa de Investigação Comportamental e Social* 1, 3–16. doi: 10.7342/ismt.rpics.2015.1.1.14

Fernández-Martín, F.-D., Romero-Rodríguez, J.-M., Marín-Marín, J.-A., and Gómez-García, G. (2021). Social and emotional learning in the ibero-american context: a systematic review. *Front. Psychol.* 12:738501. doi: 10.3389/fpsyg.2021.738501

Flay, B. R., and Allred, C. G. (2010). "The positive action program: improving academics, behavior, and character by teaching comprehensive skills for successful learning and living" in *International research handbook on values education and student wellbeing* (New York, NY: Springer Science + Business Media), 471–501.

Fossum, S., Handegård, B. H., and Britt Drugli, M. (2017). The incredible years teacher classroom management programme in kindergartens: effects of a universal preventive effort. *J. Child Fam. Stud.* 26, 2215–2223. doi: 10.1007/s10826-017-0727-3

Goldberg, L. R. (1990). An alternative "description of personality": the big-five factor structure. *J. Pers. Soc. Psychol.* 59, 1216–1229. doi: 10.1037/0022-3514.59.6.1216

Goldberg, J. M., Sklad, M., Elfrink, T. R., Schreurs, K. M. G., Bohlmeijer, E. T., and Clarke, A. M. (2019). Effectiveness of interventions adopting a whole school approach to enhancing social and emotional development: a meta-analysis. *Eur. J. Psychol. Educ.* 34, 755–782. doi: 10.1007/s10212-018-0406-9

Gormley, W., Gayer, T., Phillips, D., and Dawson, B. (2005). The effects of universal pre-K on cognitive development. *Dev. Psychol.* 41, 872–884. doi: 10.1037/0012-1649.41.6.872

Green, A. L., Ferrante, S., Boaz, T. L., Kutash, K., and Wheeldon-Reece, B. (2021). Social and emotional learning during early adolescence: effectiveness of a classroom-based SEL program for middle school students. *Psychol. Sch.* 58, 1056–1069. doi: 10.1002/pits.22487

Humphrey, N., Kalambouka, A., Wigelsworth, M., Lendrum, A., Deighton, J., and Wolpert, M. (2011). Measures of social and emotional skills for children and young people: a systematic review. *Educ. Psychol. Meas.* 71, 617–637. doi: 10.1177/0013164410382896

James-Burdumy, S., Dynarski, M., Moore, M., Deke, J., Mansfield, W., and Pistorino, C., (2005). When schools stay open late: the National Evaluation of the 21st century community learning centers program: Final report. U.S. Department of Education, Institute of Education Sciences, National Center for education evaluation and regional assistance. Available at http://www.ed.gov/ies/ncee

Jones, S. M., McGarrah, M. W., and Kahn, J. (2019). Social and emotional learning: a principled science of human development in context. *Educ. Psychol.* 54, 129–143. doi: 10.1080/00461520.2019.1625776

Judge, T. A., Bono, J. E., Ilies, R., and Gerhardt, M. W. (2002). Personality and leadership: a qualitative and quantitative review. *J. Appl. Psychol.* 87, 765–780. doi: 10.1037/0021-9010.87.4.765

Kankaraš, M., de Fruyt, F., and Primi, R. (2022). Editorial: theory and empirical practice in research on social and emotional skills. *Front. Educ.* 7:993878. doi: 10.3389/feduc.2022.993878

Kankaraš, M., and Suarez-Alvarez, J., (2019). Assessment framework of the OECD study on social and emotional skills (OECD education working papers no. 207), Paris, France: OECD education working papers. doi: 10.1787/5007adef-en

Kotsiou, A., Fajardo-Tovar, D. D., Cowhitt, T., Major, L., and Wegerif, R. (2022). A scoping review of future skills frameworks. *Irish Educ. Stud.* 41, 171–186. doi: 10.1080/03323315.2021.2022522

Kraft, M. A. (2020). Interpreting effect sizes of education interventions. *Educ. Res.* 49, 241–253. doi: 10.3102/0013189X20912798

Kremer, K. P., Maynard, B. R., Polanin, J. R., Vaughn, M. G., and Sarteschi, C. M. (2015). Effects of after-school programs with at-risk youth on attendance and externalizing behaviors: a systematic review and meta-analysis. *J. Youth Adolesc.* 44, 616–636. doi: 10.1007/s10964-014-0226-4

Kusché, C. A., and Greenberg, M. T., (1994). *The PATHS curriculum*. Seattle, Washington, DC: Development Research and Programs.

Low, S., Smolkowski, K., and Cook, C. (2016). What constitutes high-quality implementation of sel programs? A latent class analysis of second step® implementation. *Prev. Sci.* 17, 981–991. doi: 10.1007/s11121-016-0670-3

Martinsone, B., Supe, I., Stokenberga, I., Damberga, I., Cefai, C., Camilleri, L., et al. (2022). Social emotional competence, learning outcomes, emotional and behavioral difficulties of preschool children: parent and teacher evaluations. *Front. Psychol.* 12:760782. doi: 10.3389/fpsyg.2021.760782

McCartney, K., and Rosenthal, R. (2000). Effect size, practical importance, and social policy for children. *Child Dev.* 71, 173–180. doi: 10.1111/1467-8624.00131

Murano, D., Lipnevich, A. A., Walton, K. E., Burrus, J., Way, J. D., and Anguiano-Carrasco, C. (2021). Measuring social and emotional skills in elementary students: development of self-report Likert, situational judgment test, and forced choice items. *Personal. Individ. Differ.* 169:110012. doi: 10.1016/j.paid.2020.110012

Murnane, R., and Willett, J., (2011). *Methods matter: Improving causal inference in educational and social science research*. Oxford University Press, Oxford, New York.

OECD (2018). *Social and Emotional Skills: Well-being, connectedness and success*. OECD Publishing. Available at: https://www.oecd.org/education/school/UPDATED%20Social%20and%20Emotional%20Skills%20-%20Well-being,%20connectedness%20and%20success.pdf%20(website).pdf (Accessed July 17, 2023).

OECD (2021a). Beyond academic learning: first results from the survey of social and emotional skills 2019. Paris, France: OECD Publishing.

OECD, (2021b). *OECD survey on social and emotional skills: technical report*. Paris, France: OECD Publishing.

Raimundo, R. (2007). *Programa de desenvolvimento de competências sócio-emocionais: Devagar se vai ao longe [Social and emotional learning program: Slowly but steadily]* Unpublished manual.

Raimundo, R., Marques-Pinto, A., and Lima, M. L. (2013). The effects of a social–emotional learning program on elementary school children: the role of pupils' characteristics. *Psychol. Sch.* 50, 165–180. doi: 10.1002/pits.21667

Sackett, P. R., and Walmsley, P. T. (2014). Which personality attributes are most important in the workplace? *Perspect. Psychol. Sci.* 9, 538–551. doi: 10.1177/1745691614543972

Santos, A. C., (2022). *Health promotion and school engagement in youth: The influence of social and emotional competencies. Thesis presented for a double degree of doctor in education in the expertise of health education and in school psychology and human development*, Faculdade de Motricidade Humana, Lisboa.

Sawilowsky, S. (2009). New effect size rules of thumb. *J. Mod. Appl. Stat. Methods* 8, 597–599. doi: 10.22237/jmasm/1257035100

Schoon, I. (2021). Towards an integrative taxonomy of social-emotional competences. *Front. Psychol.* 12:515313. doi: 10.3389/fpsyg.2021.515313

Schwartz, H. L., Hamilton, L. S., Faxon-Mills, S., Gomez, C. J., Huguet, A., Jaycox, L. H., et al. (2020). *Early lessons from schools and out-of-school time*

programs implementing social and emotional learning. Santa Monica, CA: RAND Corporation. Available at: https://www.rand.org/pubs/research_reports/RRA379-1.html.

Scorza, P., Araya, R., Wuermli, A. J., and Betancourt, T. S. (2016). Towards clarity in research on "non-cognitive" skills: linking executive functions, self-regulation, and economic development to advance life outcomes for children. *Adolesc. Youth Glob. Hum. Dev.* 58, 313–317. doi: 10.1159/000443711

Strickhouser, J., Zell, E., and Krizan, Z. (2017). Does personality predict health and well-being? A metasynthesis. *Health Psychol.* 36, 797–810. doi: 10.1037/hea0000475

Tanner-Smith, E. E., Durlak, J. A., and Marx, R. A. (2018). Empirically based mean effect size distributions for universal prevention programs targeting school-aged youth: a review of meta-analyses. *Prev. Sci.* 19, 1091–1101. doi: 10.1007/s11121-018-0942-1

Van de Sande, M. C., Fekkes, M., Kocken, P. L., Diekstra, R. F., Reis, R., and Gravesteijn, C. (2019). Do universal social and emotional learning programs for secondary school students enhance the competencies they address? A systematic review. *Psychol. Sch.* 56, 1545–1567. doi: 10.1002/pits.22307

Wallender, J., Hiebel, A. L., PeQueen, C. V., and Kain, M. A. (2020). Effects of an explicit curriculum on social-emotional competency in elementary and middle school students. *Delta Kappa Gamma Bullet.*, 32–43.

Webster-Stratton, C. (1981). Modification of mothers' behaviors and attitudes through videotape modeling group discussion program. *Behav. Ther.* 12, 634–642. doi: 10.1016/S0005-7894(81)80135-9

Webster-Stratton, C. (1982). Teaching mothers through videotape modeling to change their children's behaviors. *J. Pediatr. Psychol.* 7, 279–294. doi: 10.1093/jpepsy/7.3.279

Weiss, C. (1995). *Nothing as practical as good theory: Exploring theory-based evaluation for comprehensive community initiatives for children and families.* New approaches to evaluating community initiatives: Concepts, methods, and contexts, 1, 65–92.

Weissberg, R., Durlak, J., Domitrovich, C., and Gullotta, T.P., (2015). Social and emotional learning: past, present, and future. Handbook for social and emotional learning: Research and practice 3–19.

Wong, V. C., Cook, T. D., Barnett, W. S., and Jung, K. (2008). An effectiveness-based evaluation of five state pre-kindergarten programs. *J. Policy Anal. Manage.* 27, 122–154. doi: 10.1002/pam.2031

frontiers | Frontiers in Psychology

TYPE Original Research
PUBLISHED 21 February 2024
DOI 10.3389/fpsyg.2023.1198074

OPEN ACCESS

EDITED BY
Pedro Rosário,
University of Minho, Portugal

REVIEWED BY
Michael D. Broda,
Virginia Commonwealth University, United States
Louise Tracey,
University of York, United Kingdom

*CORRESPONDENCE
Maria Filomena Gaspar
✉ ninigaspar@fpce.uc.pt

RECEIVED 31 March 2023
ACCEPTED 20 June 2023
PUBLISHED 21 February 2024

CITATION
Gaspar MF, Seabra-Santos M, Relvão J, Pimentel M, Homem T, Azevedo AF and Moura-Ramos M (2024) Implementation in the "real world" of an evidence-based social and emotional learning program for teachers: effects on children social, emotional, behavioral and problem solving skills. *Front. Psychol.* 14:1198074. doi: 10.3389/fpsyg.2023.1198074

Implementation in the "real world" of an evidence-based social and emotional learning program for teachers: effects on children social, emotional, behavioral and problem solving skills

Maria Filomena Gaspar[1,2]*, Maria Seabra-Santos[1,3], Joana Relvão[1], Mariana Pimentel[1], Tatiana Homem[3], Andreia Fernandes Azevedo[3] and Mariana Moura-Ramos[3,4]

[1]Faculty of Psychology and Educational Sciences, University of Coimbra, Coimbra, Portugal, [2]Centre for Social Studies, University of Coimbra, Coimbra, Portugal, [3]Center for Research in Neuropsychology and Cognitive and Behavioral Intervention, University of Coimbra (CINEICC), Coimbra, Portugal, [4]Clinical Psychology Unit, Centro Hospitalar e Universitário de Coimbra, Coimbra, Portugal

Introduction: The delivery of social and emotional learning (SEL) programs that are developmentally school-based and evidence-based has the potential to benefit many children, and as such, greater efforts are needed to disseminate these programs more widely within the community. The Incredible Years® Teacher Classroom Management (IY-TCM) has shown promising results when applied by teachers in preschool centers and primary schools, as seen in several randomized control trials conducted worldwide, including in Portugal.

Methods: The current study presents a model of the implementation of the program within the framework of a nationwide initiative undertaken in Portugal: the Academias Gulbenkian do Conhecimento. Additionally, results of the program's impact on children were explored using ANOVA, which compared pre- to post- treatment outcomes. To assess which factors affected the efficacy of the intervention, moderation analyses were conducted using the MEMORE macro. Ninety teachers and 535 children (2 to 10 years old) were assessed.

Results: Results revealed that children showed significant increases in social and emotional skills (e.g., social adjustment, empathy) and significant reductions in problem behavior when assessed by their teachers, and in social-cognitive problem solving strategies as evaluated by a set of problem-solving tasks. Moderation analyses showed that, in general, interaction effects were not found, meaning that the intervention was effective for almost all conditions. Nevertheless, significant moderation effects were found for factors pertaining to the child and the mother with respect to pro-social and emotional skills (children who benefited most from the intervention exhibited more behavioral difficulties at the baseline according to the teachers' perceptions and had mothers without a university degree; children attending primary school took less benefit from the intervention than those attending pre-school).

Discussion: The findings contribute both to the reinforcement of the effectiveness of the IY-TCM program as a universal intervention in "real world" schools and to the development of some guidelines for the promotion of effective scaling up and sustainability of program effects.

KEYWORDS

social and emotional learning, school-based SEL intervention, fidelity, The Incredible Years® Teacher Classroom Management, Academias Gulbenkian do Conhecimento, implementation science

Introduction

Schools constitute a "universal access point" (Sanders et al., 2022, p. 949) from which interventions can be implemented to promote both the cognitive, emotional and social development of children and youth and their mental health. These interventions involve not only the children and youth in question, but also their families and the local communities (Clarke, 2019). As stated in the report entitled "Reimagining our future together" produced by the UNESCO International Commission on the Futures of Education (UNESCO, 2021, p. 4), schools have to be "protected educational sites because of the inclusion, equity and individual and collective well-being they support—and also reimagined to better promote the transformation of the world towards more just, equitable and sustainable futures." In assuming this role, they become central in the efforts to achieve some of the 17 United Nations Sustainable Development Goals (SDGs) (UNESCO, 2021; Sanders et al., 2022).

School-based interventions to promote social and emotional development, encompassed in the macro concept of "Social and emotional learning" (SEL), can be classified into 3 types, according to Clarke (2019): (1) whole-school intervention targeting the school as a whole and integrating a coordination between curriculum, school and family and community partnerships; (2) universal classroom skills-based intervention, for all students in a classroom; (3) targeted intervention, concentrating on students who present different types of risk factors that may compromise their mental health and well-being. The focus of this paper is the implementation of an evidence-based intervention, the Incredible Years® Teacher Classroom Management program (IY-TCM; Webster-Stratton, 2011a, 2012), at the classroom level for all children, even though it features contents that may address the specific needs of certain students (e.g., individual behavioral plans enabling the teacher to work with children who present more socioemotional difficulties in the classroom, involving their families and other school-based professionals). In this way, the program integrates the recommendation of "proportionate universalism" (Sanders et al., 2022, p. 945; Barry, 2019a, p. 38), as far as it is universal and inclusive, yet "calibrated proportionally" to the level of need or disadvantage (World Health Organization and Calouste Gulbenkian Foundation, 2014, p. 8).

Studying the implementation of evidence-based practices (EBP) in real-world schools is essential to informing successful implementation, and thus improving students' outcomes as intended and decreasing not just the "research-to-practice gap" in education (the EBP be adopted) but also the "implementation gap" (the EBP be implemented in schools routinely as planned) (Hagermoser Sanetti and Collier-Meek, 2019).

As Shonkoff (2017) stated in a commentary about the outcomes of early childhood interventions, not only have few programs been scaled effectively, but their effects also appear small to moderate with respect to important dimensions of child development. He thus argues that we need to redefine the criteria we use to classify a program as "evidence-based," removing the focus only from the analysis of statistically significant differences between a control group and an experimental group in randomized studies, and placing it more on causal models focused on mediating and moderating variables—that is, the "on-the-ground experience"—so that they can more effectively answer the questions focusing on which contexts, whether, for whom and to what extent the interventions achieve the intended effects (Shonkoff, 2017).

According to Proctor et al. (2011), it is essential to distinguish "treatment effectiveness" from "implementation effectiveness" in order to transport evidence-based practices or innovations to the community and services and to assess when failure occurs, whether it is due to the intervention's ineffectiveness in that context (intervention failure) or its incorrect implementation (implementation failure). On the assumption that "a critical yet unresolved issue in the field of implementation science is how to conceptualize and evaluate success" (Proctor et al., 2011, p. 65), they proposed a model to assess implementation success centered on what they called "implementation outcomes," which precede and are different from service system outcomes (e.g., effectiveness) and customer outcomes (e.g., satisfaction). Implementation outcomes encompass the effects of actions that have specific objectives and are undertaken intentionally in the implementation of new services, interventions, or practices. The authors developed an "implementation outcomes taxonomy" including eight different outcomes:

(1) Acceptability (satisfaction with aspects of the innovation); (2) adoption (initial decision or utilization or intention to try); (3) appropriateness (usefulness, perceived fit); (4) feasibility (practicability, suitability for use); (5) fidelity (i.e., delivered as intended by program developers, which includes: adherence to the program protocol, dosage, and quality of program delivery); (6) implementation cost (cost-benefit, cost-effectiveness); (7) penetration (integration at the level of the organization or setting); (8) sustainability (sustained use, maintenance, integration within the organization's culture).

The overarching aim of this paper is to document a model of implementation of an evidence-based SEL program, the IY-TCM, in real-word, school-based settings (preschools and primary schools in Portugal) under a broader national innovation initiative developed with the purpose of promoting the social and emotional competences of children and young people aged 25 and under: The Academias Gulbenkian do Conhecimento initiative of the Fundação Calouste Gulbenkian. Another objective is to assess implementation success through the effectiveness of the IY-TCM on improving children's social, emotional, behavioral and problem solving skills and considering different types of moderators: level of teachers' IY-TCM training (at the local community level by no experienced group-leaders from local entities; at the university level by experienced group-leaders); professional background of the participants involved

in the program's implementation with children (teachers versus other school-based professionals); educational system level of the classrooms where the intervention was implemented (preschool versus primary school); mother's level of education (primary or lower secondary; upper secondary; university degree); teachers' perceptions about the children's behavior (easy/average or difficult).

Study background

The Academias Gulbenkian do Conhecimento

The Fundação Calouste Gulbenkian (FCG) is a Portuguese private philanthropic institution whose main purpose is improving the quality of life through initiatives that support the arts, charitable endeavors, science and education.[1] In May 2018 the FCG launched an initiative—The Academias Gulbenkian do Conhecimento. The academies are institutional consortiums, involving non-profit public or private or social sector organizations, including, but not limited to, youth, cultural, and sports associations, NGOs, private social solidarity institutions, parents' associations, municipalities, schools, universities, and hospitals responsible for the implementation of projects ("methodologies") that would promote the social and emotional competences of children and young adults up to 25 years of age. Calls for proposals were opened in three consecutive years (2018, 2019 and 2020) with 100 projects, in different fields (culture, education, sports, health, solidarity or technology) selected and funded in every region of Continental Portugal and the autonomous regions of Madeira and the Azores.

Seven social and emotional competences were considered to be fundamental for children and young adults up to 25 to deal with sudden life changes, and were thus selected as the focus for the interventions[2]:

- Adaptability: adjusting to change by flexibly adapting their attitudes and behaviors;
- Self-regulation: being decisive, strategic and persistent in goals, evaluating progress and modifying behaviors as a result of that evaluation;
- Creativity: having a vision and generating new ways of thinking and doing, exploring and learning from error;
- Problem solving: realistically assessing problems, looking for alternatives, deciding and implementing solutions using creativity and logical thinking, keeping in mind the consequences for oneself and others;
- Critical thinking: valuing situations from multiple perspectives, breaking down problems into their components, and systematizing the path to resolution through new methods and processes, looking for causes or thinking through the consequences of the various possible courses of action;
- Resilience: handling adversity well and not giving up easily;
- Communication: initiating and maintaining social contacts, expressing opinions, needs or feelings appropriately.

Each academy applying for funding had to demonstrate how its project would contribute to the development of some of these seven competencies.

The academies could choose to apply to the implementation of one of two types of interventions ("methodologies"): (1) "reference methodology" selected *a priori* by the FCG and which had already proven its effectiveness in Portugal (a total of nine different methodologies in the three calls)[3]; (2) "experimental methodology," a new methodology whose effectiveness the academy wants to evaluate. The present paper is based on the work done within academies that used the Incredible Years® Teacher Classroom Management (IY-TCM), which was one of the three reference methodologies proposed in the first call.

The Incredible Years®, Teacher Classroom Management Program

The program: content, processes, implementation

The Incredible Years® Teacher Classroom Management (IY-TCM), one of the programs of Incredible Years® (IY) series of programs for teachers, parents and children, was developed by Webster-Stratton to support teachers of children aged 3 to 8 years to effectively manage the disruptive behavior in their classrooms by promoting socio-emotional learning and a positive relationship with children and their parents (Reinke et al., 2012). It has thus been classified as a SEL program (Sandilos et al., 2020) grounded in both social learning and coercion theories (McClelland et al., 2017), but also in attachment theory (Tveit et al., 2020) because of the strong emphasis it places on the quality of the teacher's relationship with the child. The program is organized around the following content components: strengthening of the teacher-student bond and home-school collaboration; classroom management skills, proactive teaching, effective discipline; academic persistence, social and emotional coaching with students; teaching social skills, anger management and problem-solving skills in class; individual behavior plans for children who exhibit some behavior difficulties; and building teacher support networks (Webster-Stratton, 2012).

The IY author developed a model of professional training and coaching that incorporates a guarantee of fidelity that increases the likelihood of implementation success. In fact, group leaders (or facilitators) who will deliver the program to teachers need to complete a 3 days training workshop, certified by the Incredible Years®, while participation in regular supervision with a coach or mentor in the program is also highly recommended by the author (Webster-Stratton and Bywater, 2015). Group-leaders training workshops can only be offered by "mentors" or "trainers" who themselves have followed a consistent training program that includes being certified as group-leader, having considerable experience delivering the program, and having completed training in coaching, supervision and workshop delivery skills (see https://incredibleyears.com/programs/implementation/ for more details). Mentors provide ongoing mentoring and supervision to group-leaders and work closely with the program author and participate regularly in international IY mentor meetings to improve their skills and guarantee they are familiar with and integrate in their trainings the latest improvements the author has introduced into the program content and processes.

1 https://gulbenkian.pt/en/the-foundation/the-foundation/

2 https://gulbenkian.pt/academias/competencias-alvo/

3 https://gulbenkian.pt/academias/publications/

The program is implemented by two trained group-leaders to groups of 14–16 preschool or primary school teachers, or other professionals working with children in educational environments, and is supported in a detailed Leader's Manual (Webster-Stratton, 2011b) and books. The training model integrates a collaborative, self-reflective, and experiential learning process, in which teachers share ideas, role-play practices and discuss and problem-solve situations presented on DVD vignettes (Webster-Stratton, 2011a). In each training session teachers are invited to set personal goals from a self-monitoring checklist and to complete a self-reflection inventory. Between sessions group-leaders offer individual support to teachers, both online and in their classrooms, to help them solve/reflect on implementation issues and other problems and support them in implementing the strategies. Teachers are stimulated to share experiences and ideas with other teachers both between sessions and at the beginning of each session, with the goal of building teacher support networks and promote peer to peer learning (Webster-Stratton, 2011b).

The model for teacher training recommends 42 to 48 h of training in six one-day monthly workshops, implemented throughout the school year (Webster-Stratton, 2012). However other implementation models are used with efficacy. For example, Carlson et al. (2011) reported eight 4 h sessions over an 8–10 weeks period for a total of 32 h of training, and Gaspar et al. (2022) reported six 6 h workshops once a month or every 3 weeks, interspersed with 2 hours individual in loco peer coaching. According to Korest and Carlson (2022), dosage should be calculated not considering the number of sessions, because of the varied number of sessions offered, but rather by the number of hours, coding as "high dosage" if the training offered lasts at least 42 h.

The IY-TCM as an evidence-based program

In different countries, the IY-TCM as a stand-alone school-based intervention showed promising benefits for both children and teachers. Results from a very recent meta-analysis—one designed both to assess the current state of evidence in improving teachers' and children's outcomes and to identify potential intervention moderators of the effects of the IY-TCM as a stand-alone program (Korest and Carlson, 2022)—revealed the program had moderate positive effects on teachers (use of positive and negative IY-TCM classroom management strategies) with larger effect sizes in higher dosage studies (training hours offered greater than or equal to 42 h). Considering the effects on children, the results indicated small positive effects on children's externalizing behavior and prosocial skills for teacher-rated reports, with larger effect sizes for higher risk children (behavioral problems above the clinical range defined by the study). The severity of child behavior (high risk and low risk), reporting methods (observation and teacher-rated), study design [randomized control trials (RCT) or quasi-experimental] and dosage (high = training hours offered greater than or equal to 42 h; low = less than 42 h) were the moderators analyzed, but because of the small sample only descriptive versus empirical analysis was possible. So the moderation results reported need to be read with caution. Sixteen studies (with a RCT or quasi-experimental design) from six countries (United States, United Kingdom, Ireland, Portugal, New Zealand, and Jamaica) were included.

In a previous mixed methods systematic review (Nye et al., 2019), the authors concluded that the program has the potential to provide a scalable public health solution to address both teachers' needs related with classroom management problems and children's social, emotional and behavioral needs, both in high-income countries (England, Ireland, Wales, United States) and in low-income countries (Jamaica). Results indicate a reduction in school violence related both with a reduction in teachers' use of negative strategies, and with the improvement in the behavior of higher risk children in the classroom.

The IY-TCM is listed in online registries hosted by government and non-governmental organizations and designed to inform investment decisions by policy makers and commissioners (e.g., Blueprints for Violence Prevention Model and Promising Programs, administered by the Center for the Study and Prevention of Violence at the University of Colorado; https://www.blueprintsprograms.org/; The European Platform for Investing in Children (EPIC), an evidence-based online platform that provides information about policies that can help children and their families face the challenges in the current economic climate in Europe; https://ec.europa.eu/social/main.jsp?catId=1246&langId=en).

In Portugal the first study with the IY-TCM was a universal prevention quasi-experimental study conducted within the scope of a doctoral dissertation (Vale, 2012). Its main aim was to establish preliminary evidence on the program's effectiveness in improving Portuguese children's social skills and behavioral difficulties at school and teacher practices and behaviors. A secondary aim was to assess its acceptability by teachers. Changes happened in the expected direction and were sustained over time (12 months follow-up) regarding both children's outcomes (including children with early signs of disruptive behavior), and teachers outcomes. High levels of teacher satisfaction with numerous aspects of the program were found. However, concerning the video clips, although teachers recognized their usefulness for stimulating discussion and modeling certain strategies, they thought that the videos did not adequately reflect the reality of young learners in Portuguese classrooms and therefore needed to be adapted (Vale, 2012). Seabra-Santos et al. (2018) conducted an RCT aiming to analyze the impact of the IY-TCM on social skills and behavior problems of economically disadvantaged preschoolers. After their teachers attended the IY-TCM training, children from the experimental group were rated with more social skills and fewer behavior problems. Moreover, higher improvements in social skills were found in children from economically disadvantaged families and with children at high risk because of their lower social skills. Within the same study, Gaspar et al. (2022) reported that teachers who participated in the IY-TCM showed an increased use of classroom management positive strategies and a reduced use of inappropriate ones. An impact on psychological variables was not found.

Considering that one of the key principles of practice to be followed in the implementation of innovations promoting mental health interventions is the selection of theoretical and evidence-based interventions (Barry, 2019b), the adoption of the IY-TCM by the FCG as a "reference methodology," whose implementation in Portugal they supported and funded, seems justified.

Method

Implementation design

To more fully inform those applying for the Academias Gulbenkian do Conhecimento 2018 grant as to the specific components and goals of the IY-TCM, it was natural that the promoter should approach the team responsible for the implementation and research of the IY-TCM in Portugal, based at the Faculdade de

Psicologia e de Ciências da Educação, Universidade de Coimbra (UC), to write a manual with the details of the intervention and implementation model (program contents, processes and goals; group-leader training; training to teachers and other school-based professionals who work with children; implementation support by the research team; outcomes and processes assessment model; program efficacy and effectiveness world-wide and in Portugal related with the expected results of the Academias Gulbenkian do Conhecimento in terms of improvement of social and emotional competencies of children) (The manual, in Portuguese, can be found in https://cdn.gulbenkian.pt/academias/wp-content/uploads/sites/43/2018/05/1.incredible_years.pdf).

The goal was to support applicants' informed selection of the methodology, considering their own needs and resources. This is particularly relevant because in the 2018 call the applicants could choose among either four "reference methodologies" or the implementation of a methodology selected by themselves ("experimental methodologies").

Seven applicants had their projects to implement the IY-TCM program approved. These academies had outlined projects with a variable duration, ranging from 12 to 36 months of implementation, which could be carried out either in preschools or in primary schools, and involved one of the following levels of training, or both: level (1) the teachers or other classroom-based professionals are trained by group-leaders from the academy who, in turn, have been trained by a program mentor from the university team; level (2) the teachers or other classroom-based professionals who will use the program with children in classrooms are trained directly by group-leaders from the university team. One of the academies chose to implement a project involving the two levels of training.

The implementation plan of the IY-TCM methodology followed 4 sequential steps:

Step 1. Formal agreement between the FCG and the UC concerning the tasks and duties of each one and the funding the former gives to the latter to do the training and provide the support needed for the successful implementation of the projects of the seven IY-TCM academies and also to conduct an evaluation of the implementation process and success.

Step 2. Face to face meeting between the promotor Agency (FCG—Academias Gulbenkian do Conhecimento), the coordinator Agency (UC), and the local Agencies coordinators (IY-TCM academies). The coordinator from the university presented the model of implementation of the IY-TCM methodology, the implementation support offered to academies and the assessment model of the implementation.

Step 3. Training of group leaders: only for the level 1 academies. Twenty-five professionals from the four level 1 academies (A1, A2, A3 and A4) participated in the 3-day leaders' training workshop at the UC. The training was delivered by two group leaders with extensive experience with the IY programs, one of whom was a mentor in training of the IY-TCM. The training followed the same collaborative model that the trainees were supposed to use when running teachers' groups.

During and after the certified training, the academies were closely supported by the university team: (1) to order the Portuguese version of the IY-TCM program materials (e.g., DVD, group leader manuals); (2) to establish a partnership with a local Center for Continuing Professional Development for Teachers, so that the teachers attending the IY program training might obtain professional credits for participating (given that in Portugal all the teachers, including preschool teachers, are encouraged to do certified continuing professional training in order to get professional credits to progress in their career); (3) to disseminate the IY-TCM program and the project in the local schools to recruit teachers that would volunteer to attend the program. Models of formal letters to the directors of school clusters, head teachers and teachers were made available.

Step 4. Program implementation to groups of teachers and other school-based professionals who work with classrooms: year 1.

Level 1 academies

The four academies disseminated the program in local community schools clusters, implementing it in schools to groups of teachers or other school-based professionals who worked with children in the classrooms. All teachers received professional credits for completing the program. All the four academies offered the 42 h of training in 7 monthly sessions of 6 h each, or in 14 sessions of 3 h each every 2 weeks. In the first year of implementation, all the workshops were administered in person; however, following the COVID-19 pandemic, two of the academies started to deliver online as well.

Before and during the first year of implementation, all the professionals trained in level 1 received the support from a member from the IY-TCM team based at the university. At least one supervision session took place face-to-face, which was attended either by all the group-leaders from the academy or from two academies in geographical proximity. Group-leaders were invited to take self and peer evaluations to the supervision session along with the evaluations of each session made by the teachers, at which point the collaborative problem-solving model recommended by the program author was followed. Online supervision sessions were also implemented with the same goal. At the end of the first year, after all the academies had finished the implementation of their first group, all the group-leaders were invited to participate in a focus group at the UC, in September 2019, to explore their views on the program's strengths, its impact on teachers, any barriers they faced in the implementation, and suggestions for sustainability. One of the four academies finished the project, under the Academias Gulbenkian do Conhecimento, at the end of the school year 2018–2019 (June 2019) whereas the other three concluded in the 2020–2021 school year.

Level 2 academies

A group of 20 teachers and other school-based professionals from four academies (one is also a level 1 academy) participated in the teacher training led by two group-leaders from the university team. The training was implemented in seven full-day (6 h) workshops, occurring monthly during the school year. All the sessions took place on Saturdays at the university facilities. In order to encourage participation all the teachers were given professional credits, and lunch and coffee-breaks were offered. Between sessions, group-leaders offered individual support to teachers in their classrooms (twice) or online (four times) to support them in implementing the strategies and help them to solve or reflect upon other problems they faced in the implementation. Both group-leaders received close support in training from the UC team mentor in terms of preparing the sessions, solving problems and implementing the training according to the collaborative model. Self and peer evaluations

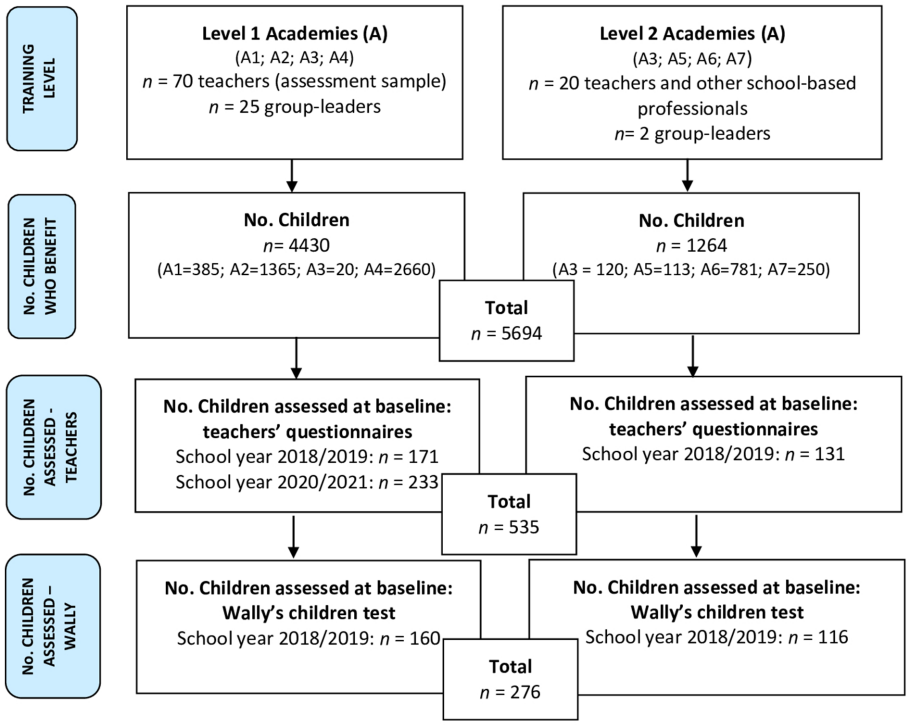


FIGURE 1
Flow chart of number of children who benefit from de intervention and who participate in the outcomes assessment according to the seven (A1 to A7) academies training level.

along with the participant's evaluations of each session were completed and used to support the supervision. At the end of implementation, all the participants were invited for a focus group held at the UC in October 2019, with different goals from those emphasized with level 1 academies: to explore the acceptability of the program and their views about which elements offered barriers to or facilitated implementation in schools. The level 2 academies only took place in the first year of the Academias Gulbenkian do Conhecimento (2018–2019).

Online implementation

Because of the COVID-19 pandemic, the level 1 academies did not have the chance to implement the IY-TCM program during the 2019–2020 school year. However, following the guidelines developed by the program author regarding online implementation of the IY-TCM, they supported the teachers with whom they worked to use the contents and processes of the program during their online contacts with children and parents. After the COVID-19 pandemic, two of the academies started to deliver the program online, with one delivering a group in a mixed format as they had begun in person but later, because of the pandemic-related restrictions, were forced to continue online.

To support all group-leaders with online delivery of the program (including the ones who had finished the contract with the FCG at the end of the first year) the mentor from the UC team ran a 2 h online webinar in January 2021 to share recommendations and strategies developed by the program developer (see https://incredibleyears.com/resources/gl/resources-for-group-leaders-working-remotely/ for more details about IY-TCM online implementation).

Intervention assessment

Procedures

A total of 5,694 children were offered the IY-TCM program (cf. Figure 1, step 2). However, to examine the effectiveness of the program, two teachers were randomly selected from each of the groups in level 1, and all the teachers in level 2 participated (cf. Figure 1, step 1). Regarding the selection of the children for inclusion in the assessment, the method used was inspired in the procedures used by Leckey et al. (2016): each previously recruited teacher selected a total of six children from their classroom based on their evaluation of difficult behaviour. Two children considered to be "easy," two considered to be "average" and two considered to be "difficult." Therefore, although a total of 5,694 children benefited from the program, only a subsample of 9.4% were used for the purpose of assessing the effectiveness of the program presented here (cf. Figure 1, step 2 to step 3).

A written consent was signed by all participant teachers/professionals and parents. On a day previously agreed upon with the teachers/professionals involved in the assessment, two psychologists from the UC team with vast experience in the assessment of children went to schools to individually evaluate the six previously selected children (cf. Figure 1, step 4) and to ask teachers to answer the questionnaires concerning each one. Baseline assessment occurred at the beginning of school year immediately before the intervention started. Post intervention assessment was conducted in the end of the intervention, approximately 7 months after baseline.

10.3389/fpsyg.2023.1198074

TABLE 1 Children's and educational professionals' characteristics at baseline.

Children			Professionals		
N=535			*N* =90		
Age (years)	Min. = 2 Max. = 10	*M* = 5.66 *SD* = 1.90	Professionals' education (*n*, %)		
				Teachers	78 (87%)
Level of schooling (*n*, %)	Preschool	321 (60)		Non-teachers	12 (13%)
	Primary school (1st to 4th year)	214 (40)	Teachers' professional experience (years) (*n* = 78)	Min. = 4 Max. = 40	*M* = 23.36 SD = 8.86
Behavior (*n* = 529) (*n*, %)					
	Easy/average	355 (67.1)			
	Difficult	174 (32.9)			
Mother's level of education (*n* = 408) (*n*, %)			Classrooms		
			N =90		
	Basic (<=9 years)	107 (26.2)	Number of children in the classroom	Min. = 10 Max. = 26	*M* = 19.86 SD = 3.87
	Secondary (12 years)	124 (30.4)	Number of boys in the classroom	Min. = 5 Max. = 16	*M* = 10.29 SD = 2.59
	University degree	177 (43.4)	Number of girls in the classroom	Min. = 2 Max. = 16	*M* = 9.41 SD = 3.18
Father's level of education (*n* = 375) (*n*, %)					
	Basic (<=9 years)	136 (36.3)			
	Secondary (12 years)	138 (36.8)			
	University degree	101 (26.9)			

Participants

Academies

The seven academies participated in the effectiveness assessment (cf. Figure 1).

Four are level 1 academies. A1 is a non-profit community agency with extensive experience in community work, including work with schools in the Lisbon area. A2 is a Department of Child and Adolescent Psychiatry, from a major hospital in the north of the country, strongly committed to mental-health prevention and with large experience in offering IY-Basic parent groups and with partnerships with teams from public health, local schools and the municipality. The group leaders were from different disciplines: psychology, health, social education, primary school and preschool education. A3 is a non-profit private preschool center in the south of the country that wants to bring the IY philosophy to all school staff, professionals and non-professionals. The director and another preschool teacher attended the group-leaders training (level 1) and four other preschool teachers participated in the level 2 training. A4 is a health department of a polytechnic university in the center area of the country. The group-leaders came from different disciplines: health, social education, psychology, and preschool education.

Three others are level 2 academies. A5 is a cluster of schools in the center of Portugal, which had six preschool and primary school teachers participating in the IY-TCM workshop. A6 is a local government service in the Lisbon area, which implemented the IY-TCM in preschool classrooms. As for their professional background, they were psychologists, educational specialists and one was a teacher. A7 is a non-profit organization in the Lisbon area and as A6 implemented the IY-TCM with children in preschool classrooms, their professionals were not teachers but had professional training in social, cultural and educational disciplines.

Teachers and other school-based professionals

Ninety professionals from 7 academies (cf. Figure 1, step 1) participated in the evaluation.

Table 1 presents some of their characteristics. Most of them were teachers (78%). Concerning the non-teaching professionals, seven were school or clinical psychologists and the others were from areas of education. All the professionals, including preschool and primary teachers, had at least a bachelor's degree. They had worked as teachers for an average of 23.36 years (SD = 8.86).

Children

In each classroom, six children were selected to participate in the effectiveness study: teachers identified two children they considered to be "easy," two "average" and two "difficult." In this way 535 children aged 2 to 10 years ($M = 5.66$ years; SD = 1.90) participated in the intervention assessment. Table 1 presents the main sociodemographic characteristics of the sample. More children (60%) are in preschool classrooms compared to the ones in primary school (40%), with this last level corresponding to the first 4 years of compulsory education that in Portugal starts when children are 6 years old. Thirty-three percent were considered to be "difficult" by their teachers. Forty-three percent had mothers with a university degree and 26% had mothers with 9 or less years of education (basic education). The father's education level was found to be lower than the mother's.

Measures

Teacher and other school-based professionals and classroom characteristics

A questionnaire was developed to collect data on the IY-TCM program participants (e.g., professional education, years of experience as teachers), as well as on the classroom characteristics (e.g., number of children, number of boys and girls). It also included some questions aimed at characterizing the six children in each classroom selected for the effectiveness study (e.g., age, mother's and father's level of education).

Children outcomes

Behavior problems

The Strengths and Difficulties Questionnaire (SDQ; Goodman, 1997; Portuguese version by Fleitlich et al., 2005) was used to evaluate children's behavior problems. The SDQ is a 25-item inventory with different versions depending on the child's age range (2 to 4 years-old and 4 to 17 years-old), and on whether the respondent is a parent, teacher or oneself (the latter only for children from 11 to 17). The questionnaire consists of five subscales including five items each: hyperactivity/inattention, emotional problems, conduct problems, peer problems, and prosocial behaviors. Each item is answered on a three point scale: "not true," "somewhat true," or "certainly true," with a minimum score of 0, and a maximum of 10 for each subscale, from which different risk levels are defined. Scores on the first four subscales can be aggregated into a composite of total difficulties (with a minimum score of 0, and a maximum of 40), which is used in this study as an outcome measure. In the present study, the version intended for 4–17 years-old was completed by teachers, who provided answers reporting on the child's behavior over the previous 6 months, as per the instructions. The internal consistency for the composite of total difficulties was 0.80 at baseline and 0.81 at post-intervention.

Social and emotional skills

Two questionnaires, answered by the children's teachers, were used to evaluate the social skills of children, according to their school level, both authored by Merrell: The Social Skills Scale of the Preschool and Kindergarten Behavior Scales—Second Edition (PKBS-2; Merrell, 2002a; Major, 2011; Major and Seabra-Santos, 2014), and the Social Competence Scale of the School Social Behavior Scales—Second Edition (SSBS-2; Merrell, 2002b; Raimundo et al., 2012). For the present study, in order to achieve a common measure for both preschoolers and school aged children, the two scales were compared and the common items were retained for analysis: 6 items deal with Self-Management/Compliance (e.g., "Follows school and classroom rules") and 4 items are related to Peer Relations/Empathy (e.g., "Offers help to other children when they need it"). Good internal consistency levels were obtained for both set of items: 0.91 and 0.87 for Self-Management/Compliance, and 0.87 and 0.88 for Peer Relations/Empathy, at baseline and at post-intervention, respectively.

Problem solving

The Wally Problem Solving test (Webster-Stratton, 1990) was administered to evaluate the children's capacity to find solutions to challenging social situations. The original test presented 12 colored pictures showing social problem scenes that can typically arise in interactions with preschool or early elementary school peers or teachers, or at home with parents. The test version used in this study is a shorter form with six vignettes (Webster-Stratton et al., 2001), including two social challenges, two scenarios with a desired object, and two scenarios of potential punishment. The test was administered in a one-on-one interview format, during which children were shown each of the six images, with the main character matched to their gender and the situation described verbally. Children were then asked what they would do if they faced the social problem depicted and were encouraged to give additional solutions, limited to a total of six responses or until they stopped adding different content. The responses were coded according to the following three indexes, calculated across the six vignettes: (i) proportion of positive solutions, as an indicator of prosocial and self-regulated ways of solving problems; (ii) proportion of aggressive solutions, representing difficulties in the social relationships and self-regulation; and (iii) persistence of positive solutions, indicating the child's capacity to persist in prosocial and positive solutions, before an aggressive solution is given as a response to the problem.

Data analysis

Statistical analyses were performed using SPSS 27.0. Descriptive analyses were conducted to determine the demographic characteristics of the sample. Missing data was low level (<10%) and at random, so missing values were replaced by the mean of the subscale.

The effects of the intervention were analyzed using *t*-test statistics for paired samples comparing score at baseline and scores after the intervention. Considering that multiple comparisons were performed, we used the Bonferroni correction for multiple comparison. The level of significance considered was 0.008 (0.05/6). Cohen's *d* for estimating the effect sizes was calculated using the Lenhard and Lenhard (2016) calculator. Cohen's *d* effect sizes were interpreted considering a value of 0.2 for a small effect size, a value of 0.5 for a medium effect size and a value of 0.8 for a large effect size. *A priori* sample size calculations (Faul et al., 2007) revealed that for a power of 0.90, with significance level of 0.05, testing for differences between two means using *t*-tests, a minimum of 216 participants in the total sample was required for detecting small effects ($d = 0.02$).

Moderation analyses were conducted using the MEMORE (Montoya, 2019) macro for mediation and moderation analysis (model 2), which is a tool available for SPSS to estimate and probe interactions when the focal predictor is a within-participant factor. Examined moderators included variables related to the child, the level of teachers' training in the IY-TCM, and the professional background of the teachers and other school-based professionals who implemented the IY-TCM in the classrooms. Regarding the moderation effects, GPower was also used for calculating sample sizes: for a power of 0.90, with significance level of 0.05, testing for linear multiple regression (fixed model, r^2 increase), a minimum of 353 participants in the total sample was required for detecting small effects ($f^2 = 0.03$).

Results

Intervention effects

Table 2 presents the means, standard deviations (SD) and the significance tests of the comparison between the baseline and the post intervention scores for all the study variables.

TABLE 2 Descriptives and pre to post intervention comparison of the outcome variables.

Outcomes	*N*	Baseline (mean±SD)	Post intervention (mean±SD)	*t*-test	*p*	Cohen *d*
Children's social and emotional skills						
Self-Management/compliance	505	20.35 ± 3.69	21.45 ± 3.08	−10.81	<0.001	0.32
Peer-relations/empathy	508	13.49 ± 2.58	14.30 ± 2.16	−10.84	<0.001	0.33
Behavior problems						
SDQ total difficulties score	517	11.62 ± 6.47	10.45 ± 6.30	7.124	<0.001	0.18
Social problem-solving strategies						
Proportion of positive solutions	276	85.08 ± 17.88	88.81 ± 13.32	−3.76	<0.001	0.25
Proportion of aggressive solutions	276	3.59 ± 7.40	2.25 ± 5.67	−2.91	0.004	0.20
Persistence of positive solutions	276	81.62 ± 19.89	85.17 ± 14.42	−2.95	0.003	0.19

As presented in the table, significant changes were observed in all variables that were assessed. Children assessed before and after the intervention significantly increased their social and emotional skills, namely self-management/compliance and peer-relations/ empathy, and the effect sizes of these changes were small. Similarly, regarding social problem-solving strategies, there were significant increases from the baseline to the post intervention, also of small effect sizes. Finally, results also showed that children significantly decreased their scores in terms of behavior problems, although in the case the effect size was the smaller found (Cohen $d = 0.18$).

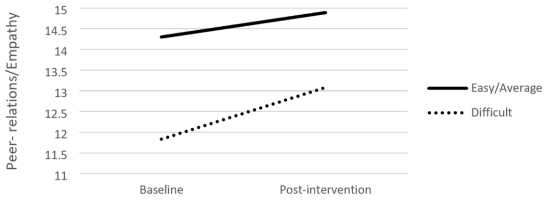


FIGURE 2
Moderation effect of children's behaviour and peer-relations/ empathy.

Moderation effects of the intervention

Moderation effects were examined for all the outcome variables: children's social and emotional skills (self-management/compliance; peer-relations/empathy), behavior problems (SDQ total difficulties score) and social problem-solving strategies (proportion of positive solutions, persistence of positive solutions, and proportion of aggressive solutions). Moderators that were tested were related to the:

(1) children's characteristics (children's behavior assessed by their teacher: 0 = easy/average, 1 = difficult; children's level of schooling: 0 = preschool, 1 = primary school); (2) mother's education (mothers' level of education: 1 = basic, 2 = secondary, 3 = university); and (3) IY-TCM training and delivery-related variables (IY-TCM training level: 0 = at university level and 1 = at local community level) and intervention professionals (0 = teachers, 1 = not teachers).

Non-significant moderation effects are not presented. Significant moderation effects were found for *children's social and emotional skills* considering children's behavior (for self-management/compliance and peer-relations/empathy), mothers level of education (for self-management/compliance) and level of children's schooling (for peer-relations/empathy).

Children characteristics

The evaluation of children as "easy/average" or "difficult" by their teachers was a significant moderator of the change of self-management/compliance and peer-relations/empathy skills. Indeed, regarding changes in peer-relations/empathy due to the intervention,

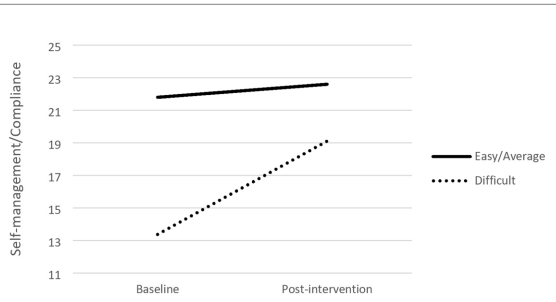


FIGURE 3
Moderation effects of children's behaivour and self-management/ compliance.

results showed that children's difficulty ($b = -0.33$) was significantly associated with changes in peer-relations/empathy scores ($R^2 = 03$, $F(1,506) = 18.02$, $p < 0.001$). Conditional effects showed that effects were different between children assessed as "easy/average" ($b = -0.59$, $p < 0.001$) and those identified as "difficult" ($b = -1.25$, $p < 0.001$), with the latter group showing higher changes (cf. Figure 2). A similar effect was found regarding self-management/compliance. Results showed that the evaluation of children as "easy/average" or "difficult" by their teachers ($b = -0.47$) was significantly associated with changes in self-management/compliance scores ($R^2 = 0.19$, $F(1,503) = 19.39$, $p < 0.001$). Conditional effects showed that effects were different between children evaluated as "easy/average" ($b = -0.79$, $p < 0.001$) and as "difficult" ($b = -1.73$, $p < 0.001$), with, again, the latter group showing higher changes (cf. Figure 3).

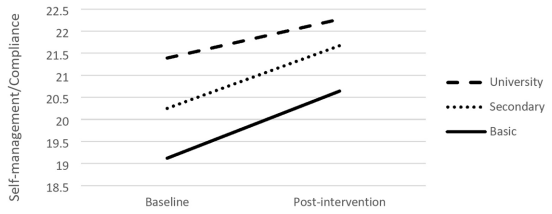


FIGURE 4
Moderation effects of mother's level of education and self-management/compliance.

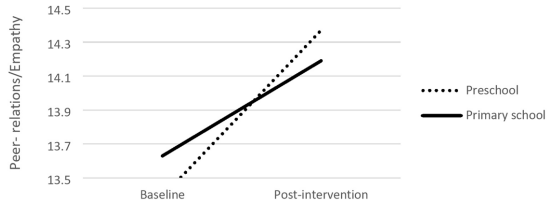


FIGURE 5
Moderation effects of children's school level and peer-relation/empathy.

Mother's level of education

Mother's level of education ($b = 0.34$) was also a significant moderator of changes in children's self-management/compliance behavior ($R^2 = 12$, $F(1,391) = 5.45$, $p = 0.02$). Conditional effects showed different slopes between mothers with basic ($b = -1.49$, $p < 0.001$), secondary ($b = -1.21$, $p < 0.001$) and higher ($b = -0.93$, $p < 0.001$) education, with the first two groups showing higher changes (cf. Figure 4).

Children's level of schooling

Finally, children's level of schooling ($b = 0.41$) was also a significant moderator of changes in children's peer-relations/empathy behavior ($R^2 = 12$, $F(1,506) = 5.45$, $p = 0.01$). Conditional effects showed different slopes between preschool children ($b = -0.98$, $p < 0.001$) and primary school children ($b = -0.56$, $p < 0.001$), with the former showing higher change in peer-relations/empathy behavior (cf. Figure 5).

Discussion

The Academias Gulbenkian do Conhecimento initiative provided a unique opportunity to understand the impact of the IY-TCM program on children's social and emotional competence and skills when delivered on a large scale as an universal classroom-based intervention in the real world, and to understand how some variables (related with the children, the school-based professionals who deliver the program, and the type of group-leaders training) moderate that impact.

All the impact results found represent improvements in the desired directions, however with small effect sizes, and they confirm results of previous efficacy studies (RCT or quasi-experimental designs) where the IY-TCM was implemented as a stand-alone intervention, in other countries including in Portugal.

The significant increase in social skills as reported by teachers, in both dimensions assessed (one more related with self-regulation and compliance and the other with peer-relationships and empathy), is in line with the results found in other studies, as in the one conducted by Baker-Henningham et al. (2018) in a low-income country, Jamaica, with a sample of preschool children considered by their teachers as having the highest level of conduct problems in the classroom. However, unlike our study, the effect sizes found were high, perhaps because it was a high-risk sample with more space for improvement. Also relevant is the case from Norway, Fossum et al. (2017), which examined a universal sample of kindergartens from 3 to 6 years-old children, including a sub-sample of children who scored at or above the 90th percentile on aggressive behavior at baseline, and also found significant improvements in social skills based on teachers' reports. However, small effect sizes were reported for the universal sample, as in our study, and higher for the behavior risk sub-sample. In Portugal, Vale (2012), in a universal sample of preschool children, and Seabra-Santos et al. (2018) with a sample of preschoolers from low-income areas, found the same type of improvement. The effect sizes reported in the Seabra-Santos et al. study (Seabra-Santos et al., 2018) are also small, yet they indicated that the children who benefited more from the intervention, in terms of social skills, are those with lower social skills at baseline and coming from families in economic need. In the recent meta-analysis conducted by Korest and Carlson (2022), where most of the previous studies we have just described were also included, as well as others conducted in other countries (United Kingdom, Ireland, New-Zealand and the United States), the efficacy of the IY-TCM is confirmed as a stand-alone program concerning the increase of prosocial behavior for teacher-rated reports, although with small effects sizes.

Problem behaviors were also assessed in our study using teacher-reports, and as for social skills, significant improvements were found with a reduction after the intervention.

In Baker-Henningham et al. (2018), significant reductions in teacher-reported behavior difficulties were also found and with medium effect sizes. The same reduction was observed in the Seabra-Santos et al. (2018) study, however without the differential impact found for social skills as described above. Fossum et al. (2017) also reveals a positive impact in the teacher-reported behavior difficulties in the universal sample, but for the high-risk group of children none of the reduction was significant at the 0.05 level. In a mixed methods systematic review, Nye et al. (2019) reported a small, statistically significant effect (using observation and teachers-report measures) of the IY-TCM on reducing child conduct problems, but only for high-risk conduct children. In the recent meta-analysis from Korest and Carlson (2022), small positive effects were found on children's externalizing behaviors, with larger effect sizes for higher risk children (i.e., children with behavior problems above the clinical range as defined by the study).

One of the goals of the FCG academies is to improve *problem solving* defined as the way the child "realistically assesses problems, looks for alternatives, decides and implements solutions using creativity and logical thinking, keeping in mind the consequences on self and others" (see footnote 2). In our study the impact of the IY-TCM on children's social problem-solving skills was assessed with a task administered via a one-on-one interview format. Our results provide consistent evidence of the positive impact of the IY-TCM program on the three indicators assessed, as statistically significant

effects were found for the three changes analyzed. The three effect sizes were small, ranging from 0.19 to 0.25, however the highest effect size was obtained for the proportion of positive solutions compared with the other two. The assessment of the IY programs' impact in social problem-solving skills is more usual when the IY programs for children are implemented versus when the programs used are directed at parents and teachers, which is one of the reasons why this outcome is not reported in the IY-TCM meta-analysis conducted by Korest and Carlson (2022). For instance, Williams et al. (2019) developed a RCT in primary schools where the universal IY Classroom Dinosaur School program was delivered by teachers to at risk children and where teachers were already trained in the IY-TCM. According to the results, improvements in the problem-solving knowledge of children, as evaluated by the Wally Problem Solving measure, were found in the intervention condition, compared to children in the control condition, with medium effect sizes for prosocial (ES = 0.39) and for agonistic (ES = 0.41) solutions.

Therefore, our results provide broad support as to the effectiveness of the IY-TCM, when implemented as a universal school-based program, on a large-scale and in the real world, as they yield significant improvements across the different variables assessed, that is, those related with children's social and emotional competence, including social problem-skills. These results are in line with the seven socio-emotional competencies the Academias Gulbenkian do Conhecimento initiative sought to improve in children. However, to effectively reduce the gap between research and practice in education it is not enough to simply assess the impact of the intervention in the real world. According to Shonkoff (2017), we need to know not only whether the interventions achieve the intended effects, but also in what contexts, for whom and how. In order to answer the last two questions, moderation effects were examined for all the outcome variables.

Non-significant moderation effects were found when considering the level of IY-TCM training and the professional background of the professionals who delivered the intervention as moderators, meaning that the intervention was effective regardless the conditions. Concerning the IY-TCM training, the sessions at the university level involved experienced group-leaders from whom we could expect more adherence to the intervention's components. Also, both are trained as psychologists and their clinical training could contribute to the development of skills central to the collaborative process and in the development of therapeutic alliance, which research about the role of the group-leaders of the IY Basic program for parents in Portugal highlights as central in the process of change (Leitão et al., 2022). Likewise, in Ireland the IY-TCM training to primary school teachers is offered by educational psychologists from the National Educational Psychology Service, as part of their continuing professional development (Davey and Egan, 2021). However, in a qualitative study about the teachers' views on the acceptability and implementation of the IY-TCM in UK primary schools, the professional qualification of group-leaders (e.g., psychologist) was not indicated as important (Allen et al., 2022). Rather, they value group-leaders who are welcoming, supportive, open, friendly, non-judgmental or patronizing, who recognize them as experienced teachers, encourage them actively to value and support each other (Allen et al., 2022). The model of training and close supervision offered by the university team to local community group-leaders thus gave them the opportunity to develop those competences central in the collaborative process. The in-built fidelity tools of the IY-TCM program and all the materials (manuals, DVDs, books, and other items) provided to local group-leaders also served to increase the fidelity of implementation (Hutchings and Williams, 2017). Additionally, local group leaders had the opportunity to establish partnerships with local schools, school leaders and teachers and adequate the implementation to the needs of the participants in a more significant way. Furthermore, because they work at the local level, they can support teachers in a more personalized and intensive way and not be dependent on external support. Also, the teachers in the group can work with local peers and construct a stronger and sustainable community of support, considered by teachers themselves as one of the most important aspects of IY-TCM (Allen et al., 2022). Therefore, both training conditions had strengths that could explain why both are equally effective in our study.

Considering the professionals who implemented the intervention in classrooms, the non-significant moderation effects found indicate that the intervention was equally effective when delivered by teachers or by other professionals who work with children in the classroom. Durlak et al. (2022), in their review of 12 meta-analyses of universal, school-based social and emotional learning (SEL) programs, from pre-school to high-school, reported mixed results related with the type of professional who delivered the intervention, when they compared teachers with researchers. In our study all non-teacher professionals were like their teaching counterparts in that they also held a university degree and were experienced in working with children in a regular basis in their classrooms via planned activities with a focus in the socio-emotional development. They all attended the training at the university level by two experienced and qualified group-leaders. Our findings support the author's assumption that the IY-TCM program can be implemented not only by teachers but also by other professionals working in educational environments (Webster-Stratton, 2011a).

When we move our focus to the variables of the children and the mother (initial behavior as reported by their teachers, children's level of schooling, and mother's level of education) the moderation results are mixed with respect to the outcome variable analyzed. According to our results, no significant moderation effects were found for teacher-reported behavior difficulties (measured with the SDQ), nor for social problem-solving strategies used by children (measured by the Wally test). In fact, when considering these outcome variables, we observed that all the children benefit similarly from the IY-TCM program.

However, significant moderation effects were found for the social skills as reported by teachers considering children's initial behavior, children's level of schooling and mother's level of education. When initial behavior was taken as the moderator, significant effects were found both for self-regulation/compliance and for peer-relations/empathy, with children assessed as difficult showing more benefits from the intervention when compared to the ones assessed as easy/average. These results replicate the ones of previous research with Portuguese disadvantaged preschoolers (Seabra-Santos et al., 2018), which pointed out that the initial behavior risk was a moderator of the IY-TCM impact, with children at higher risk at baseline benefitting more from the intervention. As in the present study, the moderation effect found was only significant for social skills but not for behavior problems. Both results are in line with the Korest and Carlson (2022) meta-analysis: initial severity of child behavior is a moderator of program effects;

and the effect sizes are higher for prosocial outcomes compared to externalizing behavior problems. One explanation for the higher impact on the prosocial behavior result could be the strong emphasis the program places on positive behavior. Thus, the theoretical foundation of the IY-TCM, expressed in a "teaching pyramid," is that the teacher focuses first on increasing positive behavior rather than on reducing negative behavior (Webster-Stratton, 2012). As for the moderation effect of the severity of the initial child behavior, a possible explanation may have to do with a central tool of the program: the "individualized behavior plans" (Webster-Stratton, 2011b). Those plans are developed and applied by teachers with those children who pose the most behavioral challenges in classroom and the same intervention logic mentioned before is followed: start by increasing positive behaviors and only then, and if necessary, resort to strategies to reduce negative behaviors. As so, the development of a behavior plan for a difficult child in their classrooms is part of the teacher's tasks during the training delivered in our study, and in supervision those plans are discussed and developed to respond to the child's needs in a more effective way. Also, in our study teachers chose one of the two children they had indicated as difficult (two of the six children who were evaluated in the class) to be the target of their plan and this could be another reason that contributed to the results we found: the children who benefit more are the ones the teachers initially selected as difficult.

Other significant moderation effect found indicates that children from preschools took more from the intervention when compared to primary school children in terms of peer-relationships and empathy. We may be facing an age effect, and if so, our results are in line with the results found in five meta-analysis of SEL interventions reviewed by Durlak et al. (2022): younger children benefited more than older ones. However in the other six meta-analyses the authors reviewed, age was not found to be a significant moderator. Qualitative studies with the IY-TCM reported that some teachers felt the program was more suitable for younger children (4–6 years old as compared to 7–11 years old), and that some contents (e.g., the use of social coaching and descriptive comments) did not work well with older children (Allen et al., 2022). Concerning the Portuguese context, we may also hypothesize that primary school teachers, when compared to their preschool counterparts, lack the time, and at times the motivation, to implement the IY-TCM strategies, more directly focused on social and emotional development, in their classrooms, because their focus is more on cognitive learning. Therefore, conflict with the curricular goals is stronger in the primary school context compared to preschool context, where teachers have more autonomy to manage and choose the activities to develop in their classrooms, as they only have to follow curricular guidelines, and the emphasis on socio-emotional skills is stronger than in primary schools.

Finally, a significant moderation effect identified is directly related with self-regulation and compliance: children with mothers with basic or secondary education experience greater changes in self-regulation and compliance (but not in peer-relations/empathy) compared with children whose mothers have a university degree. This result is also in line with Seabra-Santos et al. study (Seabra-Santos et al., 2018), who reported that children who gained more from the intervention, with respect to social skills, were those coming from families in economic need. Low income and low level of education are both markers of low socioeconomic status (SES) (Berry et al., 2022).

Strengths and limitations

Our results provide promising evidence that the IY-TCM—implemented as an universal school-based program in the real world, delivered by teachers or other school-based professionals, trained by existing staff in community services or by researchers from a university, with close supervision and support by a qualified and experienced team in the IY programs – yields significant improvements in different variables related with children's socio-emotional and behavioral competence, benefiting those who exhibit more need: children with more difficult behavior and children whose mothers are less educated. These differential results thus contradict the Matthew effect, a hypothesis proposed to explain differential effects of interventions, which suggests that children who start with less disadvantage and higher skills are those who will benefit more because they are better equipped to take advantage of the learning opportunities and have more capacity to build on their initial skills. On the contrary, our results reinforce the compensatory hypothesis based on the higher risk and greater room for improvement that some children demonstrate (McClelland et al., 2017).

However, we must keep in mind that certain limitations exist in our study. An initial and broader limitation has to do with the absence of a systematic assessment and/or analysis of the implementation effectiveness. Considering the "Implementation Outcomes Taxonomy" (Proctor et al., 2011), acceptability, adoption, appropriateness and feasibility were assessed at program participants' level and considering teachers and group-leaders' perceptions expressed in the IY-questionnaires. Focus groups were conducted with teachers and group-leaders at the end of the first year of the academies. However, that data haven't been analyzed so far. Future studies also need to assess and control systemic variables that could impact not just the success of the intervention but also the success of the implementation (Allen et al., 2022) at diverse levels, such as the individual (e.g., personal and professional competencies of group-leaders and teachers), the contextual (e.g., internal and external support, learning climate, staff, leadership) and the social (e.g., popularity of school-based SEL programs, educational policy) (Hagermoser Sanetti and Collier-Meek, 2019; Durlak et al., 2022).

Another limitation is the absence of a control group specifically for the implementation in primary schools, where the IY-TCM effectiveness has not yet been demonstrated in the Portuguese context. An RCT with primary school teachers, accompanied by a qualitative study, could help to understand why primary school teachers benefited less from program participation, compared to preschool educators, as shown in our study.

As for the measure used to assess social and emotional skills in order to achieve a common measure for both preschoolers and school aged children, 10 items were retained from two different questionnaires, one to be answered by primary school teachers and other by their preschool counterparts. The author is the same for both measures and good internal consistency levels were obtained for both set of items: Self-Management/Compliance, and Peer Relations/Empathy, at baseline and at post-intervention. However, more psychometric studies need to be developed with this new adaption, which has the strength of being usable to evaluate children at both levels of schooling.

Regarding the measures used, it is important to note that the Wally Problem Solving test was applied here in Portugal for the first time; it was included in the protocol for evaluating the implementation of IY-TCM as well for the first time. However, because of the absence

of previous studies in Portugal, more studies are needed. Also, the degree of difficulty in the child's behavior at baseline was established based on their teachers' reports and not on a standardized measure, which can also be seen as a limitation of this study.

Finally, considering that the intervention was implemented in several schools, there may be some variability across schools that was not accounted for. Indeed, it might well be noted that certain results are attributable to the characteristics of the school itself, thus representing a source of bias and one which our statistical analysis did not take into account.

Conclusion

The implementation model described in this paper meets the needs of the FCG via the Academias Gulbenkian do Conhecimento project. We demonstrated how a team of researchers linked to a university and with extensive experience in research and dissemination of EBP was able to develop and implement a model that not only contributed to reducing the gap between research and practice, but also proved to be able to promote changes in social and emotional competencies related to the mission of the academies. The existence of a "university champion" that shows leadership and had access to the decision makers (the funder) is considered by some authors as a critical element contributing to successful implementation (Hutchings and Williams, 2017). The "local champions" who led level 1 academies, and which worked closely with the coordination team from the university, enhanced the conditions for successful implementation and reinforced the guarantee of sustainability. The proportionate fidelity of the implementation, ensuring that all academies used the same high dosage (42 h) but with different application formats (monthly, fortnightly) and modalities (face-to-face, online or mixed) may have been one of the factors that contributed to its acceptability, adoption and appropriateness (Proctor et al., 2011). At the same time, this also shows how it is possible to make small adaptations to programs transported from other countries without distorting them yet still maintaining their effectiveness (Nye et al., 2019).

Findings from our study support expanding the IY-TCM model of implementation and training adopted, along with research that could respond to the limitations of our study. Pilot cost-effectiveness studies also need to be done in order to test the feasibility of including this model in Portugal's national system of continuing professional development for teachers. This is an important step on the path to achieving desirable educational and social equity and to maintaining the schools' and the teachers' central position in the promotion of not only the emotional and social development of children but also their mental health and well-being, qualities which are essential in society's efforts to achieve some of the 17 United Nations Sustainable Development Goals (SDGs) (e.g., SDG 1—No Poverty; SDG 3—Good Health and Well-Being; SDG 4—Quality Education; SDG 10—Reduce Inequalities).

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Ethics statement

Ethical review and approval was not required for the study on human participants in accordance with the local legislation and institutional requirements. Written informed consent to participate in this study was provided by the participants' legal guardian/next of kin.

Author contributions

MG: conceptualization, implementation coordinator, group-leaders training, teachers training, supervision, methodology, writing—original draft, and writing—review. MS-S: conceptualization, assessment coordinator, methodology, writing—original draft, and writing—review. JR: assessment, data collection, and writing—review. MP: teachers training and supervision, assessment, data collection, and writing—review. TH: teachers training and supervision and writing—review. AA: group-leaders training and supervision and writing—review. MM-R: statistical analysis, writing—original draft, and writing—review. All authors contributed to the article and approved the submitted version.

Funding

The financing for this research was generously awarded by the Fundação Calouste Gulbenkian under the Academias Gulbenkian do Conhecimento initiative and through a collaboration protocol established with the Faculdade de Psicologia e de Ciências da Educação, Universidade de Coimbra in Portugal (PS0701 and PS0796). The open access publication fees were also sponsored by the same entity. This funding entity played no role in data collection, data analysis, interpretation of data and writing the paper. The views and opinions expressed therein are those of the authors.

Acknowledgments

The authors would like to express their gratitude to all IY-TCM Academies coordinators and members, to all teachers and other school-based professionals involved in IY-TCM implementation, to all children who participated in the impact assessment trial and their parents. To the Fundação Calouste Gulbenkian team, we greatly appreciate their support in implementation, monitoring and impact assessment. Finally, we also thank Scott M. Culp for kindly providing language assistance in the revision of this manuscript.

Conflict of interest

The Incredible Years is a trademark owned by The Incredible Years, Inc. MG may receive occasional payments for training leaders in the Incredible Years TCM program. MG, MS-S, TH and AA also receive occasional payments for training group-leaders in the Incredible Years parent program.

The remaining authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Publisher's note

References

Allen, K., Hansford, L., Hayes, R., Longdon, B., Allwood, M., Price, A., et al. (2022). Teachers' views on the acceptability and implementation of the Incredible Years® Teacher Classroom Management programme in English (UK) primary schools from the STARS trial. *Br. J. Educ. Psychol.* 92, 1160–1177. doi: 10.1111/bjep.12493

Baker-Henningham, H., Scott, S., Jones, K., and Walker, S. (2018). Reducing child conduct problems and promoting social skills in a middle-income country: cluster randomised controlled trial. *Br. J. Psychiatry* 201, 101–108. doi: 10.1192/bjp.bp.111.096834

Barry, M. (2019a). "Implementation processes and strategies for mental health promotion" in *Implementing mental health promotion*. eds. A. M. Clarke, L. Rowling, R. Jenkins and A. Khan. *2nd* ed (Springer), 101–129.

Barry, M. (2019b). "Reframing the challenge of promoting population mental health" in *Implementing mental health promotion*. eds. A. M. Clarke, L. Rowling, R. Jenkins and A. Khan. *2nd* ed (Springer), 35–57.

Berry, V., Melendez-Torres, G. J., Axford, N., Axberg, U., de Castro, B. O., Gardner, F., et al. (2022). Does social and economic disadvantage predict lower engagement with parenting interventions? An integrative analysis using individual participant data. *Prev. Sci.*, 1–12. doi: 10.1007/s11121-022-01404-1

Carlson, J. S., Tiret, H. B., Bender, S. L., and Benson, L. (2011). The influence of group training in the Incredible Years Teacher Classroom Management Program on preschool teachers' classroom management strategies. *J. Appl. Sch. Psychol.* 27, 134–154. doi: 10.1080/15377903.2011.565277

Clarke, A. M. (2019). "Promoting children's and young people's mental health in schools" in *Implementing mental health promotion*. eds. A. M. Clarke, L. Rowling, R. Jenkins and A. Khan. *2nd* ed (Springer), 303–339.

Davey, N., and Egan, M. (2021). Sustained CPD as an effective approach in the delivery of the Incredible Years Teacher Classroom Management Programme. *Educ. Psychol. Pract.* 37, 169–186. doi: 10.1080/02667363.2021.1886910

Durlak, J. A., Mahoney, J. L., and Boyle, A. E. (2022). What we know, and what we need to find out about universal, school-based social and emotional learning programs for children and adolescents: a review of meta-analyses and directions for future research. *Psychol. Bull.* 148, 765–782. doi: 10.1037/bul0000383

Faul, F., Erdfelder, E., Lang, A.-G., and Buchner, A. (2007). G*power 3: a flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behav. Res. Methods* 39, 175–191. doi: 10.3758/BF03193146

Fleitlich, B., Loureiro, M., Fonseca, A., and Gaspar, F. (2005). Questionário de Capacidades e Dificuldades (SDQ-Por) (Strengths and difficulties questionnaire, Portuguese version). Available at: https://www.sdqinfo.org/

Fossum, S., Handegård, B. H., and Britt Drugli, M. (2017). The Incredible Years Teacher Classroom Management Programme in kindergartens: effects of a universal preventive effort. *J. Child Fam. Stud.* 26, 2215–2223. doi: 10.1007/s10826-017-0727-3

Gaspar, M., Patras, J., Hutchings, J., Homem, T., Azevedo, A., Pimentel, M., et al. (2022). Effects of a teacher classroom management program on preschool teachers' practices and psychological factors: a randomized trial with teachers of children from economically disadvantaged families. *Early Educ. Dev.* 34, 626–647. doi: 10.1080/10409289.2022.2063612

Goodman, R. (1997). The strengths and difficulties questionnaire: a research note. *J. Child Psychol. Psychiatry Allied Discip.* 38, 581–586. doi: 10.1111/j.1469-7610.1997.tb01545.x

Hagermoser Sanetti, L. M., and Collier-Meek, M. A. (2019). Increasing implementation science literacy to address the research-to-practice gap in school psychology. *J. Sch. Psychol.* 76, 33–47. doi: 10.1016/j.jsp.2019.07.008

Hutchings, J., and Williams, M. (2017). Taking the Incredible Years Child and Teacher Programs to scale in Wales. *Child. Educ.* 93, 20–28. doi: 10.1080/00094056.2017.1275233

Korest, R., and Carlson, J. S. (2022). A meta-analysis of the current state of evidence of the Incredible Years Teacher-Classroom Management Program. *Children* 9:24. doi: 10.3390/children9010024

Leckey, Y., Hyland, L., Hickey, G., Lodge, A., Kelly, P., Bywater, T., et al. (2016). A mixed-methods evaluation of the longer-term implementation and utility of a teacher classroom management training programme in Irish primary schools. *Irish Educ. Stud.* 35, 35–55. doi: 10.1080/03323315.2016.1147974

Leitão, S. M., Pereira, M., Santos, R. V., Gaspar, M. F., and Seabra-Santos, M. J. (2022). Do parents perceive practitioners to have a specific role in change? A longitudinal study following participation in an evidence-based program. *Int. J. Environ. Res. Public Health* 19, 2–18. doi: 10.3390/ijerph19159100

Lenhard, W., and Lenhard, A. (2016). Computation of effect sizes. Available at: https://www.psychometrica.de/effect_size.html

Major, S. (2011). Avaliação de aptidões sociais e problemas de comportamento em idade pré-escolar: Retrato das crianças portuguesas (Assessment of social skills and behavior problems in preschoolers: Portrait of Portuguese children). (Doctoral dissertation, University of Coimbra). Estudo Geral: Repositório Científico da UC. Available at: https://estudogeral.uc.pt/handle/10316/17774

Major, S., and Seabra-Santos, M. J. (2014). Preschool and kindergarten behavior scales—second edition (PKBS-2): Adaptação e estudos psicométricos da versão Portuguesa (Preschool and kindergarten behavior scales—second edition (PKBS-2): adaptation and psychometric studies of the Portuguese version). *Psicol. Reflex. Crít.* 27, 689–699. doi: 10.1590/1678-7153.201427409

McClelland, M., Tominey, S., Schmitt, S., and Duncan, R. (2017). SEL interventions in early childhood. *Futur. Child.* 27, 33–47. doi: 10.1353/foc.2017.0002

Merrell, K. W. (2002a). *Preschool and kindergarten behavior scales—second edition*. (TX: PRO-ED).

Merrell, K. W. (2002b). *School social behavior scales—second edition*. (Assessment-Intervention Resources)

Montoya, A. K. (2019). Moderation analysis in two-instance repeated measures designs: probing methods and multiple moderator models. *Behav. Res. Methods* 51, 61–82. doi: 10.3758/s13428-018-1088-6

Nye, E., Melendez-Torres, G., and Gardner, F. (2019). Mixed methods systematic review on effectiveness and experiences of the Incredible Years Teacher Classroom Management Programme. *Rev. Educ.* 7, 631–669. doi: 10.1002/rev3.3145

Proctor, E., Silmere, H., Raghavan, R., Hovmand, P., Aarons, G., Bunger, A., et al. (2011). Outcomes for implementation research: conceptual distinctions, measurement challenges, and research agenda. *Adm. Policy Ment. Health Ment. Health Serv. Res.* 38, 65–76. doi: 10.1007/s10488-010-0319-7

Raimundo, R., Carapito, E., Pereira, A. I., Pinto, A. M., Lima, M. L., and Ribeiro, M. T. (2012). School social behavior scales: an adaptation study of the Portuguese version of the social competence scale from SSBS-2. *Span. J. Psychol.* 15, 1473–1484. doi: 10.5209/rev_SJOP.2012.v15.n3.39431

Reinke, W. M., Stormont, M., Webster-Stratton, C., Newcomer, L. L., and Herman, K. C. (2012). The Incredible Years Teacher Classroom Management Program: using coaching to support generalization to real-world classroom settings. *Psychol. Sch.* 49, 416–428. doi: 10.1002/pits.21608

Sanders, M. R., Divan, G., Singhal, M., Turner, K., Velleman, R., Michelson, D., et al. (2022). Scaling up parenting interventions is critical for attaining the sustainable development goals. *Child Psychiatry Hum. Dev.* 53, 941–952. doi: 10.1007/s10578-021-01171-0

Sandilos, L., Goble, P., and Schwartz, S. (2020). Burnout and teacher–child interactions: the moderating influence of SEL interventions in head start classrooms. *Early Educ. Dev.* 31, 1169–1185. doi: 10.1080/10409289.2020.1788331

Seabra-Santos, M. J., Gaspar, M. F., Major, S. O., Patras, J., Azevedo, A., Homem, T. C., et al. (2018). Promoting mental health in disadvantaged preschoolers: a cluster randomized controlled trial of teacher training effects. *J. Child Fam. Stud.* 27, 3909–3921. doi: 10.1007/s10826-018-1208-z

Shonkoff, J. P. (2017). Rethinking the definition of evidence-based interventions to promote early childhood development. *Pediatrics* 140:e20173136. doi: 10.1542/peds.2017-3136

Tveit, H., Drugli, M., Fossum, S., Handegård, B., and Stenseng, F. (2020). Does the Incredible Years Teacher Classroom Management Programme improve child-teacher relationships in childcare centres? A 1-year universal intervention in a Norwegian community sample. *Eur. Child Adolesc. Psychiatry* 29, 625–636. doi: 10.1007/s00787-019-01387-5

UNESCO (2021). Reimagining our futures together: a new social contract for education. *Report from the International Commission on the Futures of Education*. Available at: https://unesdoc.unesco.org/ark:/48223/pf0000379707.locale=en

Vale, V. (2012). Tecer Para não ter de remendar: O desenvolvimento socioemocional em idade pré-escolar e o programa Anos Incríveis Para educadores de infância (Weaving to avoid having to mend: Pre-school socio-emotional development and the incredible years program for early childhood educators) (doctoral dissertation, University of

Coimbra). Estudo Geral: Repositório Científico da UC. Available at: http://hdl.handle.net/10316/18273

Webster-Stratton, C. (1990). Long-term follow-up of families with young conduct-problem children: from preschool to grade school. *J. Clin. Child Psychol.* 19, 144–149. doi: 10.1207/s15374424jccp1902_6

Webster-Stratton, C. (2011a). *The incredible years: parents, teachers, and children's training series: program content, methods, research and dissemination 1980–2011* Incredible Years. Available at: https://incredibleyears.com/books/

Webster-Stratton, C. (2011b). *The incredible years teachers and children series. Teacher classroom management program: video based-instructions for teachers, school counselors, and those who work with groups of children (leader's guide)* Incredible Years.

Webster-Stratton, C. (2012). *Incredible teachers: nurturing children's social, emotional, and academic competence*. (Incredible Years, Inc.). Available at: https://incredibleyears.com/books/

Webster-Stratton, C., and Bywater, T. (2015). Incredible partnerships: parents and teachers working together to enhance outcomes for children through a multi-modal evidence based programme. *J. Child. Serv.* 10, 202–217. doi: 10.1108/JCS-02-2015-0010

Webster-Stratton, C., Reid, J., and Hammond, M. (2001). Social skills and problem-solving training for children with early-onset conduct problems: who benefits? *J. Child Psychol. Psychiatry* 42, 943–952. doi: 10.1111/1469-7610.00790

Williams, M., Bywater, T., Lane, E., Williams, N., and Hutchings, J. (2019). Building social and emotional competence in school children: a randomised controlled trial. *Psychology* 10, 107–121. doi: 10.4236/psych.2019.102009

World Health Organization and Calouste Gulbenkian Foundation (2014). Social determinants of mental health. Available at: https://apps.who.int/iris/bitstream/handle/10665/112828/9789241506809_eng.pdf

frontiers | Frontiers in Psychology

TYPE Curriculum, Instruction, and Pedagogy
PUBLISHED 06 September 2024
DOI 10.3389/fpsyg.2023.1197193

OPEN ACCESS

EDITED BY
Pedro Rosário,
University of Minho, Portugal

REVIEWED BY
Irene Cadime,
University of Minho, Portugal
Maura Pilotti,
Prince Mohammad bin Fahd University, Saudi Arabia
Dongmei Meng,
East China Jiaotong University, China

*CORRESPONDENCE
Patrícia Sarmento
✉ semearvalores@gmail.com

RECEIVED 30 March 2023
ACCEPTED 29 May 2023
PUBLISHED 06 September 2024

CITATION
Sarmento P, Lobo M and Kirtikumar K (2024) The impact of adolescents' voice through an online school radio: a socio-emotional learning experimental project.
Front. Psychol. 14:1197193.
doi: 10.3389/fpsyg.2023.1197193

The impact of adolescents' voice through an online school radio: a socio-emotional learning experimental project

Patrícia Sarmento*, Mafalda Lobo and Kalpna Kirtikumar

Semear Valores Cooperative, Cascais, Portugal

Universal school-based socio-emotional learning (SEL) programs for adolescents have shown their efficacy in producing positive outcomes. The aim of the current study is to present an original school-based program and project for adolescents—*Semear Valores On-air* – and to assess the relationship between participation in the project and students' socio-emotional skills. Based on the character strengths and virtues model, this online school radio project aimed at promoting communication, creative thinking, adaptability, and resilience skills in adolescents and giving them the opportunity to become influential agents of well-being and citizenship. As part of the school curriculum, students were invited to create and record radio shows and podcasts. An online school radio was thus created, and it continues to broadcast all over the world, with music, daily shows, and interviews 24/7. It was developed within the framework of the Gulbenkian Academies for Knowledge, a nationwide Portuguese program, that seeks to prepare children and youth for change, to enable them to deal with complex problems, and to expand their opportunities for achievement. A quasi-experimental design, with a mixed qualitative-quantitative approach was used to analyze data collected from 112 adolescents in the second year of its implementation, in 2020–2021. Results suggest that (1) teachers' perceptions of student's socio-emotional skills in the post test showed more positive associations with the participation in the project, than participant's perceptions; (2) students identified eight types of lessons learned, the one most referred was the improvement of socio-emotional skills and learning about themselves; and (3) the combined opportunities for adolescents to learn more about themselves, to express themselves and to practice socio-emotional skills are important ingredients for their motivation and active engagement in the project. Overall, these results indicate that participation in the project is associated with positive outcomes for the adolescents and that both monitoring and evaluation data are very important to interpret the outcomes in a more comprehensive manner.

KEYWORDS

socio-emotional skills, online school radio, experimental project, adolescents, virtues and character strengths model, voice, citizenship

Introduction

Research has consistently shown the importance of implementing universal approaches to foster socio-emotional skills in adolescents (Durlak et al., 2011; Taylor et al., 2017; Mahoney et al., 2018). Socio-emotional skills include an individual's attitudes, internal states, approaches to tasks, management of behavior and feelings, and beliefs about the self and the world (OECD,

2021). The process by which children and youth develop these skills is named Social and Emotional Learning (SEL; Elias et al., 1997, p. 2).

The most widespread SEL program is Social and Emotional Learning, developed by *Collaborative for Academic, Social and Emotional Learning*, which addresses Self-awareness, Self-management, Responsible decision making, Social awareness and Relationship skills (CASEL, 2015). In recent years, the *Organisation for Economic Co-operation and Development* (OECD, 2021) has contributed to the SEL field with a conceptual model based on the Big Five framework (Kankaraš and Suarez-Alvarez, 2019). This model addresses the domains of Open-mindedness; Task performance; Engaging with others; Collaboration and Emotional regulation, each of them including more specific skills (OECD, 2021). A recent study and carried out in different cities around the world, including the United States, Canada, Colombia, South Korea, Finland, Turkey, Russian Federation, People's Republic of China, and Portugal (OECD, 2021), studied the relation between socio-emotional skills of children and adolescents and their school grades along with the scores obtained in a cognitive abilities test. Although the strength of the relations between certain socio-emotional skills and school grades was relatively weak, it was consistent (OECD, 2022). One of the frameworks that has been gaining considerable interest in the context of school-based SEL programs is the character strengths and virtues model (Peterson and Seligman, 2004). This model addresses 24 character strengths (e.g., Curiosity, Love, Teamwork, Prudence, Persistence), which are expressed through thoughts, feelings, and behaviors and grouped into 6 virtues: Wisdom and knowledge, Courage, Humanity, Transcendence, Temperance, and Justice (Peterson and Seligman, 2004). According to the authors, the use of these strengths would contribute to a meaningful and pleasant life. Several character strengths are positively correlated with positive outcomes, such as decreased behavioral problems, better school performance and social functioning (Park and Peterson, 2009; Shoshani and Slone, 2013), decreased levels of stress, depression and anxiety (Park and Peterson, 2009; Gillham et al., 2011; Proctor et al., 2011a; Wood et al., 2011), improved well-being and greater satisfaction in life (Proctor et al., 2011a; Abasimi et al., 2017; Kretzschmar et al., 2023).

Meta-analysis studies on SEL programs applied to different school levels have demonstrated positive outcomes in enhancing overall well-being, encouraging prosocial behaviors, improving academic achievements, and decreasing both externalizing and internalizing problems (Durlak et al., 2011; Sklad et al., 2012; Taylor et al., 2017; van de Sande et al., 2019). Also, education projects based on the character strengths and virtues model have shown positive outcomes (Proctor et al., 2011b; Silva, 2013; Kern and Kaufman, 2017).

Socio-emotional skills can be shaped through learning (Kautz et al., 2014; Gueldner et al., 2020). According to the CASEL model, these skills can be learned through instruction, practice, and feedback (Gueldner et al., 2020). The way that school-based SEL programs are implemented is critical for their success (Durlak and DuPre, 2008; Durlak et al., 2011). Researchers have identified some critical components of implementation that matter the most when it comes to outcomes, notably, Dosage: *How much of the program is delivered?*; Fidelity: *In which degree is the program being followed?*; Adaptation: *What changes are made to the original program?*; Quality of delivery: *How well is the program conducted?* and Participant responsiveness: *To what degree are the participants actively involved*? (Durlak, 2016). Evidence suggests that the level of implementation achievement is one of the most important factors affecting program outcomes (Durlak, 2016). A systematic review of 41 school-based mental health intervention studies found that 36% of the time, these critical components of implementation were positively associated with student outcomes (Rojas-Andrade and Bahamondes, 2019).

Historically, despite many SEL programs strongly focusing on learning and practicing socio-emotional skills (Taylor et al., 2017; Mahoney et al., 2018), they lack a community give-back component. In recent years, some SEL projects have stimulated children and youth's skills, by providing opportunities for active civic participation in their communities (Branquinho and Matos, 2016). Projects in which adolescents are active agents of change seem to contribute positively to socio-emotional development (Frasquilho et al., 2018). Dobia et al. (2020, p. 178) recommend a "greater emphasis on student voice and agency" for a more successful SEL implementation in secondary schools. Fewer projects have used radio as an instrument of youth participation and/or to develop socio-emotional skills (Jaime-Osorio et al., 2019; Ballinas-Gonzalez et al., 2020). In one of these studies, students were shown to have improved their oral and conversational skills, as well as their relationships (Jaime-Osorio et al., 2019). Since 2015, SEL has regaining importance in Portuguese Education. The Ministry of Education has adopted a humanistic framework, that reintroduced citizenship education into the curriculum and set expectations for students to develop socio-emotional skills.

This paper aims at presenting the *Semear Valores On-air* Academy, a project that was implemented for a 3-year period (2019–2022) in a Portuguese public school, involving 10 teachers and 249 students. It took place under the *Gulbenkian Academies for Knowledge* initiative, which supported more than 100 SEL projects – called "academies." This initiative adopted the OECD evaluation framework for socio-emotional skills. Based in the character strengths and virtues model (Peterson and Seligman, 2004), *Semear Valores On-air* challenged students to develop their socio-emotional skills and to create an online school radio. The project thus pushed students to use their voice as a positive influence, impacting their communities. Another goal is to understand the relationship between the participation in the academy and students' socio-emotional skills.

Description of the academy *Semear Valores on-air*

Pedagogical framework(s), and principles

The character strengths and virtues model (Peterson and Seligman, 2004) was used to foster a collaborative atmosphere and instill a sense of well-being and resilience. We invited students to recognize and appreciate the character strengths in themselves and in their colleagues and to intentionally use them in their day-to-day lives. Also, it served as the main theme for the radio scripts. Whatever theme students chose, they should look for character strengths (e.g., when talking about the soccer championship, they would discuss the teams' strengths; in an interview, they would ask a question about the interviewee's strengths).

Given the positive impact of active methods and practical approaches in promoting socio-emotional skills (CASEL, 2015; World

Economic Forum, 2016), we adopted a project pedagogy focused on creation (Figueiredo, 2017) combined with group dynamics.

We established the following guiding principles and prerequisites:

(1) The academy should be part of the students' curriculum and not an extracurricular activity. This maximizes students' attendance and promotes interdisciplinarity with other school subjects.
(2) The class director (i.e., the teacher who is responsible for a particular class in school) must be motivated to participate.
(3) Class directors collaborate with the academy's facilitators: they participate in the sessions, arrange the necessary spaces, give feedback, and are involved in the evaluation process.
(4) Class directors must attend an initial training.
(5) Students are encouraged to try different roles (e.g., radio announcer), different program formats and to continuously improve their work. This entails a different mindset from the one required by most of the pedagogical assignments. The grade is not the ultimate goal. They must improve their scripts and practice orally before recording. This implies to be open to feedback and go the extra mile to improve.
(6) Schools must provide appropriate rooms for different sessions: studio and classrooms with computers.

Objectives, pedagogical format and implementation

Our academy proposes a creative curriculum to promote students' socio-emotional skills, namely, communication, creative thinking, adaptability, and resilience, while empowering them to be active citizens.

The program curriculum was designed for one school year. The academy was implemented in a Portuguese school, from 2019 to 2022 in the Citizenship class, by two facilitators and two radio editors, all part-time workers. The first step was to get the studio and the equipment ready. The school appointed a project coordinator, who helped the team by selecting the participating classes, announcing the training to teachers, and booking adequate rooms.

As one can see in Figure 1, point 1, after selecting the classes, a four-hour training was built to introduce teachers to the academy and to the character strengths and virtues model. This training was mandatory for class directors and open to other school teachers. The first session was a seminar (point 2) which aimed to introduce the academy; to talk about the influence of radio worldwide; teach about the areas of radio (animation, programming and production) linked to different professions and raise awareness of the importance of communicating well. In the following three sessions (point 3, Figure 1), we collected the participants' data, introduced the 24 character strengths and invited participants to look at their own strengths and at their colleagues', through active methods. Students were organized into small groups (point 4) and each group chose a radio show format (point 5): doing an interview or talking about a subject. Afterwards, they had to choose the interviewee or the theme of the show (e.g., a film review, a biography). Then, groups researched on the topics selected. The process of script writing was fluid, and this was explained to students early on. After the first version of the script

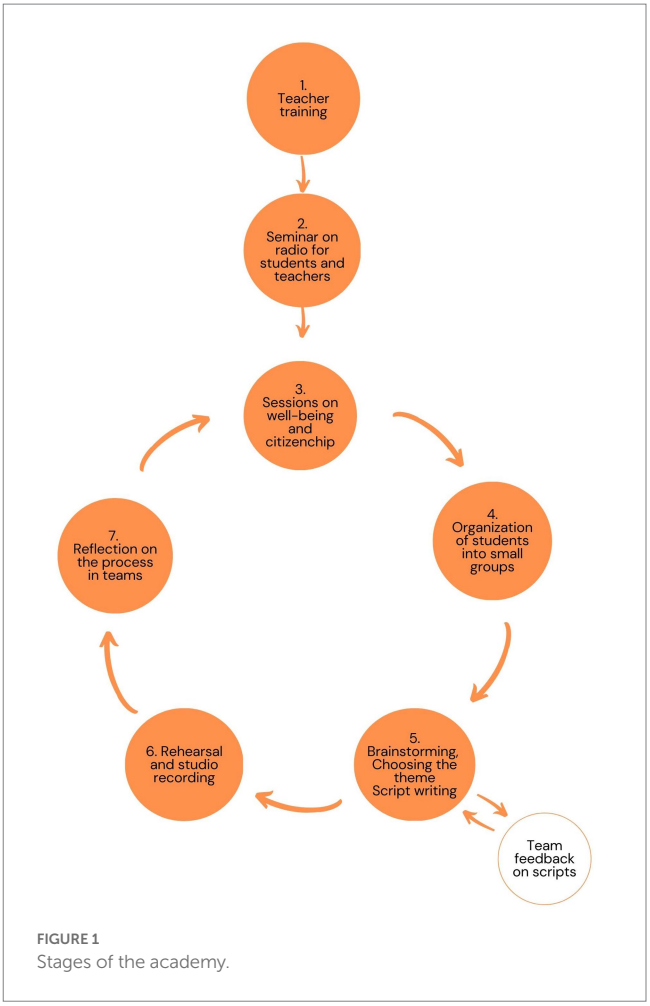


FIGURE 1
Stages of the academy.

was completed, the facilitators reviewed it and offered their suggestions. Feedback was essential for improving the scripts. When the scripts were ready, students rehearsed their lines, and a time was scheduled to record in studio (point 6, Figure 1). If the selected format was an interview, they had to arrange a time with the guests to record it. Depending on the maturity of the group, the scheduling could be intermediated by the team. The moment of recording was one of great excitement and some nervousness too. At this stage, it was important to calm the students down. Finally, each group was invited to reflect on how the whole group work process went (point 7). Throughout the school year, the groups had the opportunity to go through the entire process two to four times, depending on the efficiency of each group.

We expected that different types of sessions would develop different socio-emotional skills: (1) the script writing sessions would foster creative thinking and communication, (2) the studio recording sessions would promote communication and adaptability, and (3) the well-being sessions and the academy format itself would foster resilience, because it would take effort and time until the radio shows were ready to go on air.

The radio shows were professionally edited by the communication partner, which was also responsible for creating the online radio, named by the first year's participants as "MEGA Ibn radio." This partner also created a podcast channel with all the shows produced. To create a greater sense of belonging to the radio, each class chose a

name for the playlist, where all their programs sat. Both the online radio and the podcast channel were launched during the first year of the academy. On that day, all school listed to the radio launch. The online radio was broadcasted *via* internet to the world, 24/7 and APPs and the podcasts were broadcasted through Soundcloud. The broadcast routine included music and 3 daily shows.

The academy involved 10 classes from the 7th to the 12th grade. Some changes were made to the original plan, mainly because of the pandemic, the confinement and the lessons learned from the first year of the academy's implementation. For instance, the format of the sessions changed from face-to-face to remote, in the periods of confinement. In year 1 and 2 the well-being sessions were adapted to address the negative effects of the pandemic and confinement, by adding themes such as emotional expression and management, and promoting positive relationships. From learnings made during the first year, other changes were implemented: (a) a higher number of script writing lessons; (b) the criteria for selecting students (minimum 9th graders, once they were more fluent in writing); (c) use of more active methodologies; (d) reduced number of participants per working group and (e) opportunities for students to try out radio sound design.

We will present only the data from the second year of the academy's implementation, because the 1st year was a pilot and in the 3rd year data from teachers from the comparison group was missing.

Methods

Participants

In year 2, 84 students participated in the academy (intervention group, IG) and 54 composed the comparison group (CG). 61 (70.9%) attended the 9th grade, 25 (29.1%) the 11th grade. Half were female and half male, 83.7% were Portuguese and 8.1% were migrant students and their average age was 15.7 years old. Of the 54 students in the comparison group, 30 attended the 9th grade (55.6%) and 24 (44.4%) the 11th grade. 44.4% of the students were female and 50.0% male (5.6% did not answer), 92.6% were Portuguese and 1.9% migrants. Their average age was 15.2. The intervention group ($N = 84$) is statistically different from the comparison group ($N = 54$) in the variables youth's age, year of schooling (and others analyzed), so the results should be interpreted with caution.

Design, procedure and measures

This study used a quasi-experimental single-group design with a mixed qualitative-quantitative approach (Euzébio et al., 2021).

With the help of the main teacher, we asked adolescents and their parents for informed written consent for data collection and for voice recordings, separately. We also informed the adolescents and families about the goals of the data collection and confidentiality terms. Subsequently, the students agreed to complete the instruments voluntarily in the classroom, under the supervision of the teacher and at least one member of the academy's team. 138 students were invited to complete a socio demographic survey in September 2020, from which only 112 have done it. To assess students' socio-emotional skills, we invited the same group and their main teachers to answer an online reduced version of the Survey on Social and Emotional Skills (*SSES*), by Kankaraš and Suarez-Alvarez (2019). As shown in Table 1, the reduced version was composed by 6 of the total 17 subscales of SESS: *cooperation* (to assess communication); *creativity* (creative thinking); *persistence* (resilience); *optimism*; *responsibility* and *curiosity* (adaptability). The adapted instrument for teachers was composed of 18 items (3 items per subscale) and for students, of 48 items (8 items per subscale). These data were collected between September and October 2020 (pre-test), and in June 2021 (post-test). 116 students completed the SESS questionnaire during class: 74 from the IG and 42 from the CG. To the students from the CG, it was offered the opportunity to engage in one radio show. From the five teachers that completed the SESS, data from one was removed because it was incomplete, so only answers from 4 were considered (2 teachers from the IG and 2 from the CG). To the teachers from the CG, it was offered the opportunity to participate in a training.

For monitoring purposes, we assessed the program's dosage; responsiveness, quality, and fidelity/adaptability, using different assessment tools (Durlak and DuPre, 2008; Alexandre et al., 2019). Dosage was assessed by observing and registering attendance in each session. Responsiveness was assessed through online satisfaction surveys aimed at students, teachers, and partners. The survey for students gathered data on satisfaction with the activities and lessons learned; the survey for teachers assessed their satisfaction with training (i.e., interest in the topic, clarity of presentation, methodology used, workshop's relevance to the project, involvement of the participants); and finally, the survey for teachers and partners gathered

TABLE 1 Description of the socio-emotional skills evaluated and the correspondent SESS subscale and its description based on the assessment framework of Kankaraš and Suarez-Alvarez (2019).

Socio-emotional skill	Measured by the subscales (SSES)	Description (SESS)
Creative thinking	Creativity	"Generating novel ways to do or think about things through exploring, learning from failure, insight, and vision."
Resilience	Persistence	"Persevering in tasks and activities until they get done."
Communication	Cooperation	"Living in harmony with others and valuing interconnectedness among all people."
Adaptability	Optimism	"Positive and optimistic expectations for self and life in general."
	Responsibility	"Able to honor commitments and be punctual and reliable."
	Curiosity	"Interest in ideas and love of learning, understanding and intellectual exploration; an inquisitive mind-set."

information on the academy's overall functioning and asked for suggestions. To measure the program's quality, we used a criteria checklist, which included the verification of a set of conditions (e.g., training of facilitators; supervision/intervision; team meetings). Finally, fidelity/ adaptation was measured by verifying a checklist that measured the degree of completion of the planned sessions and adaptations.

Data analyses

Statistical analyses were conducted using IBM SPSS Statistics 22.0. Descriptive statistics were run to analyze socio demographic data. A two-way ANOVA was conducted to evaluate the main effects of the group (i.e., intervention vs. comparison group) and time (i.e., pre or post-test) on students' socio-emotional skills to determine if participation in the academy was associated with skills assessment. Pearson product–moment correlations were conducted to explore the relationships between dosage and each skill. Qualitative data analysis was explored with Excel, version 2,304, which allowed to organize students' feedback from the sessions into categories (Campos, 2004).

Results

Results from students' perceptions

Results indicated a significant interaction between the effects of time and group for Curiosity ($F(1, 114) = 9.27$, $p = 0.003$, partial $\eta^2 = 0.07$) and Adaptability subscales ($F(1, 114) = 4.09$, $p = 0.045$, partial $\eta^2 = 0.03$). Table 2 shows that for these skills, the students' perceptions in the intervention group decreased in the post test (curiosity) or maintained (adaptability), while the students' perceptions in the comparison group increased. There was no significant interaction between the effects of time and group for other skills.

There was a significant main effect for time in Responsibility ($p = 0.003$) and Adaptability ($p = 0.022$) skills: students' perceptions were significantly higher in post than pretest. There was no significant main effect for group in none of the skills.

TABLE 2 Descriptive statistics for SESS results, students' version.

Socio-emotional skill	Group	*M*	SD
Creativity Pretest	Comparison Group	3.69	0.51
	Intervention Group	3.69	0.51
Creativity Post test	Comparison Group	3.80	0.53
	Intervention Group	3.67	0.55
Persistence Pretest	Comparison Group	3.76	0.57
	Intervention Group	3.76	0.63
Persistence Post test	Comparison Group	3.93	0.58
	Intervention Group	3.75	0.58
Cooperation Pretest	Comparison Group	4.16	0.39
	Intervention Group	4.27	0.47
Cooperation Post test	Comparison Group	4.14	0.41
	Intervention Group	4.16	0.53
Optimism Pretest	Comparison Group	3.70	0.77
	Intervention Group	3.80	0.72
Optimism Post test	Comparison Group	3.80	0.63
	Intervention Group	3.86	0.70
Responsibility Pretest	Comparison Group	3.79	0.44
	Intervention Group	3.74	0.55
Responsibility Post test	Comparison Group	3.96	0.43
	Intervention Group	3.84	0.50
Curiosity Pretest	Comparison Group	3.83	0.45
	Intervention Group	3.97	0.48
Curiosity Post test	Comparison Group	3.92	0.53
	Intervention Group	3.83	0.49
Adaptability Pretest	Comparison Group	11.32	1.07
	Intervention Group	11.50	1.25
Adaptability Post test	Comparison Group	11.68	1.08
	Intervention Group	11.53	1.28

Results from teachers' perceptions

Results indicated a significant interaction between the effects of time and group for almost every skill: Creativity ($F(1, 94) = 70.90$, $p < 0.001$, partial $\eta^2 = 0.43$); Cooperation ($F(1, 94) = 19.95$, $p < 0.001$, partial $\eta^2 = 0.18$); Persistence ($F(1, 94) = 36.32$, $p < 0.001$, partial $\eta^2 = 0.28$); Responsibility ($F(1, 94) = 8.45$, $p = 0.005$, partial $\eta^2 = 0.08$); Adaptability ($F(1, 94) = 8.13$, $p = 0.005$, partial $\eta^2 = 0.08$); and Curiosity ($F(1, 94) = 5.74$, $p = 0.019$, partial $\eta^2 = 0.06$). Table 3 shows that for Creativity and Persistence, teachers' perceptions in the intervention group increased in the post test, while in the comparison group decreased. We observed the opposite for Cooperation and for Responsibility, Adaptability and Curiosity teachers' perceptions from both groups increased in the post test.

There was a significant main effect for time in Curiosity ($p < 0.001$); Responsibility ($p < 0.001$); Adaptability ($p < 0.001$); Creativity ($p = 0.009$); Optimism ($p = 0.009$) and Persistence ($p = 0.031$). For all of these, teachers' perceptions were significantly higher in post than pretest. There was a significant main effect for group in Curiosity ($p < 0.001$) and Adaptability ($p = 0.008$): teachers' perceptions were significantly higher in the comparison group than in the intervention group.

Dosage data

On average, each class had one seminar on introduction to radio, 7 lessons on well-being, 10.5 script writing lessons, 15.7 recording sessions and 2 sound design lessons. Students' participation rate was in average, 93% and they have recorded 58 radio shows.

Correlation between dosage and outcomes

Pearson analyses shows a significant positive correlation between Dosage and Responsibility, [r (73) = 0.26, $p = 0.029$], Curiosity [r (73) = 0.24, $p = 0.038$], Persistence [r (73) = 0.27, $p = 0.020$] and

TABLE 3 Descriptive statistics on SESS results, teachers' version.

Socio-emotional Skill	Group	*M*	SD
Creativity Pretest	Comparison Group	3.70	0.78
	Intervention Group	3.46	0.56
Creativity Post test	Comparison Group	3.44	0.67
	Intervention Group	3.95	0.74
Persistence Pretest	Comparison Group	4.13	0.93
	Intervention Group	3.81	0.69
Persistence Post test	Comparison Group	3.90	0.81
	Intervention Group	4.31	0.76
Cooperation Pretest	Comparison Group	3.95	0.79
	Intervention Group	4.13	0.52
Cooperation Post test	Comparison Group	4.22	0.59
	Intervention Group	3.85	0.65
Optimism Pretest	Comparison Group	4.13	0.64
	Intervention Group	4.12	0.45
Optimism Post test	Comparison Group	4.21	0.47
	Intervention Group	4.25	0.38
Responsibility Pretest	Comparison Group	3.92	0.67
	Intervention Group	3.57	0.62
Responsibility Post test	Comparison Group	4.12	0.66
	Intervention Group	4.02	0.80
Curiosity Pretest	Comparison Group	4.49	0.56
	Intervention Group	3.83	0.53
Curiosity Post test	Comparison Group	4.67	0.39
	Intervention Group	4.22	0.60
Adaptability Pretest	Comparison Group	12.55	1.65
	Intervention Group	11.52	1.33
Adaptability Post test	Comparison Group	13.00	1.37
	Intervention Group	12.49	1.50

Adaptability [$r\,(73) = 0.25$, $p = 0.036$] perceived by teachers in the post test. There was no significant correlation between dosage and self-perceived skills by students.

Students' responsiveness

Eighty-two out of 92 students prefer the recording sessions (53 responses), followed by lessons on well-being and citizenship (33) and finally, script writing lessons (16). They considered that the academy was interesting (3.9 out of 5 points) and useful (3.5 out of 5 points).

On lessons learned, eight themes emerged ($N = 81$): (a) socio-emotional skills (e.g., teamwork, communication); (b) learning about themselves (e.g., strengths, skills, personal interests); (c) learning about their colleagues; (d) technical skills (e.g., script writing, recording); (e) character strengths; (f) thoughts/ perspective on things; (g) how radio operates; and (h) other factual learning (e.g., about people, professions). Table 4 shows the number of references and examples for each category. Six students answered that they have not learned anything or that they did not know.

TABLE 4 Learning reported by students: categories, number of references and examples ($N = 81$).

Categories	References	Examples
Improving socio-emotional skills (e.g., teamwork, communication)	twenty-nine	*"I strengthened my ability to work as a team, my ability to concentrate and learned to share leadership."*
Learning about themselves (e.g., strengths, skills, personal interests)	twenty-four	*"In the first sessions I was able to learn more about myself and my colleagues and reflect on my ability and skills."*
Learning about their colleagues	seventeen	*"I learned more about my group mates, and so nowadays we get along better."*
Improving technical skills (e.g., script writing, recording)	fifteen	*"I learned how to develop a theme and how to make a script."*
Learning about character strengths (e.g., what they are, their importance)	thirteen	*"I learned that we all have character strengths, some are well developed but the others need a little more work."*
Thoughts, perspective on things	ten	*"I learned that we see ourselves in a different way from other people."*
Learning about how radio operates	nine	*"I learned more about radio, since nowadays my generation does not use it as much."*
Other factual learning (e.g., about people, professions)	seven	*"I learned a lot from the scripts, because we developed topics about which I did not have much knowledge and we did a very interesting interview that brought me a lot of information."*

Another, more subjective survey asked the 9th grade participants how they were experiencing the academy. From the 66 answers, three main points stand out. The first one was the positive feelings about the academy:

> *"This project brings me a lot of energy, enthusiasm and joy!"*

The learning/ improving of socio-emotional skills was another:

> *"… I have also learned to improve my ability to speak in audiences with more people."*

Finally, the feeling of freedom to choose the themes was very appreciated by students:

> *"I feel a sense of freedom when I am able to say what I want, because we have to develop the subject a lot."*

Discussion

The data interpretation and discussion that follows should be read with caution, since the two groups are not comparable in some of the variables.

We found significant increases in the teachers' perceptions of student's socio-emotional skills namely, creativity, persistence, responsibility, adaptability, and curiosity, by the end of the academy. When analyzing these results, we must consider the main effect of time, which is not a surprise, given the "normal" youth development. Nevertheless, teachers' perceptions of student's creativity and persistence only increased for the students in the intervention group, which suggests a positive relation between the participation in the academy and the development of such skills. These findings corroborate that socio-emotional skills can be shaped through learning (Kautz et al., 2014; Gueldner et al., 2020). Some authors suggest that instruction, practice, and feedback may be the most important elements for promoting socio-emotional skills (Gueldner et al., 2020; Danner et al., 2021). The academy staff and some teachers highlighted the opportunity that students had to review and improve their scripts after feedback had been given. One of the teachers (of Portuguese Language) mentioned that this training allowed the students to improve their written expression. Based on students' responsiveness, we hypothesize that the opportunities for rehearsing and recording the radio shows might have been an important feature to improve student's oral communication.

One aspect that may have contributed to the effectiveness of the academy was the positive climate of the classroom. According to Durlak and DuPre (2008, p.337) the "positive work climate" is an organizational specific factor that affects program implementation. From the qualitative analyses, we know that students associated positive emotions—"energy, enthusiasm and joy"—to the academy, which we believe has contributed to maintain their motivation, especially in the most challenging moments (e.g., scripts writing and covid confinement).

Results show that students' involvement in the academy (dosage) was positively correlated with teachers' perception of students' responsibility, curiosity, persistence, and adaptability. This can be interpreted in two ways: teachers' perception was positively influenced by students' attendance and participation in the sessions, or the more students participated, the more teachers were able to observe their progress. Research shows that dosage is related to the efficacy of socio-emotional development programs (Durlak, 2016; Rojas-Andrade and Bahamondes, 2019), so possibly students' involvement has contributed to their socio-emotional skills' development.

Teachers gave worse ratings to students' ability to cooperate by the end of the academy. This may have happened because prior to the academy, teachers had fewer opportunities to observe their students engaging in cooperative work and, thus a more optimistic perception was held by teachers at the beginning of the school year. We also realized that students did not have training in group working, prior to the academy. Teamwork is not a widespread approach in Portuguese middle and high school education system. Another explanation may lie in the fatigue that students might have felt at the end of the school year and that may have affected their tolerance and ability to work in a more cooperative fashion.

In post-test results, participants either perceived themselves worse or there were no significant differences for curiosity and adaptability, compared with self-perceptions of students from the comparison group. An explanatory hypothesis may be the "John Henry" effect, as mentioned in the literature, in which the comparison group seeks to compensate for not being part of the project with an extra effort to develop these skills (Murnane and Willett, 2010).

It is worth mentioning that this study used self-reported measures, reflecting adolescent's perceptions of their own skills, based on their knowledge of themselves at a given moment in their lives, thus influenced by biases (Vazire and Carlson, 2011) and developmental factors (Soto et al., 2021). The evaluation outcomes from 34 academies under the major program *Gulbenkian Academies of Knowledge (AGC),* where *Semear Valores On-air* was included, also revealed that teachers and professionals were the ones reporting the greatest changes in participants' socio-emotional skills, while children and adolescents reported minor changes (Castro et al., 2022). These results led the AGC evaluation team to question if the self-awareness gained during the project would be responsible for these findings in students' perceptions (Castro et al., 2022). It may have happened that, before participating in the academy, students were less aware of their skills' level, which led them to formulate a less realistic perception of their own skills, compared to the end of the project. Students' feedback highlighted an increased awareness of their skills and personal strengths. Adolescents also mentioned that they improved some socio-emotional skills, like teamwork, despite quantitative analysis not showing any improvement in cooperation skills. This hypothesis of overestimation of competencies is in line with a recent OECD (2022) study which shows that Portuguese adolescents, compared to the international average, reported a higher skill level in more skills than children, namely, in collaboration (of which cooperation is a subscale). To overcome this limitation, Soto et al. (2021) suggest more comprehensive forms to evaluate socio-emotional skills, like performance-based assessments for specific skills (e.g., *creativity*; Torrance, 1966), or situational judgment tests where hypothetical scenarios calling for certain skills are presented and the effectiveness of individuals' selected responses are graded (e.g., *emotion regulation*; MacCann and Roberts, 2008). The use of behavioral checklists and rating scales (e.g., *social skills*, Goldstein and McGinnis, 1997) is also a complementary way to assess socio-emotional skills not prone to participants' biases.

Dosage data, meaning the degree of students' attendance and participation in sessions was very high. We believe that that happened for two main reasons. The first is that the academy was integrated in class/ school curriculum plus, the main teacher was an ally of the team, meaning students had to attend the sessions. However, the number of radio shows that each group created and recorded was entirely dependent on students' motivation and that number met or exceeded expectations. There are not many studies comparing mandatory versus voluntary participation in SEL programs (e.g., an

exception is Meyer et al., 2019), but we know that *whole school approaches* are more effective (Durlak and DuPre, 2008; Dobia et al., 2020). A second reason may be the appealing methods and activities proposed, which allowed students to be heard, to create, to get to know each other better and oneself, and to be positive agents in their communities. Several authors (Figueiredo, 2017; Frasquilho et al., 2018; Dobia et al., 2020) advocate for the importance of creating such opportunities to engage students in universal SEL programs.

We must consider some limitations of the present study. Firstly, the instruments used to assess socio-emotional skills measured respondents' perceptions, thus subjected to biases and developmental factors. The academy's evaluation would have benefited from more objective measures, such as the observation and recording of the participants' behavior related to communication and other socio-emotional skills, during some specific assignments. The second limitation is not having done a follow-up assessment to see if changes sustained in time. Finally, although it was not our goal to study the relationship between socio-emotional skills and other dimensions, the project would have benefited from collecting students' grades and comparing them with student's socio-emotional skills.

We believe that the present paper contributes to the design and implementation of SEL programs, by (1) showing how the model of character strengths and virtues (Peterson and Seligman, 2004) can inform a SEL project, (2) how one can use project pedagogy focused on the creation of a radio to help adolescents develop socio-emotional skills, and (3) how one can help adolescents to express themselves through their voice, making SEL programs more appealing to youth in this stage of development. It contributes to research on the SEL field, by (1) showing how implementation data adds, *per se*, important information to the project outcomes and helps to better interpret the results on socio-emotional skills, and (2) suggesting that teachers' perceptions are more sensitive to changes in student's socio-emotional skills.

Conclusion

Adolescents' socio-emotional skills can be fostered in school contexts through SEL programs, with numerous benefits. The present paper presented an online school radio SEL project and program, *Semear Valores On-air*. We analyzed (1) the association between participation in the project and the perceived skills of adolescents; (2) the association between programs' dosage and the perceived socio-emotional skills; and (3) the participants' qualitative feedback about the project. Our quantitative findings suggest that adolescents can be actively engaged in SEL projects and that their participation seems to be associated with modest positive outcomes in their socio-emotional skills, which seems to contrast, to some extent, to students' qualitative feedback that highlights skills' learning. In addition, this project shows how one can build up a SEL program based on the virtues and character strengths model combined with a project methodology that enables adolescents to create new products and to express themselves through their voice. Given the advantages of SEL programs (Durlak et al., 2011; Sklad et al., 2012; Kern and Kaufman, 2017; Taylor et al., 2017; van de Sande et al., 2019) it is important to keep monitoring the implementation of SEL interventions and to broaden the measurement of socio-emotional skills with other more objective methods. Our findings add to the previous literature (OECD, 2021) that teachers' perceptions seem to be more sensitive to changes in students' socio-emotional skills. In addition, it shows that participants' involvement (dosage) and responsiveness are very important in interpreting the evaluation outcomes in a more comprehensive manner.

Author's note

Research has consistently shown the importance of implementing universal approaches to foster social and emotional skills in adolescents. These skills include an individual's attitudes, internal states, approaches to tasks, management of behavior and feelings, and beliefs about the self and the world that shape social interactions. Few projects have used adolescents' voice and the radio as a way to foster socio-emotional skills. Semear Valores On-air academy was a three-year project that aimed to develop students' socio-emotional skills, through an online school radio, where students worked collaboratively to create radio shows and were announcers at a recording studio. The innovative curriculum motivated the students to participate, while at the same time, allowed them to develop their socio-emotional skills and empowered them as active citizens, as they reported. This article provides new ideas to stimulate the participation of adolescents that can be useful to other SEL projects and deserves further investigation. Finally, we show that even when face-to-face interaction is not possible, we can, with some adaptations, deliver the activities in creative ways that allow students to continuously develop their socio-emotional skills.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Ethics statement

Ethical approval was not required for the study involving humans in accordance with the local legislation and institutional requirements. The studies were conducted in accordance with the local legislation and institutional requirements. Written informed consent to participate in this study was provided by the participants' legal guardian/next of kin. Written informed consent to record the participants' voices was also provided by the participants and the participants' legal guardian/next of kin.

Author contributions

All authors listed have made a substantial, direct, and intellectual contribution to the work and approved it for publication.

Funding

The author(s) declare financial support was received for the research, authorship, and/or publication of this article.

Acknowledgments

A thankful note to the academy's partners—*Associação a Vida Ama-me*, *Ibn Mucana School*, *DONE Comunicação*; its funders—*Municipality of Cascais* and *Calouste Gulbenkian Foundation*—and to the consulting evaluation team.

Conflict of interest

This study received funding from Calouste Gulbenkian Foundation (CGF), as part of the Gulbenkian Programme for Knowledge and from Municipality of Cascais. The funder CGF had the following involvement with the study: providing training and mentorship on program evaluation to the academy team and the selection of the evaluation instrument (SESS), common to all the academies that have participated. The funder Municipality of Cascais was not involved in the study design, collection, analysis, interpretation of data, the writing of this article or the decision to submit it for publication. All authors declare no other competing interests.

Publisher's note

References

Abasimi, E., Gai, X., and Wang, G. (2017). Character strengths and life satisfaction of high school students. *Int. J. Appl. Psychol.* 7, 36–43. doi: 10.5923/j.ijap.20170702.02

Alexandre, J., Barata, M. C., Castro, C., and Colaço, C. (2019). *Manual para a monitorização e avaliação das Academias Gulbenkian do Conhecimento: Orientações iniciais*. Lisboa: Fundação Calouste Gulbenkian.

Ballinas-Gonzalez, R., Sanchez, B., Rodriguez-Paz, M. X., and Nolazco-Flores, J. A.. (2020), How the use of an internet radio program and podcast helped civil engineering students engage with local communities in need. Paper presented at 2020 ASEE Virtual Annual Conference Content Access, Virtual Online.

Branquinho, C., and Matos, M. G. (2016). "Dream Teens: Uma geração autónoma e socialmente participativa. [Dream teens: An autonomous and social participative generation]" in *Avaliação e Promoção das Competências Socioemocionais em Portugal*. eds. I. A. M. Pinto and R. Raimundo (Lisboa: Coisas de Ler), 421–440.

Campos, C. J. C. (2004). Método de análise de conteúdo: ferramenta para a análise de dados qualitativos no campo da saúde. *Rev. Bras. Enferm.* 57, 611–614. doi: 10.1590/S0034-71672004000500019

CASEL (2015). *CASEL guide: Effective social and emotional learning programs: Middle and high School edition*. Chicago, IL: CASEL.

Castro, C., Colaço, C., Barata, C., and Alexandre, J. (2022). "Comunicação & Disseminação – Parte II" in *O ADN da minha Academia* (Lisboa: Fundação Calouste Gulbenkian)

Danner, D., Lechner, C. M., and Spengler, M. (2021). Editorial: do we need socio-emotional skills? *Front. Psychol.* 12, 1–3. doi: 10.3389/fpsyg.2021.723470

Dobia, B., Arthur, L., Jennings, P., Khlentzos, D. S., Parada, R. H., Roffey, S., et al. (2020). "Implementation of social and emotional learning" in *Rethinking learning: A review of social and emotional learning for education systems*. eds. N. C. Singh and A. Duraiappah, (Mahatma Gandhi Institute of Education for Peace and Sustainable Development). 157–186.

Durlak, J. A. (2016). Programme implementation in social and emotional learning: basic issues and research findings. *Camb. J. Educ.* 46, 333–345. doi: 10.1080/0305764X.2016.1142504

Durlak, J. A., and DuPre, E. P. (2008). Implementation matters: a review of research on the influence of implementation on program outcomes and the factors affecting implementation. *Am. J. Community Psychol.* 41, 327–350. doi: 10.1007/s10464-008-9165-0

Durlak, J. A., Weissberg, R. P., Dymnicki, A. B., Taylor, R. D., and Schellinger, K. B. (2011). The impact of enhancing students' social and emotional learning: a meta-analysis of school-based universal interventions. *Child Dev.* 82, 405–432. doi: 10.1111/j.1467-8624.2010.01564.x

Elias, M. J., Zins, J. E., Weissberg, R. P., Frey, K. S., Greenberg, M. T., Haynes, N. M., et al. (1997). *Promoting social and emotional learning: Guidelines for educators*. Alexandria, VA: Association for Supervision and Curriculum Development.

Euzébio, C., Soares, D., and Soares, T. (2021). "Reflexão Crítica sobre estudos Quasi-Experimentais" in *Reflexões em torno de metodologias de investigação. Métodos*. eds. A. Moreira, P. Sá and A. P. Costa (Aveiro: Universidade de Aveiro), 81–92.

Figueiredo, A. D. (2017). Que pedagogias para as próximas décadas? [Conference session]. I Encontro regional de tecnologias na educação, Ponta Delgada. Available at: https://www.forma-te.com/mediateca/viewdownload/114/33316. (Accessed April 10, 2023).

Frasquilho, D., Ozer, E. J., Ozer, E. M., Branquinho, C., Camacho, I., Reis, M., et al. (2018). Dream teens: adolescents-led participatory project in Portugal in the context of the economic recession. *Health Promot. Pract.* 19, 51–59. doi: 10.1177/1524839916660679

Gillham, J., Adams-Deutsch, Z., Werner, J., Reivich, K., Coulter-Heindl, V., Linkins, M., et al. (2011). Character strengths predict subjective well-being during adolescence. *J. Posit. Psychol.* 6, 31–44. doi: 10.1080/17439760.2010.536773

Goldstein, A. P., and McGinnis, E. (1997). *Skill streaming the adolescents: New strategies and perspectives for teaching prosocial skills*. *Revised* Edn. Champaign, Illinois: Research Press.

Gueldner, B. A., Feuerborn, L. L., and Merrell, K. W. (2020). *Social and emotional learning in the classroom: Promoting mental health and academic success*. Guilford Publications: New York, NY.

Jaime-Osorio, M. F., Caicedo-Muñoz, M. C., and Trujillo-Bohórquez, I. C. (2019). A radio program: a strategy to develop students' speaking and citizenship skills. *HOW J.* 26, 8–33. doi: 10.19183/how.26.1.470

Kankaraš, M., and Suarez-Alvarez, J. (2019). *Assessment framework of the OECD study on social and emotional skills*. OECD Education Working Papers, 207. OECD Publishing, Paris.

Kautz, T., Heckman, J. J., Diris, R., Ter Weel, B., and Borghans, L. (2014). *Fostering and measuring skills: Improving cognitive and non-cognitive skills to promote lifetime success*. OECD Education Working Papers 110, Paris: OECD Publishing.

Kern, M. L., and Kaufman, S. B. (2017). "Research in positive education" in *The state of positive education*. ed. E. Larson (Dubai, UAE: World Government Summit/International Positive Education Network (IPEN)), 29–33.

Kretzschmar, A., Harzer, C., and Ruch, W. (2023). Character strengths in adults and adolescents: their measurement and association with well-being. *J. Pers. Assess.* 105, 34–47. doi: 10.1080/00223891.2022.2043879

MacCann, C., and Roberts, R. D. (2008). New paradigms for assessing emotional intelligence: theory and data. *Emotion* 8, 540–551. doi: 10.1037/a0012746

Mahoney, J. L., Durlak, J. A., and Weissberg, R. P. (2018). An update on social and emotional learning outcome research. *Phi Delta Kappan* 100, 18–23. doi: 10.1177/0031721718815668

Meyer, M., Neumayr, M., and Rameder, P. (2019). Students' community service: Self-selection and the effects of participation. *Nonprofit Volunt. Sect. Q.* 48, 1162–1185. doi: 10.1177/0899764019848492

Murnane, R., and Willett, J. (2010). *Methods matter: Improving causal inference in educational and social science research*. New York: Oxford University Press.

OECD (2021). *Beyond academic learning: First results from the survey of social and emotional skills*. OECD Publishing, Paris.

OECD (2022). "Survey on social and emotional skills (SSES): Sintra (Portugal)" in *Beyond academic learning: First results from the survey of social and emotional skills* (Paris: OECD Publishing)

Park, N., and Peterson, C. (2009). Character strengths: research and practice. *J. Coll. Character* 4, 1–10. doi: 10.2202/1940-1639.1042

Peterson, C., and Seligman, M. E. P. (2004). "Character strengths and virtues" in *A handbook and classification* (New York; Washington, DC: Oxford University Press; American Psychological Association)

Proctor, C., Maltby, J., and Linley, P. (2011a). Strengths use as a predictor of well-being and health-related quality of life. *J. Happiness Stud.* 12, 153–169. doi: 10.1007/s10902-009-9181-2

Proctor, C., Tsukayama, E., Wood, A. M., Maltby, J., Eades, J. F., and Linley, P. A. (2011b). Strengths gym: the impact of a character strengths-based intervention on the life satisfaction and well-being of adolescents. *J. Positive Psychol.* 6, 377–388. doi: 10.1080/17439760.2011.594079

Rojas-Andrade, R., and Bahamondes, L. L. (2019). Is implementation fidelity important? A systematic review on school-based mental health programs. *Contemp. Sch. Psychol.* 23, 339–350. doi: 10.1007/s40688-018-0175-0

Shoshani, A., and Slone, M. (2013). Middle school transition from the strengths perspective: young adolescents' character strengths, subjective well-being, and school adjustment. *J. Happiness Stud.* 14, 1163–1181. doi: 10.1007/s10902-012-9374-y

Silva, M. R. (2013). 'Educar nas Virtudes. Programa de intervenção para students do 1° ciclo do ensino básico'. PhD thesis, Lisbon University, accessed 15 April 2023 from University of Lisboa Repository.

Sklad, M., Diekstra, R., De Ritter, M., and Ben, J. (2012). Effectiveness of school-based universal social, emotional, and behavioral programs. do they enhance students' development in the area of skill, behavior, and adjustment? *Psychol. Schools* 49, 892–909. doi: 10.1007/s40688-018-0175-010.1002/pits.201641

Soto, C. J., Napolitano, C. M., and Roberts, B. W. (2021). Taking skills seriously: toward an integrative model and agenda for social, emotional, and behavioral skills. *Curr. Dir. Psychol. Sci.* 30, 26–33. doi: 10.1007/s40688-018-0175-010.1177/0963721420978613

Taylor, R., Oberle, E., Durlak, J., and Weissberg, R. (2017). Promoting positive youth development through school-based social and emotional learning interventions: a meta-analysis of follow-up effects. *Child Dev.* 88, 1156–1171. doi: 10.1111/cdev.12864

Torrance, E. P. (1966). *The Torrance tests of creative thinking—norms, technical manual research edition–verbal tests, forms a and B—figural tests, forms a and B.* Princeton: Personnel Press.

van de Sande, M. C. E., Fekkes, M., Kocken, P. L., Diekstra, R. F. W., Reis, R., and Gravesteijn, C. (2019). Do universal social and emotional learning programs for secondary school students enhance the competencies they address? A systematic review. *Psychol. Sch.* 56, 1545–1567. doi: 10.1002/pits.22307

Vazire, S., and Carlson, E. N. (2011). Others sometimes know us better than we know ourselves. *Curr. Dir. Psychol. Sci.* 20, 104–108. doi: 10.1177/0963721411402478

Wood, A. M., Linley, P. A., Maltby, J., Kashdan, T. B., and Hurling, R. (2011). Using personal and psychological strengths leads to increases in well-being over time: a longitudinal study and the development of the strengths use questionnaire. *Personal. Individ. Differ.* 50, 15–19. doi: 10.1016/j.paid.2010.08.004

World Economic Forum (2016). *New vision for education: Fostering social and emotional learning through technology*. Geneva. Available at: http://www3.weforum.org/docs/WEF_New_Vision_for_Education.pdf (Accessed April 15, 2023).

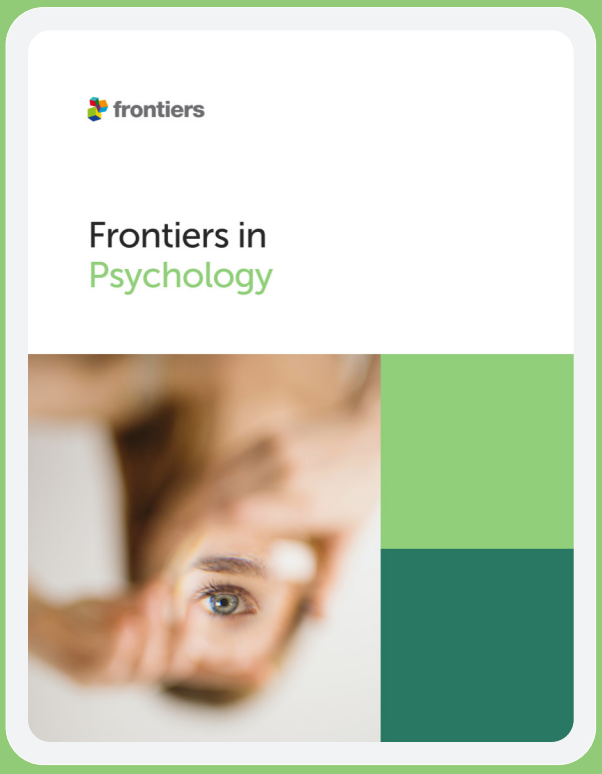
Frontiers in Psychology

Paving the way for a greater understanding of human behavior

The most cited journal in its field, exploring psychological sciences - from clinical research to cognitive science, from imaging studies to human factors, and from animal cognition to social psychology.

Discover the latest Research Topics

See more →



Frontiers

Avenue du Tribunal-Fédéral 34
1005 Lausanne, Switzerland
frontiersin.org

Contact us

+41 (0)21 510 17 00
frontiersin.org/about/contact