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Parental influence on child social and emotional functioning

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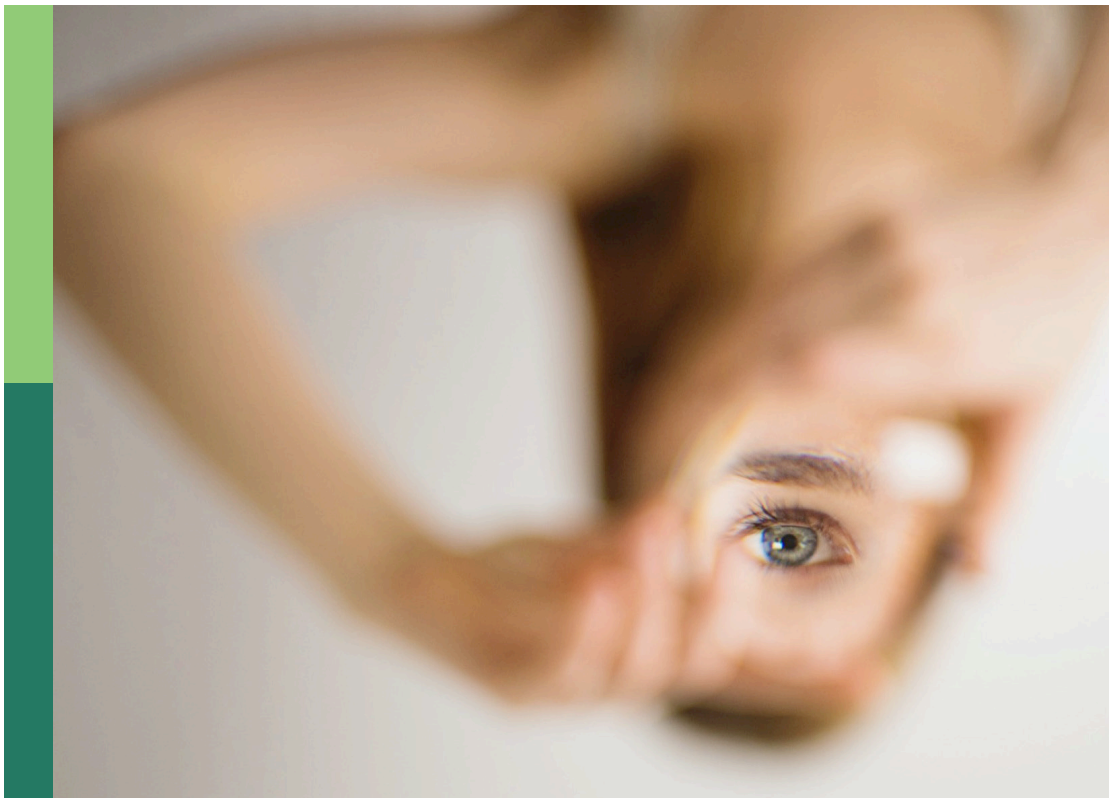

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Parental influence on child social and emotional functioning

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Editorial: Parental influence on child social and emotional functioning

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parenting, family, social adjustment, child development, mental health, youth wellbeing

Editorial on the Research Topic
Parental influence on child social and emotional functioning

An individual with healthy social and emotional functioning can experience, express, and manage emotions well, form and sustain positive social relationships, and adapt to social contexts effectively, which is essential for a person's overall healthy functioning and mental health, especially among children and adolescents (Mahoney et al., 2021). Research suggests that children who have positive social-emotional health tend to be happier, demonstrate better academic performance, and display fewer problematic behaviors than less socially and emotionally competent peers (Malti and Song, 2018; Collie, 2022; Guo et al., 2023). Such powerful effects are long-lasting and can extend from early years to adulthood (Luecken et al., 2013).

Worldwide, there is a consensus that social and emotional development is a result of individual-context interactions (Lerner and Castellino, 2002). Children learn and practice their social-emotional skills in social interactions with parents, peers, and teachers. Particularly, socialization perspectives regard parenting as the primary factor that shapes child and adolescent development to a large extent (McDowell et al., 2002). Despite that a large number of empirical studies have linked different parenting practices to child and adolescent social-emotional development, the underlying psychological and behavioral mechanisms are still largely unknown, especially with regard to different age groups (e.g., young children and adolescents) and different contexts (e.g., rural-urban or cultural disparities). Another neglected area of research relates to how parental mental health may affect children's outcomes and in what ways. Thus, this Research Topic aims to enrich the existing literature in the field by welcoming submissions from different disciplines (e.g., psychology and social work) that may employ different research methods, such as quantitative, qualitative, systematic review, and conceptual studies.

Early interactions with parents are critical for children to understand oneself, others, and the world. Parents may have different socialization practices, thus introducing different developmental trajectories to children (Kochanska et al., 2019). A nurturing, encouraging, and warm family environment often reflects healthy parent-child relationships that promote positive development and adjustment among young children; on the contrary, a family context characterized by stress, neglect, rejection, or dysfunctions would put children at risk for maladjustment later in life (Krauss et al., 2020; Ward and Lee, 2020; Zhu and Shek, 2021; Chen et al., 2022). In this Research Topic, six articles enriched the literature by discussing parenting practices and parental influences among preschool children.

King et al. reported three latent profiles of parental emotion socialization processes in terms of emotion coaching, emotion dismissing, and emotion disengagement among Western parents of children aged 4–10 years. The finding empirically supports emotion socialization theories that advocate differentiated classification of emotion coaching (i.e., parents validate and teach children about emotions) and emotion-dismissing (i.e., parents minimize and dismiss their children's emotions) in parenting. Future research should focus on how these distinct parental emotional socialization strategies would affect children's development.

Li and collaborators illustrated how parenting styles were associated with child development among Chinese preschool children in two articles. The article by Li et al. (a) entitled "*The association between authoritarian parenting style and peer interactions among Chinese children aged 3–6: an analysis of heterogeneity effects*" reported the negative effects of authoritarian parenting on children's peer interactions. Such effects were stronger among boys, younger children, or children with siblings. The second article by Li et al. (b) entitled "*Parenting style and children emotion management skills among Chinese children aged 3–6: the chain mediation effect of self-control and peer interactions*" further described the negative and positive predictive effects of authoritarian and authoritative parenting styles, respectively, on children's emotion management skills through the chain medication effects of children's self-control and peer interactions. Also focusing on Chinese preschool children, Zhao et al. found that parents with high parenting stress were less likely to exercise authoritative parenting, which hindered preschoolers' learning approaches. In addition, compared to migrant children, native children benefited more from an authoritative parenting style.

Chen further investigated how parental mental health was associated with child development among preschool Chinese children. The results showed that parental depression was likely to increase parental stress and child maltreatment, which in turn jointly raised the risk of child internalizing and externalizing problems. The study by Jiang et al. showed the long-term effect of parental absence in early years. They found that individuals living without parents during childhood and adolescence reported worse physical and mental health status in adulthood, regardless of age and gender.

Findings from these studies support the essential and long-lasting influence of interactions between children and their parents in their early years. In short, parents' mental health and wellbeing may to some extent determine their parenting practices, such as emotional socialization approaches, and authoritarian or authoritative parenting styles, which may subsequently influence their young children's social, emotional, and behavioral adjustment. Such pathways are likely to hold in different contexts despite stronger effects among certain groups (e.g., boys).

When children enter adolescence, their development is characterized by a growing need for independence from parents and expanding social interactions beyond family. Nevertheless, parenting and parent-adolescent relationships still serve as a significant shaping force in adolescent development (Zhu and Shek, 2021; Zhou et al., 2024). Nine studies included in this Research Topic demonstrate significant parental effects among adolescents in different cultures.

First, three studies revealed the effect of overall family environmental factors on Chinese adolescents and explored mediation and moderation pathways. Zhou et al. reported on the relationship between family intimacy and peer relationships among Chinese adolescents with psychological capital and self-identity serving as a mediator and a moderator, respectively. Specifically, a higher level of family intimacy was significantly associated with adolescents' stronger psychological capital, which in turn led to better peer relationships. Furthermore, such associations were stronger among adolescents with stronger self-identity. Cui et al. found that family function was a positive predictor of adolescent altruistic behavior through the chain mediation effect of self-affirmation and psychological resilience. Lai and Chen found that family cohesion and adaptability were negative predictors of depression, which positively predicted non-suicidal self-injury (NSSI) among adolescents. Further, the association between depression and NSSI was mitigated by school connectedness, highlighting the protective effect of ties between adolescents and the school.

Second, six articles, including one meta-analysis and one conceptual article, focused on specific parental factors. Habibi Asgarabad et al. demonstrated the positive link between parental psychological control as an intrusive parenting behavior and adolescents' externalizing (e.g., aggression and rule-breaking) and internalizing (e.g., depression and withdrawal) problems in Iran by firstly establishing psychometric properties of a Persian version of the Psychological Control Scale-Youth Self-Report (PCS-YSR). Pan et al.'s meta-analysis reviewed 35 studies and identified a significant positive relationship between parents' use of corporal punishment and a spectrum of violent behaviors among adolescents such as aggression, anti-social behavior, and criminal behavior, with a small to medium pooled effect size. The effect was independent of developmental stage (childhood vs. adolescence vs. adulthood), gender, culture, and type of violence. However, the association was stronger when corporal punishment was more severe.

Ratliff et al. reported significant positive links between supportive parent-adolescent relationships and positive adjustment among American adolescents in terms of more prosocial behavior, less aggressive behavior, and fewer depressive symptoms, which were significantly mediated by adolescent emotional regulation. Such pathways were more salient among adolescent boys in comparison to adolescent girls. Boullion et al. also reported the mediation effect of emotional regulation in linking parental factors and developmental outcomes among adolescents in the United States. They found that perceived parental warmth and affection at age 12 predicted adolescents' reduced use of expressive suppression emotion regulation strategy at age 14, which further predicted decreased internalizing problems from age 14 (before the pandemic) to age 15 (the initial phase of the pandemic in Spring 2020 in the United States).

Long et al. provided evidence for the importance of social relationships and social-emotional development in adolescents' overall health and wellness through an evaluation study using a randomized controlled trial design. They found that a 15-week school-based universal mental health education intervention aiming to promote students' healthy living such as self-awareness, emotional health, meaning, and social relationships in contexts of

family, peers, and community effectively enhanced self-confidence and life satisfaction among early adolescents (grades 4–6) in the experiment group.

The conceptual article by Rivas and Albertos proposed a novel conceptual framework linking adolescents' experience of optimal frustration that can be facilitated by positive family leisure time and the development of adolescent autonomy. Grounded in Self-Determination Theory and other related theoretical notions such as the theory of flow, the authors argued that although feelings of frustration frequently experienced by adolescents may lead to unfavorable outcomes, it can also provide adolescents with opportunities to learn and practice skills for overcoming adversity, thus fostering resilience and socioemotional wellbeing. The authors also discussed why and in what ways such optimal frustration can be experienced during positive family leisure time. Specifically, through spending quality leisure time together with adolescents, which is characterized by emotional support, communicative interactions, active parental involvement, and positive parental supervision, parents can create a conducive and nurturing family environment where adolescents have opportunities to experience positive frustration while also receiving support, encouragement, guidance, and resources to tackle challenges effectively. To sum up, the authors' conceptual discussion advances our understanding of the role played by parents in adolescent development from a unique perspective and it encourages further research in this area.

All this work with young children and adolescents further reinforces the continuous parental influence on child and adolescent social, emotional, and behavioral development, which may be operated by multiple mediation pathways and interplay with different personal (e.g., adolescents' self-identity) and contextual factors (e.g., school). In addition, these pathways can be utilized in prevention and intervention programs to facilitate children's and adolescents' overall healthy development.

The last article by Matthewson et al. presents findings of a qualitative study on the experiences of voluntary reunification based on interviews with both adult alienated children and targeted parents. Six themes were identified based on sharing from adult alienated children (e.g., factors influencing reunification and the effect of communication) and three themes from narratives provided by the targeted parents (e.g., understanding of reunification and life after reunification). The authors concluded that voluntary reunification is a long-term process that may last for decades and include periods of connection and rejection.

We hope that the studies included in this Research Topic will enable researchers in different fields (e.g., education, psychology, or social work) to exchange both theoretical discussions and empirical practices regarding the relationship between parental factors (e.g., overall familial environment and specific parenting practices) and the child's social and emotional development at different stages (e.g., preschool and adolescence). The Research Topic also delineates different mediation and moderation mechanisms that underlie parental influence on child and adolescent social-emotional adjustment. Findings from all this work provide insights into effective practices for both parenting and youth programs to promote social and emotional functioning among children and adolescents, such as fostering effective emotional socialization and enhancing emotional regulation strategies among children.

It should be noted that interactions between children and parents are bi-directional, meaning they affect each other (Lerner and Castellino, 2002; Zhu and Shek, 2020). Parenting can be parents' active socialization actions that influence their children's development (i.e., parent effect); it can also be parents' reactions to their children's social and emotional functioning (i.e., child effect). Nevertheless, the Research Topic has not included any studies pertinent to the child effect. More effort needs to be devoted to this research area. In addition, only one article (i.e., Lai and Chen) in the Research Topic explores the interplay between family and school factors. Future research should explore factors that may affect child and adolescent social-emotional development in different socialization contexts (e.g., family, school, and culture) simultaneously.

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XZ: Writing – review & editing, Writing – original draft. DD: Writing – review & editing. TK: Writing – review & editing.

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Conflict of interest

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The relationship between parental depression and child internalizing and externalizing problems: The roles of parenting stress and child maltreatment

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Introduction: Although the relationships between parental mental health and child internalizing and externalizing problems have been explored by previous studies, the pathways between these two variables need further exploration. The present study aims to explore the relationships between parental depression and child internalizing and externalizing problems and to examine the roles of parenting stress and child maltreatment in those relationships within the Chinese cultural context.

Method: Data were collected from 855 Chinese families with preschool-aged children, and mediation analysis was used to examine the pathways between these variables.

Results: The results show that parental depression is positively associated with child internalizing and externalizing problems, and child maltreatment and the combination of parenting stress and child maltreatment mediated the relationships between parental depression and child internalizing and externalizing problems, respectively. These findings suggest that parental depression not only has a direct effect on child internalizing and externalizing problems but also has an indirect effect *via* parenting stress and child maltreatment.

Discussion: Decreasing the levels of parenting stress and child maltreatment should be applied in interventions to break the relationships between parental depression and child internalizing and externalizing problems within the Chinese cultural context.

KEYWORDS

parental depression, child behavior problems, parenting stress, child maltreatment, Chinese samples

Introduction

Internalizing and externalizing problems, including maladaptation in emotions and behaviors, are important issues in child development, particularly in children of preschool age (1), but they also have long-term effects on later behavioral, emotional, and social development (2, 3). Approximately 20% of Chinese preschool-aged children have internalizing and externalizing problems (4), and several factors increase the risk of these problems, such as parental depression (5). Parents with high levels of depression may increase the levels of internalizing and externalizing problems in children (6). However, there is little knowledge about the pathways between these two variables. Parents who have high levels of depression may pay attention to negative events (7), which may increase their parenting stress, and these high levels of parenting stress may increase the risk of child maltreatment (8), which, in turn, contributes to child internalizing and externalizing problems (9). According to Goodman and Gotlib (10), the context, particularly the stressors, of the lives of children in families with depressed mothers, contributes significantly to the development of psychopathology in children. Guided by this notion and by the family system theory that emphasizes that the family is

a complex emotional unit and family members influence each other (11), the current study attempts to verify the relationships between parental depression and child internalizing and externalizing problems and to examine the mediating factors (e.g., parenting stress and child maltreatment) of those relationships.

Parental depression, internalizing and externalizing problems, and parenting stress

A growing body of research has shown that parental depression is positively associated with children internalizing and externalizing problems. Based on a cross-sectional study with 2222 Chinese parents, Ma et al. (12) reported that parental depression was positively associated with internalizing and externalizing problems of preschool-aged children. Zong et al. (13) confirmed these results based on a longitudinal study with Chinese samples. Moreover, Marçal (14) found that parental depression positively predicted child internalizing and externalizing problems based on a longitudinal study with Western samples. Parents with depression may have high levels of marital conflicts (15) and hostile parenting methods (16), contributing to high levels of child internalizing and externalizing problems (17). Additionally, according to the model of relationships between depressed mothers and child development discussed by Goodman and Gotlib (10), depressed parents may cause impairments in their child's later development.

Although large extensive research has confirmed the relationships between parental depression and internalizing and externalizing problems in children across nations and cultures, the pathways between these two variables still need further exploration. Parenting stress, an index for levels of stress in parenthood, might be a factor in the relationships between parental depression and child internalizing and externalizing problems. Parents with high levels of depression may have high levels of parenting stress, namely in new parents (18, 19), and Galbally et al. (20) confirmed these results in a longitudinal study with 246 Australian parents of toddlers. Meanwhile, Salloum et al. (21) reported on these relationships among parents of children aged 8–12 years old. Those relationships have also been confirmed in parents of adolescents with Attention-Deficit-Hyperactivity Disorder (22).

Moreover, parenting stress predicts if a child will later develop internalizing and externalizing problems, as seen in previous studies (23, 24). For example, based on a Chinese cross-sectional study, Li et al. (25) reported that parenting stress was positively associated with internalizing and externalizing problems of 317 preschool-aged children. Based on a longitudinal study, Han amd Lee (26) found that parenting stress positively predicted 1724 Korean preschool-aged children's internalizing and externalizing problems. Meanwhile, also based on a longitudinal study, Kochanova et al. (27) found these relationships in 1209 American children in early childhood, and de Maat et al. (28) also confirmed those relationships based on a study conducted with 441 European adolescents and their parents.

Even though the associations between parental depression, child internalizing and externalizing problems, and parenting stress have been explored by extensive research, few studies have explored the roles of parenting stress in the relationships between parental depression and child internalizing and externalizing problems, particularly in children of preschool age. Parents with high levels of depression may have attention biases to negative information (29), which may increase parenting stress (30), and, finally, contribute to child internalizing and externalizing problems (31). Thus, we hypothesize that parenting stress mediates the relationships between parental depression and child internalizing and externalizing problems within the Chinese cultural context.

Parental depression, internalizing and externalizing problems, and child maltreatment

Child maltreatment, including negative parenting behaviors, has been explored in extensive studies, and parental depression may be a risk factor for child maltreatment (32). David (33) found that 62% of parents who have maltreated their children had mental health problems (e.g., depression). Based on a longitudinal study with 1,813 families, Mustillo et al. (34) reported that parental depression positively predicted child maltreatment in children aged 0 to 14. Plant et al. (35) found that parental depression alone did not predict child maltreatment, but the combination of parental childhood maltreatment and depression predicted child maltreatment.

Moreover, the relationships between child maltreatment and child internalizing and externalizing problems have been explored by previous studies. Based on a longitudinal study, Isumi et al. (36) found that child maltreatment positively predicted later internalizing and externalizing problems in Japanese children aged 6 to 10. Watters et al. (37) reported that, based on a longitudinal study, child maltreatment positively predicted later internalizing and externalizing problems in 1067 American adolescents. Ma et al. (38) confirmed these results in a study with 2180 South Korean adolescents. However, Godinet et al. (39) did not find a relationship between child maltreatment and internalizing and externalizing problems among preadolescent girls.

Although associations between parental depression, child internalizing and externalizing problems, and child maltreatment have been explored by extensive research, few studies have explored the role of child maltreatment in the relationships between parental depression and child internalizing and externalizing problems. Moreover, depressed parents may cause negative attributions in child behaviors (12), which may increase the risk of negative parenting behaviors, such as maltreatment behaviors. Thus, we hypothesize that child maltreatment mediates the relationships between parental depression and child internalizing and externalizing problems within the Chinese cultural context.

Parenting stress and child maltreatment

Parenting stress may be a risk factor for child maltreatment (40), and the relationship between these two variables has been explored by

Abbreviations: PANDA, The project of ability and nurture in dreaming age; RMB, Chinese currency; CES-D, Center for Epidemiologic Studies Depression Scale; PSI-SF, Parenting Stress Index-Short Form; ICAST-P, ISPCAN Child Abuse Screening Tools Parent's Version; SDQ, Strengths and Difficulties Questionnaire; DE, Parental depression; PS, Parenting stress; ICAST, Child maltreatment; IEP, Internalizing and externalizing problems.

previous studies. For example, Crouch et al. (41) found that parents who have high levels of parenting stress had three times the risk of maltreating their children than parents with low levels of parenting stress. Maguire-Jack and Negash (42) reported that parenting stress positively predicted child maltreatment in 1045 American families.

Although previous studies have explored the separate roles of parenting stress and child maltreatment in the relationship between parental characteristics and child development, few studies have examined the roles of the combination of parenting stress and child maltreatment in those relationships. We hypothesize that parenting stress and child maltreatment progressively mediate the relationships between parental depression and child internalizing and externalizing problems.

The current study

Although previous studies have explored the relationships between parental depression and child internalizing and externalizing problems, few studies have examined the roles of parenting stress and child maltreatment in those relationships, particularly in Chinese families with preschool-aged children. China, an ancient Eastern country, has a long history of endorsing Confucian culture, which may influence the values, thinking patterns, and beliefs of the modern Chinese population. Traditional Chinese culture emphasizes the importance of children in families [e.g., Wang Zi Cheng Long highlighted the hope within families that children have a bright future) and harsh discipline for educating children (e.g., physical punishment; (43)], which may increase parenting stress and negative parenting behaviors. Thus, parenting within the Chinese cultural context may be different from Western countries, which may raise the importance of exploring these issues within the Chinese cultural context. Moreover, environmental factors (e.g., COVID-19) may also influence parental mental health, which may increase the risks of parenting stress and child maltreatment, and contribute to maladaptation in child development. Therefore, the current study attempts to verify the relationships between parental depression and child internalizing and externalizing problems and to examine the roles of parenting stress and child maltreatment in Chinese families with preschool-aged children. We hypothesize that parenting stress and child maltreatment play a mediation role in the relationships between parental depression and child internalizing and externalizing problems, respectively, as well as the combination of parenting stress and child maltreatment (see Figure 1).

Methods

Participants

The project of ability and nurture in dreaming age (PANDA), a Chinese longitudinal study with a six-month interval, aimed to explore the relationships between external environment factors (e.g., family, school, and community) and individuals' development from preschool to middle school within the Chinese cultural context. The PANDA initially recruited 900 families from five preschools in South China, and 45 families dropped out during the data collection process. The current study used the data of Wave 1 in PANDA, which was collected in May 2021. In 855 families, 15.8% (135/855) of fathers completed the survey, and all of the parents had married within five years of the survey date (3 years: 11.5%; 4 years: 29.9%; 5 years: 58.6%). For family monthly income, 0.8% of the families were below 2500RMB ($368.25), 2.5% fell into the range from 2500RMB to 5000RMB ($736.5), 12.9% fell into the range from 5001RMB to 10,000RMB ($1,473), 56.1% fell into the range from 10,001RMB to 30,000RMB ($4,419), and 27.6% of the families earned above 30,000RMB (the median income in the geographical area of the study was 8,832 RMB). Moreover, the mean children's age was 4.55 years (SD = 0.85), with a range from 3 to 6 years, and 52.2% (446/855) of the children were boys.

Measures

The Center for Epidemiologic Studies Depression Scale (CES-D) is a self-report scale with 20 items that was developed by Radloff (44) with the aim of assessing levels of depression in daily life. Each item is rated on a four-point Likert scale ranging from "1 = *rarely or <1 day*" to "4 = *most of the time*," and high scores indicate high levels of depressive symptoms. Wang et al. (45) translated and validated the CES-D to the Chinese cultural context, and the Chinese version of the CES-D has been widely used to assess depression in Chinese samples (46). The Chinese version of the CES-D was administered to assess parental depression in the current study, and had a Cronbach's alpha of 0.88.

The Parenting Stress Index-Short Form (PSI-SF) is a self-report questionnaire with 36 items that was developed by Abidin (47) with the aim of measuring levels of parenting stress. The PSI-SF has three subscales, including parenting distress (e.g., *feel alone and without friends*), dysfunctional interaction (e.g., *most times feel that child does not like me*), and difficult child (e.g., *my child generally wakes up in a bad mood*), which measure different aspects of parenting stress. Each item is rated based on a five-point Likert scale ranging from "1 = *strongly disagree*" to "5 = *strongly agree*," with higher scores indicating high levels of parenting stress. The Chinese version of the PSI-SF has good reliability and validity (48), and it was administered in the current study with a Cronbach's alpha of 0.94.

The ISPCAN Child Abuse Screening Tools Parents Version (ICAST-P) is a self-report screening tool developed by Runyan et al. (49) that has been used to measure child maltreatment across nations and cultures (50). Chen et al. (51) translated and validated the ICAST-P to the Chinese cultural context, and the Chinese version of the ICAST-P has 40 items and acceptable reliability and validity. The Chinese version of the ICAST-P has 5 subscales, including moderate physical discipline (12 items; e.g., *Shook him/her aggressively*), severe physical discipline (5 items; e.g., *Burned him/her*), emotional discipline (12 items; e.g., *Shouted at him/her*), neglect (5 items; e.g., *Your child was not given food to eat*), and non-violent discipline (6 items; e.g., *Explained to him/her why something s/he did was wrong*). Participants respond to each item *via* a six-point scale (0 = *never and not in the past year*; 1 = *once or twice a year*; 2 = *several times a year*; 3 = *about once a month*; 4 = *several times a month*; and 5 = *once a week or more often*), and high scores indicate high levels of child maltreatment. The Chinese version of the ICAST-P was administered in the current

FIGURE 1
Hypotheses models. **(A)** model: Parenting stress model; **(B)** model: Child maltreatment model; **(C)** model: The combination of parenting stress and child maltreatment model.

study to measure child maltreatment, and had a Cronbach's alpha of 0.90.

The Strengths and Difficulties Questionnaire (SDQ) is a self-report questionnaire with 25 items that was developed by Goodman (52) with the aim of measuring the mental strengths manifested in children and the difficulties faced by the children. It has five subscales, including subscales of emotional symptoms (e.g., *Many worries, often seems worried*), conduct problems (e.g., *Often lies or cheats*), hyperactivity (e.g., *Thinking things out before acting*), peer problems (e.g., *Rather solitary, tends to play alone*), and prosocial scale (e.g., *Kind to younger children*). Participants respond to each item *via* a three-point scale (1 = "not true," 2 = "somewhat true," and 3 = "certainly true"), and high scores indicate high levels of mental strengths and difficulties. The Chinese version of the SDQ has good reliability and validity (53, 54), and subscales of emotional symptoms, conduct problems, hyperactivity, and peer problems were administered to measure internalizing and externalizing problems of children in the current study, and the Cronbach's alpha of the total four subscales was 0.71.

Procedure

The authors presented the aims and processes of this study to five preschool headmasters and received their permission to conduct the current study in their preschools. A total of 855 parents from different families signed the informed consent at the beginning of the data collection process and finished the questionnaire booklets within 15 min in the classrooms. Teachers and parents who participated in the study received a small gift ($1), and parents also later received feedback that delineated the current development situation of their child. Concerning the feedback, it did not contain variables of this study, which may not affect the results of this study. The study was approved by the ethics committee of the author's institution, and the procedures and measures of the current study were safe for participants.

Data analysis

The current study used several steps to perform the data analysis. First, the author cleaned and prepared the data. For example, the author cleaned the data by removing the outliers (25/900) who completed the questionnaires with the same answer except for the demographic questionnaires, and participants (20/900) who finished the questionnaire in <350 seconds and provided wrong answers for all detecting questions (e.g., please choose "3"). Then normality was examined, and the average scores were computed for each scale, and prepared for the next steps.

Second, the Pearson correlation was conducted to analyze the correlations between variables, and also to examine whether the mediation analysis was suitable for further analysis or not. The data is considered suitable for mediation analysis if the coefficients of pairwise correlations are significant among study variables (55).

Third, mediation analysis is a method to explore the roles of one or more than one variable in relationships between other two variables, which may explain the pathways or mechanisms underlying variables. The current study used mediation analysis to explore the relationships between parenting depression, child

TABLE 1 Means, standard deviations, and correlations between study variables ($n = 855$).

Variables	M	SD	1	2	3	4
1 DE	1.45	0.51	–			
2 PS	2.24	0.68	0.34**	–		
3 ICAST	1.41	0.85	0.14**	0.20**	–	
4 IEP	1.50	0.47	0.14**	0.14**	0.10**	–

*DE, Parental depression; PS, Parenting stress; ICAST, Child maltreatment; IEP, Internalizing and externalizing problems. **$p < 0.01$.*

internalizing and externalizing problems, parenting stress, and child maltreatment. A direct model was conducted to delineate the relationships between parental depression and child internalizing and externalizing problems, then a serial mediation model was conducted to delineate the roles of parenting stress and child maltreatment in the relationships between parental depression and child internalizing and externalizing problems. All statistical analyses were conducted by R language version 4.1.2 with bruceR packages. A PROCESS (model 6) function with maximum likelihood estimation was used to explore the serial mediation model. Moreover, the Bias-corrected percentile bootstrap method was used to examine the 95% confidence interval (CI) of mediation effects of 1,000 samples. If the 95% CI of the indirect effect contains 0 it means that the indirect effect exists, and if the 95% of the direct effect contains 0 it means that the variable plays a full mediation role in the study variables. All tests were two-tailed for significance, and the p-value was set at 0.05. Additionally, the current study used digital questionnaires to collect data, and there were no missing data for all variables.

Results

Descriptive statistics

The results of descriptive statistics and correlations between study variables are presented in Table 1. As indicated, parental depression was positively associated with child maltreatment ($r = 0.14$, $p < 0.01$), parenting stress ($r = 0.34$, $p < 0.01$), and internalizing and externalizing problems in children ($r = 0.14$, $p < 0.01$). Parenting stress was positively associated with child maltreatment ($r = 0.20$, $p < 0.01$) and internalizing and externalizing problems in children ($r = 0.14$, $p < 0.01$).

The relationships between parental depression and child internalizing and externalizing problems

The results of the regression analysis are presented in Table 2. The results showed that parental depression was positively associated with child internalizing and externalizing problems ($\beta = 0.127$, S.E.$= 0.031$, $R^2 = 0.035$, and $p < 0.001$), with controlling children's genders and ages, the number of children in the family, and family monthly income.

Mediation analysis

The results of the mediation analysis are presented in Table 3 and Figure 2. The results showed that parental depression was positively associated with parenting stress ($\beta = 0.441$, S.E.$= 0.043$, $R^2 = 0.156$, and $p < 0.001$) when controlling children's genders and ages, the number of children in the family, and family monthly income. In the model of CES-D-PS-ICAST, parental depression was positively associated with child maltreatment ($\beta = 0.131$, S.E.$= 0.060$, $R^2 = 0.050$, and $p < 0.05$), and parenting stress was positively associated with child maltreatment ($\beta = 0.241$, S.E.$= 0.045$, $R^2 = 0.050$, and $p < 0.001$). In the model of CES-D-PS-ICAST-IEP, parental depression was positively associated with child internalizing and externalizing problems ($\beta = 0.098$, S.E.$= 0.033$, and $p < 0.01$) when controlling children's genders and ages, the number of children in the family, and family monthly income. Moreover, the results of the Bias-corrected percentile method showed that the 95% CI of indirect effects of parenting stress and child maltreatment were [−0.058, 0.043] and [0.000, 0.019], respectively, and the 95% CI of direct effect was [0.030, 0.160], which suggested that child maltreatment mediated the relationships between parental depression and children's internalizing and externalizing problems. Additionally, the results of the Bias-corrected percentile method showed that the 95% CI of all indirect effects of the combination of parenting stress and child maltreatment was [0.000, 0.160], which suggested that parenting stress and child maltreatment mediated the relationships between parental depression and child internalizing and externalizing problems. Additionally, a moderation analysis was also performed, and the results showed that there were no gender effects.

Discussion

The present study explored the relationships between parental depression and child internalizing and externalizing problems and examined the roles of parenting stress and child maltreatment in those relationships within the Chinese cultural context. As such, it broadens the scopes of childhood and family studies. These findings suggested that parental depression was positively associated with child internalizing and externalizing problems, and child maltreatment and the combination of parenting stress and child maltreatment mediated the relationships between parental depression and child internalizing and externalizing problems, respectively.

The results showed that parental depression was positively associated with parenting stress, which was consistent with previous studies (56). Individuals with depression may have less self-efficacy (57), which may contribute to high levels of parenting stress. The results also showed that parental depression was positively associated with child maltreatment, which was consistent with previous studies (58, 59). Similarly, according to the family system theory, depressed parents may impair child development by causing internalizing and externalizing problems in their children. Meanwhile, parenting stress was positively associated with child maltreatment, which was consistent with previous studies (41). These findings suggest that parental depression may be an important factor in child development.

Moreover, the results showed that child maltreatment mediated the relationships between parental depression and child internalizing and externalizing problems, which indicated that parental depression

TABLE 2 The regression between parental depression, parenting stress, child maltreatment, and internalizing and externalizing problems ($n = 855$).

	IEP	PS	ICAST	IEP
Intercept	1.500 (0.016)***	2.235 (0.022)***	0.9291 (0.105)***	1.500 (0.016)***
Child gender	0.010 (0.032)	0.040 (0.043)	−0.103 (0.057)	0.012 (0.032)
Number of children	0.049 (0.034)	0.025 (0.046)	0.064 (0.061)	0.045 (0.034)
Child age	−0.003 (0.019)	0.038 (0.026)	−0.016 (0.034)	−0.004 (0.019)
Income	−0.062 (0.021)**	−0.170 (0.028)***	0.018 (0.038)	−0.054 (0.021)
DE	0.127 (0.031)***	0.441 (0.043)***	0.131 (0.060)*	0.098 (0.033)**
PS			0.214 (0.045)***	0.047 (0.025)
ICAST				0.037 (0.019)
R^2	0.035	0.156	0.050	0.044
Adjust R^2	0.029	0.151	0.043	0.036

*DE, Parental depression; PS, Parenting stress; ICAST, Child maltreatment; IEP, Internalizing and externalizing problems; *$p < 0.05$; **$p < 0.01$; ***$p < 0.001$.*

TABLE 3 The indirect paths between parental depression and internalizing and externalizing problems through parenting stress and child maltreatment ($n = 855$).

	Estimate	S.E.	Z	*P*	[Boot 95% CI]	β
Indirect_All	0.029	0.012	2.408	<0.016*	[0.005, 0.051]	0.031
Ind_X_M1_Y	0.021	0.012	1.700	<0.089	[−0.058, 0.043]	0.022
Ind_X_M2_Y	0.005	0.004	1.146	0.252	[0.000, 0.019]	0.005
Ind_X_M1_M2_Y	0.003	0.002	1.557	0.119	[0.000, 0.009]	0.004
Direct	0.098	0.034	2.889	0.004**	[0.030, 0.160]	0.106
Total	0.127	0.031	4.069	<0.001***	[0.065, 0.184]	0.137

*X, parental depression; Y, internalizing and externalizing problems; M1, parenting stress; M2, child maltreatment; *$p < 0.05$; **$p < 0.01$; ***$p < 0.001$.*

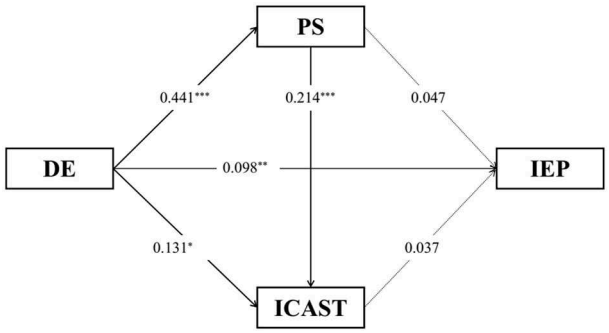

FIGURE 2
The mediation model between parental depression and children's internalizing and externalizing problems through parenting stress and child maltreatment.

not only had a direct effect on child internalizing and externalizing problems but also had an indirect effect *via* child maltreatment. Individuals with high levels of depression may have disorganized interactions with children, and these disorganized interactions may be considered as some kind of child maltreatment, contributing to child internalizing and externalizing problems (60). Depressed parents may reject their children, which may increase child internalizing and externalizing problems (61). These findings suggest that child maltreatment may be one of the bridges between parental depression and child internalizing and externalizing problems.

Additionally, the results showed that parenting stress and child maltreatment progressively mediated the relationships between parental depression and child internalizing and externalizing problems, which suggested that parental depression influenced child internalizing and externalizing problems *via* the combination of parenting stress and child maltreatment. Individuals with depression may have low levels of self-efficacy (57) and attention biases in negative information (29), which may contribute to high levels of parenting stress, and these high levels of parenting stress may increase the risk of child maltreatment, which, in turn, contributes to high levels of child internalizing and externalizing problems. The results confirm the assumptions offered by the model of depressed mothers and maladaptation of children and those proposed by the family system theory, and raises the importance of exploring parental depression. These findings suggest that parental depression influences how parents treat their children (e.g., parenting stress and child maltreatment) and that it can lead to child internalizing and externalizing problems.

Some conclusions can be reached with the results of the current study. First, parental mental health is an important issue for children and families, and may increase the risk of parenting stress, child maltreatment, and child internalizing and externalizing problems. Governments and communities should invest in some programs that aim to improve the mental health of parents, and provide some strategies for preserving positive mental health. Second, parenting stress and child maltreatment are two mediators in the relationships between parental depression and child internalizing and externalizing problems, and decreasing

parenting stress and child maltreatment may reduce the influence of parental depression on child internalizing and externalizing problems. Governments and communities should support parents with materials and mental health support through some programs, which may decrease parenting stress. Parents should learn some positive strategies for educating children, which may decrease the risk of child maltreatment.

Some limitations should be acknowledged in the current study. First, the present study contained few male participants who were parents, which may affect the data on parental depression. Future studies should recruit couples for the study, which may give much more solid evidence on parental depression and parenting stress. Second, the current study used cross-sectional designs to examine the pathways between parental depression and child internalizing and externalizing problems, which may not verify a causal relationship. Future studies should apply longitudinal designs to examine the mechanisms linking parental depression and child internalizing and externalizing problems. Third, the current study used self-report questionnaires to collect the data, which may lead to results that incorporated memory bias and social desirability. Future studies should collect data with different methods (e.g., interviews, questionnaires, and experiments), which may provide much more accurate information.

Conclusion

The present study explored the relationships between parental depression and child internalizing and externalizing problems, and examined the roles of parenting stress and child maltreatment in those relationships within the Chinese cultural context. In doing so, it broadens the scopes of family studies. The findings suggested that parental depression was positively associated with child internalizing and externalizing problems, and child maltreatment and that the combination of parenting stress and child maltreatment mediated the relationships between parental depression and child internalizing and externalizing problems, respectively. Parental depression not only had a direct effect on child internalizing and externalizing problems but also had an indirect effect *via* parenting stress and child maltreatment. Decreasing the levels of parenting stress and child maltreatment should be applied in interventions to break the relationships between parental depression and child internalizing and externalizing problems in the Chinese cultural context.

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 author.

Ethics statement

The studies involving human participants were reviewed and approved by Beijing Normal University. The patients/participants provided their online informed consent to participate in this study.

Author contributions

CC designed the study, written and revised the manuscript, and completed the data analysis.

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Conflict of interest

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

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Supplementary material

The Supplementary Material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/fpubh.2023.962951/full#supplementary-material

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Accompanying your children: Living without parents at different stages of pre-adulthood and individual physical and mental health in adulthood

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Objectives: This study examined how living without parents at different stages of childhood and adolescence affects physical and mental health in adulthood.

Methods: The data came from 3,464 survey respondents aged 18–36 in the 2018 China Labor-Force Dynamics Survey. Physical health was self-rated. Mental health was measured by the Center for Epidemiological Studies Depression scale. The ordered probit and ordinary least-squares regression analyses were employed to determine the associations between growing up without parents at different stages in pre-adulthood and individual physical and mental health in adulthood.

Results: Individuals who did not live with their parents during their minor years were more likely to report worse physical and mental health in adulthood, compared to those who lived with their parents. This difference was heterogeneous among different age stages and genders.

Conclusions: Absence of parents in the household has long-term impacts on the physical and mental health of children in adulthood, especially for females. The government should make feasible institutional arrangements to avoid the separation of minor children from their parents.

KEYWORDS

left-behind children, physical health, mental health, family structure, parental absence

Introduction

Numerous factors during childhood and adolescence have significant impact on an individual's health in adulthood (1, 2). Current studies mainly focus on how the health of caregivers is impacted by caring for children and adolescents (3), or on the current health of children and adolescents (4–12). Research has not yet highlighted how parental absence at various stages of childhood and adolescence can affect physical and mental health in adulthood.

The situation of minors living without parents is generally due to parental divorce, death, or working away from the home (13–16). Based on the attachment theory (17), parental absence may harm children's physical and social psychological development and lead to negative outcomes eventually (18). As an emotional bond of one person with another person, the behavior of attachment is a necessary psychological need that human beings are born with (19). The early emotional bonds formed by children with their caregivers (mainly parents) have significant impacts on children's cognitive and socioemotional development

throughout life (20–22). The attachment system serves two primary functions by providing instrumental and emotional support (23). One is to protect individuals from potential threats or injuries, and the other is to regulate individual negative emotions following threatening or harmful events (23). Children who maintained proximity to an attachment figure were more likely to receive care, comfort and protection (17). If the attachment is lost or weakened such as parental absence, it may be detrimental to the physical and mental development of children and ultimately affect physical and mental health of children for a long time (17–23).

For the physical health, a study by Schwartz and McLanahan suggested that absence of the father during children's growing years can result in poor physical health outcomes to the children (13). Whereas, the father, as the main provider of income for a family, determines the quality of child care and health care that children receive. The absence of the father may lead to poor care for the child, and may result in insufficient food and nutrition for the child, which may have negative impacts on the child's physical health (13).

For the mental health, the economic hardship of a single-parent household may cause depression and psychological distress in children (13). Compared to non-bereaved children, children who lost a parent to death showed more serious mental illness (14). In the first 2 years following the death of a parent, children experienced increased risk of psychiatric disturbance (15). In a survey of children with multinational family backgrounds, it was found that compared with children living with both parents, children in households where the father was absent due to migrant work in Indonesia, Vietnam, and Thailand had greater odds of experiencing emotional disorders (16).

The absence of parents affects not only the physical and mental health of minors as they are growing up, but also their physical and mental health in adulthood (24–28). From adolescence through early adulthood, individuals from non-intact families are more likely to engage in adverse health-related behaviors including smoking, alcohol consumption, poor nutrition habits, and low physical activity, compared with those who grow up in intact families (24). They also have worse self-reported health and more subjective health complaints. Temporary parental separation very soon after birth can have unfavorable effects on later psychological development, including vulnerability to addiction (25) and a certain degree of depression risk (26). For instance, according to a 28-year cohort research which was consisted of 3,020 subjects in Finland, the 4% of adult respondents who experienced temporary separation at birth had been treated in hospital due to a depressive episode, and the incidence was higher than that of respondents who did not experience temporary separation at birth (26). Parental divorce can negatively affect the mental health of young adults (27). However, experience of parental divorce in childhood may not be an indicator of adult psychiatric or somatic health issues (28). Overall, although prior studies have examined the effects of absence of parents on current health of children or their health in adulthood, a consensus has not been reached.

As the main reason for separation of children from their parents in China is that the parents leave rural areas to go to work in cities, the left-behind children are the main component of the kids who did not spend childhood or adolescent with their parents (29). As of 2020, the number of children left behind in rural China totaled 6.436 million (29). While their parents work in cities, these so-called left-behind children may live with their grandparents, older brothers and sisters, other relatives, or alone. According to China Ministry of Civil Affairs, 96% of these left-behind children aged under 16 years old are lived with their grandparents (30).

Children who are left behind have lower levels of physical and mental health than their peers (31). The adverse effects of lack of parental care and attention tend to accumulate over time (32–34). Left-behind children are shorter than their peers due to insufficient intake of energy, protein, calcium, and other nutrients (32). They may be at higher risk for stunted growth, unhealthy food preferences, lower physical activity, smoking, alcohol consumption, injuries, and incomplete vaccination (32). In addition, they are more prone to negative emotions, social anxiety, and low self-esteem (33, 34). However, on the positive side, children's health and experiences may benefit from the greater income earned by parents working abroad or in cities (35, 36).

On the whole, the parental absence harms more than it benefits the physical and mental health of minor children. Although some studies have shown that the effect of parental absence on children's health is lasting, its effect at different ages on children's physical and mental health in adulthood has not been widely explored. According to developmental psychology, minors have different developmental needs at different age stages (37, 38). Therefore, children's needs on parental accompany in different age stages before adulthood may be heterogeneous (39–42). For example, at the age of 0–6, children may mainly need material care and emotional companionship from their parents (39); for children aged 7–12, the development of living habits needs to be carried out under the supervision of their parents (40, 41); when children are 13–15 years old, they generally enter a rebellious period, and parents need to help them deal with emotional problems in this stage (42). Generally, compared with children whose parents are not absent, children whose parents are absent are less likely to be observed and satisfied with their development needs at different age stages before adulthood. This is more likely to have a negative and lasting impact on children's physical and mental health. Furthermore, as children growing older, they tend to be independent of their parents and the early attachment between children and parents may be gradually weakened (43). Thus, the effect of parental accompany before adulthood on children's health outcomes in adulthood may present a decreasing trend. However, few studies have made attempts to empirically test the effect of parental absence at different age stages on children's health in adulthood.

In this paper, we divided period before individual adulthood into four stages based on Chinese situation-—0–6, 7–12, 13–15, and 16–18 years old. In general, 0–6 years old is a stage of preschool age in China, 7–12 years old is primary education stage, 13–15 years old is a stage of secondary school, and 16–18 years old is high school stage. This age division based on Chinese educational regime appropriately covers all stages of an individual before adulthood (44). It also reflects the physical and mental development characteristics of individuals at different age stages before adulthood to a certain extent.

Moreover, gender is a vital social lens to promote the more careful and targeted child care (45). Compared with boys, girls

are more vulnerable to the inequality of being cared for before adulthood (46). As mentioned above, the vast majority of left-behind children (96%) live with their grandparents in China. These older grandparents are more influenced by the traditional patriarchal ideology than younger parents to a large extent, and they may take less care of female grandchildren than male grandchildren (47, 48). Therefore, the absence of parents may have a greater negative impact on the physical and mental health of girls than boys. However, few studies have made attempts to test the heterogeneous influences of living without both parents during childhood and adolescence on individuals' physical and mental health in adulthood from the perspective of gender difference.

Hence, in this study, we used a nationally representative survey of 3,464 Chinese respondents with an average age of 28 years, and expanded the body of knowledge of this subject by focusing on the long-term effects of living without parents at different age stages before adulthood. We observed how living without parents during the age ranges 0–6, 7–12, 13–15, and 16–18 affected the physical and mental health of individuals in adulthood (Figure 1). In addition, we conducted a heterogeneity analysis based on gender. Our study should be of interest to researchers and public policy makers concerned with the welfare of children and adolescents.

Methods

Data source

Our study used data from the 2018 China Labor-Force Dynamics Survey, a comprehensive study conducted by the Center for Social Science Survey at Sun Yat-sen University to collect information on Chinese education, work, migration, health, economic activities, and other interdisciplinary aspects (49). The major objective of the survey was to provide basic public data for social science research in China. It was designed using a multistage cluster and stratified probability-proportional-to-size sampling strategy, and computer-assisted interviews were conducted in respondents' homes or by telephone. It collected data from 29 provincial administrative units across the country, so it is nationally representative. After cleaning the data by excluding the missing values, outliers, and other abnormal values, we obtained useful samples from 3,464 respondents. Because the data were collected by professionals at the university, its validity is assured.

Participants

Among the analysis samples of this paper, males represented 45.4% of the total participants. The age of the participants ranged from 18 to 36 years, with a mean value of 28.225 (SD = 5.206). The average years of school were 11.523 (SD = 3.913), between junior high school and senior high school. The logarithm of total annual income of the participants in 2017 had a mean value of 10.533 (SD = 0.878), with a minimum value of 5.704 and a maximum value of 14.914. A total of 70.2% of the participants were married, 21.8% had the habit of smoking, 16.9% drank alcohol, and 36.4% exercised regularly.

Measures

Explained variables

Physical and mental health were the two explained variables in our analysis. Physical health status was self-rated (50–53). Respondents were asked "How would you evaluate your current health status?" and could rate their responses from 1 to 5 on a five-point Likert scale that included "very unhealthy," "somewhat unhealthy," "normal," "somewhat healthy," and "very healthy."

The Center for Epidemiological Studies Depression (CES-D) scale developed by Radloff was employed to assess the mental health of respondents (54, 55). The CES-D is one of the most widely used scales for measuring depression and mental health (56, 57). It has been verified as valid for the assessment of depression and mental health status in a Chinese context (58–62). The CES-D scale is scored from 20 to 80, and a higher score indicates a higher level of depression and worse mental health (54). The Cronbach's alpha on CES-D scale is 0.949 in this study.

Explanatory variables

The explanatory variables represented who the individual lived with at specific age ranges while growing up. Respondents were asked to recall, "Who did you live with when you were 0–6 / 7–12 / 13–15 / 16–18 years old?" If a child was living with both parents during a specific age range, the response was assigned a value of 0; other responses received a value of 1.

Control variables

To adjust for potential confounding effects on associations between living without parents at different stages and individual physical and mental health in adulthood (63–66), we used several control factors in our regression model analyses. The variables used were gender (male = 1, female = 0); age in years; number of years of schooling; marital status (married = 1, unmarried = 0); logarithm of the total annual income of the respondent in 2017; smoking (habitual smoking = 1, otherwise = 0); drinking (habitual drinking = 1, otherwise = 0); and exercise (habitual exercise = 1, otherwise = 0). In addition, we controlled for regional effect based on the provinces where respondents were located.

Analysis strategy

Descriptive statistics were computed to estimate the proportion of respondents living with and without parents at each age range, the current physical and mental health status, and the demographic characteristics of the respondents. In models for different age ranges of living without parents, multivariable analyses adjusted for the confounding effects of general factors affecting individual health in adulthood (67). We used ordered probit regression models to analyze the effects of living without both parents at different stages on the physical health of individuals in adulthood. The main equations for this specification can be written as follows (68):

$$physical\ health_i^* = \beta' x_i + \varepsilon_i \quad (1)$$

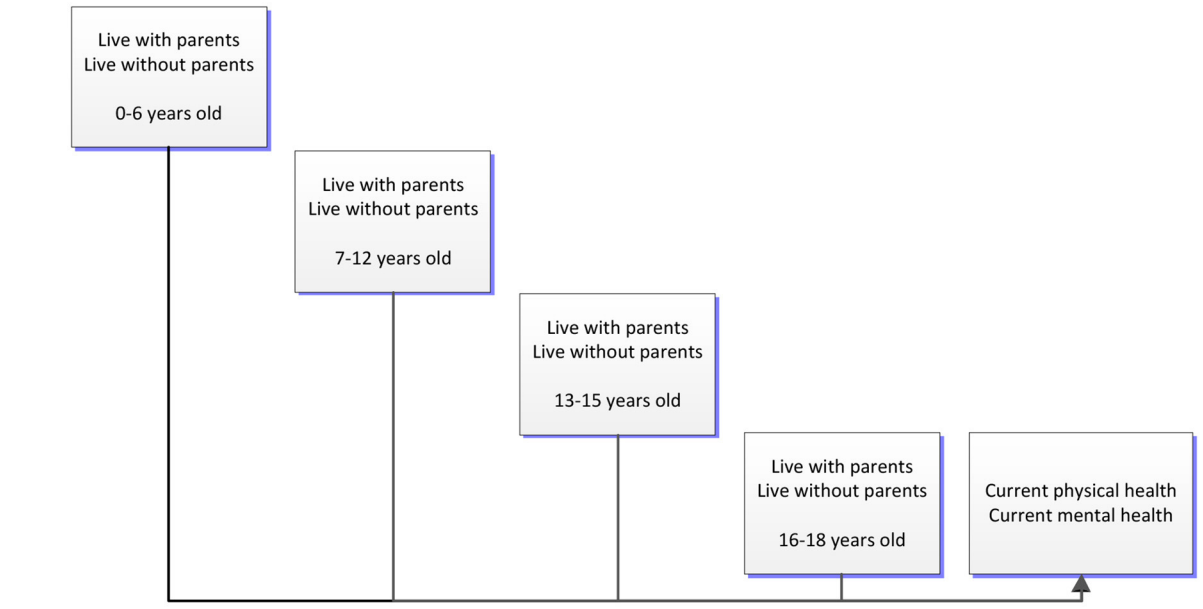

FIGURE 1
Study framework.

where i denotes an individual observation, $physical\ health_i^*$ represents the unobserved dependent variable, viz., individual's physical health, x_i represents a vector of explanatory variable, β' represents a set of parameters, and ε_i is a random error term which is followed normal distribution. In general, $physical\ health_i^*$ cannot be observed directly, but the categorical variable $physical\ health_i$ can be observed. The relationship between $physical\ health_i^*$ and $physical\ health_i$ can be represented as follows:

$$\begin{aligned} physical\ health_i &= 1 \qquad if\, 0 \le physical\ health_i^* \le \mu_1 \\ physical\ health_i &= 2 \qquad if\, \mu_1 \le physical\ health_i^* \le \mu_2 \\ &\vdots \\ physical\ health_i &= M \qquad if\, \mu_{M-1} \le physical\ health_i^* \end{aligned} \tag{2}$$

where μ are the cut points, which are the unknown parameters to be estimated along with β', and M are the possible outcomes for $physical\ health_i$. In this study, M ranges from "1" to "5."

To estimate the effects on individual mental health in adulthood, we used ordinary least-squares regression models. The specific ordinary least-squares model is as follows:

$$mental\ health_i = \alpha_0 + \alpha_1 x_i + \alpha_2 X + \varepsilon_i \tag{3}$$

where $mental\ health_i$ represents the explained variable of mental health which is measured by the CES-D scale, and x_i means the explanatory variable. α_0 denotes the intercept item, α_1 and α_2 are coefficients for explanatory variable and control variables, respectively. X means a set of control variables, and ε_i is the random error item.

Furthermore, there may be some observable systematic differences among individuals, and it is the respondents' family self-selection to live with parents or not. If we compared the two groups of respondents directly, the estimation results may be biased due to the self-selection of samples. Thus, to confirm the influences of living without parents at various stages of childhood on individual physical and mental health in adulthood, the propensity score matching (PSM) method was used to build a counterfactual framework. The main equations of PSM model can be written as follows (69):

$$\begin{aligned} ATT_p &= E\left[\left(physical\ health_{1i} - physical\ health_{0i}\right) | AS_i = 1\right] \\ &= E\left\{E\left[\left(physical\ health_{1i} - physical\ health_{0i}\right) | AS_i = 1\right], \right. \\ &\quad \left. p(Z_i)\right\} \\ &= E\left\{E\left[physical\ health_{1i} | AS_i = 1\right],\ p(Z_i)\right. \\ &\quad \left. - E\left[physical\ health_{0i} | AS_i = 0, p(Z_i)\right] | AS_i = 1\right\} \end{aligned} \tag{4}$$

$$\begin{aligned} ATT_m &= E\left[\left(mental\ health_{1i} - mental\ health_{0i}\right) | AS_i = 1\right] \\ &= E\left\{E\left[\left(mental\ health_{1i} - mental\ health_{0i}\right) | AS_i = 1\right], \right. \\ &\quad \left. p(Z_i)\right\} \\ &= E\left\{E\left[mental\ health_{1i} | AS_i = 1\right],\ p(Z_i)\right. \\ &\quad \left. - E\left[mental\ health_{0i} | AS_i = 0, p(Z_i)\right] | AS_i = 1\right\} \end{aligned} \tag{5}$$

Where ATT_p and ATT_m are the average effect of treatment on the treated. $physical\ health_i$ and $mental\ health_i$ are the explained variables, AS_i denotes a binary treatment variable, specifically, taking a value of "1" for respondents who lived without both parents at 0–6 / 7–12 / 13–15 / 16–18 years old; otherwise, $AS_i = 0$. $p(Z_i)$ represents the propensity scores estimated by PSM estimation, and Z_i represents a set of covariates.

Results

Descriptive statistics

Table 1 reports the definitions of the variables employed in this study and the results of the descriptive analysis (n = 3,464). Of the explained variables, the average value for respondents' physical health was 3.995 (SD = 0.820) on the five-point Likert scale ranging from 1 to 5, which means the physical health of the respondents was generally between "normal" and "somewhat healthy." The average value for mental health of respondents was 26.858 (SD = 8.217) on the CES-D scale ranging from 20 to 80.

The explanatory variables, either living with parents (represented by a value of 0) or without parents (represented by a value of 1) before adulthood, were stratified into four different age stages. Of the total respondents, 9.6% lived without their parents during the ages of 0–6, 10.4% during the ages of 7–12, 14% during the ages of 13–15, and 21.9% during the ages of 16–18.

Benchmark regression

Table 2 reports the ordered probit model and the ordinary least-squares model results. It can be observed from Table 2 that compared to individuals who lived with their parents, individuals who did not live with their parents during the ages of 0–6 had significantly worse physical health in adulthood (coefficient = −0.223, $p < 0.01$). A similar situation also occurred in the age ranges 7–12 (coefficient = −0.169, $p < 0.01$), and 13–15 (coefficient = −0.099, $p < 0.1$). However, there were no significant difference in the effects of living with and without parents at the ages of 16–18 on the physical health of individuals in adulthood.

Similarly, compared with individuals who lived with their parents, individuals who did not live with their parents during the ages of 0–6 had significantly worse mental health in adulthood (coefficient = 2.632, $p < 0.01$). A similar situation occurred during the ages of 7–12 (coefficient = 2.178, $p < 0.01$), 13–15 (coefficient = 1.355, $p < 0.01$), and 16–18 (coefficient = 0.696, $p < 0.05$).

Sub-group regression by gender

Owing to the gender heterogeneity of our survey sample, we further explored the influence of living without parents at different age stages from the perspective of gender difference. Tables 3, 4 report the effects, separately for adult males and females.

Table 3 shows that the effect on adult physical health of living without parents during the age range 0–6 was statistically significant and negative for both males (coefficient = −0.161, $p < 0.1$) and females (coefficient = −0.285, $p < 0.01$). It suggests that compared with individuals who lived with their parents, both males and females who did not live with their parents during ages 0–6 had significantly worse physical health in adulthood. However, for the age range 7–12, living without parents had a significant and negative influence on physical health of females (coefficient = −0.217, $p < 0.01$) in adulthood, but not on that of males. Furthermore, for the age range 13–18, living without parents had no significant effect on the physical health of males nor females in adulthood. The results indicate that, in terms of long-term physical health outcomes, children need parents more in their early years than when they are older, and that females need the presence of parents for longer than males during their minor years.

In terms of mental health, columns 1, 3, and 5 of Table 4 show that, before the age of 15, living without parents had a significant negative effect on males' mental health in adulthood. Males who did not live with their parents before the age of 15 had greater stress and worse mental health in adulthood than those who lived with their parents before the age of 15. This effect became statistically insignificant in the age 16–18 range, as shown in column (7). For females, it can be seen from columns 2, 4, 6, and 8 of Table 4 that, for all pre-adulthood age ranges (0–18 years), living without parents had a significant negative influence on mental health in adulthood. Compared with females who lived with their parents, females who did not live with their parents at all age stages of pre-adulthood had greater stress and worse mental health in adulthood.

From the influential coefficient, Tables 3, 4 show that, at each age stage, living without parents before adulthood had a greater negative effect on physical and mental health for females in adulthood than for males.

In terms of age distribution, the 0–6 age range was the only one showing a significant negative effect on the physical health of males in adulthood; after the age of 6, the effect was no longer significant. For females, living without their parents had a significant negative effect on their physical health in adulthood until the age of 12; after the age of 12, the effect became statistically insignificant. In terms of mental health, living without parents had a significant negative effect on males in adulthood until the age of 15; after the age of 15, this effect became statistically insignificant. However, during all pre-adulthood age ranges (0–18), living without parents had a significant negative effect on females' mental health in adulthood.

Dealing with self-selection bias

Table 5 shows the effects of living without parents at the ages of 0–6, 7–12, 13–15, and 16–18 on individual physical and mental health in adulthood by adopting four types of matching methods: nearest-neighbor matching with caliper matching, radius matching, kernel matching, and local-linear regression matching.

In the PSM analysis, the values of the average treatment effect on treatment (ATT) in the different matching methods were all significant. The results indicate that, after eliminating observable systematic differences, living without parents at the ages of 0–6, 7–12, 13–15, and 16–18 still had significant and negative effects on individual physical and mental health in adulthood. Thus, the PSM analysis showed that the results of this study are robust.

Discussion

The Convention on the Rights of the Child of the United Nations Children's Fund pointed out that, the child shall have the right from birth to a name, the right to acquire a nationality and as far as possible, the right to know and be cared for by his or her parents (70). Living with parents and being cared

TABLE 1 Descriptive statistics (n = 3,464), China, 2018.

Variable	Definition	Mean	SD	Min	Max
Explained variable					
Physical health	1 = very unhealthy; 2 = somewhat unhealthy; 3 = normal; 4 = somewhat health; 5 = very healthy	3.995	0.820	1	5
Mental health	Total score of the CES-D ranges from "20" to "80." The higher CES-D score, the deeper depression, and the worse mental health	26.858	8.217	20	80
Explanatory variable					
Living without parents (0–6 years)	0 = living with parents; 1 = living without parents	0.096	0.295	0	1
Living without parents (7–12 years)	0 = living with parents; 1 = living without parents	0.104	0.305	0	1
Living without parents (13–15 years)	0 = living with parents; 1 = living without parents	0.140	0.347	0	1
Living without parents (16–18 years)	0 = living with parents; 1 = living without parents	0.219	0.413	0	1
Control variable					
Gender	1 = male; 0 = female	0.454	0.498	0	1
Age	Years old	28.225	5.206	18	36
Education	Years of schooling education of respondent	11.523	3.913	0	23
Marital status	1 = married; 0 = unmarried	0.702	0.457	0	1
Logarithm of income	Logarithm of total annual income of respondent in 2017	10.533	0.878	5.704	14.914
Smoking	1 = have habit of smoking; 0 = else	0.218	0.413	0	1
Drinking	1 = have habit of drinking; 0 = else	0.169	0.375	0	1
Exercise	1 = have habit of exercise; 0 = else	0.364	0.481	0	1

for by parents plays an important role in children's healthy growth and physical and mental health in their adulthood. In this study, we found that compared with children who lived with their parents, individuals who did not live with their parents during their minor years had poorer physical and mental health in adulthood. The results were heterogeneous in age stages and in gender.

Numerous previous studies have shown that the absence of parents has many negative effects on the physical and mental health of minor children (71–73). Children who are not raised by their parents are at higher risk of internet addiction, depression, anxiety, loneliness, suicidal ideation, drug abuse, wasting, stunting, and sickness (71–73). Further, existing studies have found that the effect of parental absence is far-reaching (24–28). Consistently, our empirical results in this study support the above conclusions. The results showed that in terms of physical and mental health, the effect of parental absence on their children is not only immediate, but also into adulthood. Therefore, our general conclusion is that the presence or absence of parents in the household as children grow has both current and long-term impacts on physical and mental health.

This study enriches the research on how adverse experiences in pre-adulthood have negative effects on individuals in adulthood (74). Living with parents is beneficial, and arguably the most important support for children as they grow up (75, 76). From this point of view, not living with parents while growing up can be regarded as an adverse experience of minors. Immediate negative impacts include malnutrition and autism (71–73), but long-term negative effects on physical and mental health in adulthood also are evident as found in this study.

Building on previous studies (39–42, 45, 46), we explored the effects of parental absence based on different age ranges and genders. We found heterogeneous results. Our data showed that as the age of a child increases, the negative effect of living without parents on physical and mental health in adulthood gradually decreases. For younger children, their self-care ability is weaker, they have more emotional needs from adults, and they need more companionship from parents, compared with older children, from the perspective of developmental psychology (77). However, as children growing older, many of them try to become more autonomous from their parents (43). During adolescence and near adulthood, peers, such as close friends or romantic partners, often replace parents and become their attachment figures (43). This enlightens us that the younger the children, the more important it is for their parents to be living with them. This also indicates that

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TABLE 2 Influences of living without parents at different stages before adulthood on individual physical and mental health in adulthood, China, 2018.

Variables	Physical health (ordered probit)				Mental health (OLS)			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Living without parents (0–6 years)	−0.223***				2.632***			
	(0.064)				(0.471)			
Living without parents (7–12 years)		−0.169***				2.178***		
		(0.061)				(0.454)		
Living without parents (13–15 years)			−0.099*				1.355***	
			(0.054)				(0.402)	
Living without parents (16–18 years)				−0.022				0.696**
				(0.046)				(0.340)
Gender	0.026	0.024	0.025	0.024	−0.817**	−0.791**	−0.803**	−0.784**
	(0.047)	(0.047)	(0.047)	(0.047)	(0.345)	(0.345)	(0.346)	(0.346)
Age	−0.017***	−0.016***	−0.016***	−0.015***	0.048	0.042	0.040	0.034
	(0.004)	(0.004)	(0.004)	(0.004)	(0.032)	(0.032)	(0.032)	(0.032)
Education	0.032***	0.031***	0.031***	0.031***	−0.180***	−0.175***	−0.172***	−0.173***
	(0.006)	(0.006)	(0.006)	(0.006)	(0.042)	(0.042)	(0.042)	(0.042)
Marital status	0.088*	0.088*	0.088*	0.087*	−1.147***	−1.150***	−1.145***	−1.141***
	(0.050)	(0.050)	(0.050)	(0.050)	(0.369)	(0.369)	(0.370)	(0.370)
Logarithm of income	0.046*	0.045*	0.045*	0.045*	−0.216	−0.207	−0.212	−0.203
	(0.024)	(0.024)	(0.024)	(0.024)	(0.177)	(0.177)	(0.177)	(0.177)
Smoking	0.072	0.073	0.073	0.071	−0.512	−0.521	−0.527	−0.517
	(0.057)	(0.057)	(0.057)	(0.057)	(0.421)	(0.421)	(0.422)	(0.422)
Drinking	−0.009	−0.005	−0.005	−0.005	1.222***	1.181***	1.172***	1.161***
	(0.057)	(0.057)	(0.057)	(0.057)	(0.420)	(0.420)	(0.421)	(0.422)
Exercise	0.084**	0.085**	0.086**	0.086**	−0.032	−0.046	−0.062	−0.069
	(0.041)	(0.041)	(0.041)	(0.041)	(0.301)	(0.302)	(0.302)	(0.303)
Region	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
n	3,464							
Pseudo R^2	0.045	0.044	0.044	0.043				
R-squared					0.050	0.048	0.045	0.043

Standard errors in parentheses; ***p < 0.01, **p < 0.05, *p < 0.1; "Yes" means the variable is added to the model.

parents' intervention in children's health should start from the early stage of their children's life.

We also found that the negative long-term impact of parental absence on physical and mental health is greater for girls than for boys. It implies that in the process of growing up, girls need parents' company more than boys. Therefore, it is particularly important for parents to accompany the growth of their female children. China has a historical tradition of prioritizing boys over girls, and compared to boys, girls may have poor access to parents' care, education, and health services (78). If the parents are absent, the children may be taken care of by their grandparents, who have a more traditional idea of valuing boys over girls, and the girls are less well cared for. Therefore, the absence of parents has a greater impact on girls than boys. Thus, government and non-governmental organizations should formulate relevant policies and increase support for girls' parents to ensure that they are not separated from their minor children. In the long run, strengthening the publicity and education of gender equality, and

TABLE 3 Influences of living without parents at different stages before adulthood on individual physical health in adulthood between different genders, China, 2018.

Variables	Physical health (ordered probit)							
	(1) Male	(2) Female	(3) Male	(4) Female	(5) Male	(6) Female	(7) Male	(8) Female
Living without parents (0–6 years)	−0.161*	−0.285***						
	(0.093)	(0.088)						
Living without parents (7–12 years)			−0.114	−0.217***				
			(0.091)	(0.084)				
Living without parents (13–15 years)					−0.052	−0.120		
					(0.078)	(0.076)		
Living without parents (16–18 years)							0.006	−0.031
							(0.067)	(0.063)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Region	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
n	1,574	1,890	1,574	1,890	1,574	1,890	1,574	1,890
Pseudo R^2	0.046	0.057	0.046	0.056	0.046	0.055	0.045	0.054

Standard errors in parentheses; ***p < 0.01, *p < 0.1; "Yes" means the variable is added to the model.

TABLE 4 Influences of living without parents at different stages before adulthood on individual mental health in adulthood between different genders, China, 2018.

Variables	Mental health (OLS)							
	(1) Male	(2) Female	(3) Male	(4) Female	(5) Male	(6) Female	(7) Male	(8) Female
Living without parents (0–6 years)	2.014***	3.246***						
	(0.689)	(0.651)						
Living without parents (7–12 years)			1.793***	2.634***				
			(0.672)	(0.621)				
Living without parents (13–15 years)					0.971*	1.755***		
					(0.578)	(0.566)		
Living without parents (16–18 years)							0.475	0.999**
							(0.498)	(0.469)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Region	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
n	1,574	1,890	1,574	1,890	1,574	1,890	1,574	1,890
R-squared	0.045	0.071	0.044	0.067	0.041	0.063	0.040	0.061

Standard errors in parentheses; ***p < 0.01, **p < 0.05, *p < 0.1; "Yes" means the variable is added to the model.

TABLE 5 Propensity score matching estimation of the effects of living without parents at the ages of 0–6/7–12/13–15/16–18 on individual physical and mental health in adulthood, China, 2018.

Method		Nearest neighbor	Radius	Kernel	Local linear regression
0–6 years	Physical health (ATT)	−0.215***	−0.201***	−0.192***	−0.203***
		(−3.92)	(−4.04)	(−3.89)	(−3.19)
	Mental health (ATT)	0.264***	0.276***	0.277***	0.278***
		(4.25)	(4.79)	(4.84)	(3.97)
7–12 years	Physical health (ATT)	−0.145***	−0.151***	−0.142***	−0.152***
		(−2.75)	(−3.15)	(−2.99)	(−2.46)
	Mental health (ATT)	0.259***	0.234***	0.233***	0.234***
		(4.56)	(4.41)	(4.42)	(3.59)
13–15 years	Physical health (ATT)	−0.132***	−0.112***	−0.110***	−0.118**
		(−2.89)	(−2.70)	(−2.67)	(−2.18)
	Mental health (ATT)	0.174***	0.164***	0.163***	0.170***
		(3.56)	(3.59)	(3.61)	(3.06)
16–18 years	Physical health (ATT)	−0.132***	−0.112***	−0.110***	−0.118**
		(−2.89)	(−2.70)	(−2.67)	(−2.18)
	Mental health (ATT)	0.174***	0.164***	0.163***	0.170***
		(3.56)	(3.59)	(3.61)	(3.06)

ATT means the average treatment effect on treatment. T-statistics are reported in parentheses. The element number of the nearest-neighbor matching with a caliper was 4, the radius was set to 0.01 in radius matching, and kernel matching and local-linear matching used default kernels and bandwidth. ***$p < 0.01$, **$p < 0.05$.

giving incentive policies, are crucial for girls to get better care from their elders.

The findings of our study have strong practical significance for China. According to the Office of the Leading Group of the State Council for the Seventh National Population Census, as of 2020, a total of 6.436 million children in rural China were left behind when their parents moved from the country to cities to work (29). These children were separated from their parents for most of the year and lived with other relatives, mainly grandparents, with some even living alone (79). Our data analysis confirmed the results of previous studies, which showed that the absence of parents can have a negative effect on the physical and mental health of minors (71–73), and the negative effects can continue into adulthood (24–28). Therefore, it should be the direction of policy efforts to avoid the separation of parents and young children as much as possible.

The decision of parents to separate from their young children is undoubtedly difficult. It is not only an individual decision, but also related to the institutional nature of this issue. The government should make feasible arrangements to reduce the need to separate minor children from their parents. Non-governmental organizations and citizens can also play an active role in creating a social consensus that parents should stay with their minor children. A suboptimal strategy is to provide early intervention for children living without parents, in an attempt to prevent current and future physical and mental health issues.

Our study had some limitations that deserve mention. First, the data regarding who the respondents lived with before adulthood were obtained through the respondents' recall. Because human memory is known to be unreliable, the data may not completely accurately reflect the truth. If future research could track and monitor who minors live with until they reach adulthood, the conclusions could be more objective. Second, the mechanism influencing the long-term impacts of the absence of parents in childhood is still not clear. There is opportunity for future research in this direction. Third, the measurement of physical health in this study relied on one item of self-rated physical health, which may result in measurement bias. For this reason, future studies can use more objective measurements of individuals' physical health. Forth, previous studies have found that father and mother may play heterogeneous roles in children's psychological adjustment; however, restricted by the data availability, we cannot investigate the heterogeneous effects of living without father or mother on children's health in adulthood. Thus, the future study can consider testing the heterogeneous effects of living without father or mother.

Conclusions

Employing data from a nationwide survey in China, this study analyzed how living without parents at different stages of childhood and adolescence affects an individual's physical and mental health in adulthood. Although the results were heterogeneous at different age stages and for different genders, our analysis showed that growing up without the presence of parents in the household can have a significant negative effect on the physical and mental health of individuals in adulthood. Therefore, the presence of a parent is important for children's health, and has a long-term effect. Future research exploring the mechanism of this effect will be key to

furthering our understanding of the long-term effect of lack of parental companionship during childhood.

Data availability statement

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

Author contributions

YJ developed the method, wrote the results and discussion, and modified and edited the whole manuscript. HX wrote the literature review, theoretical analysis, results, and modified and edited the whole manuscript. FY proposed the idea of this paper, provided guidance in the theory, modified and edited the whole manuscript, and played the role of supervisor. All authors have read and agreed to the published version of the manuscript.

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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.

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Family intimacy and adolescent peer relationships: investigating the mediating role of psychological capital and the moderating role of self-identity

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According to existing research, family intimacy affects the formation of peer relationships among adolescents; Parent–child relationships may influence children's relationships with peers, but the mechanism of its influence is still unclear due to the uncertainty of its effect. According to the ecological systems theory, this study examines how family intimacy affects adolescent peer relationships through psychological capital and how self-identity moderates this effect. These hypotheses were tested based on a survey of 414 adolescents, which showed that family intimacy positively affects adolescent peer relationships; The relationship between family intimacy and adolescent peer relationships is mediated by psychological capital; Self-identity positively moderates the direct effects of family intimacy and adolescent peer relationships; Self-identity not only positively moderates the direct effect of psychological capital and adolescent peer relationship, but also positively moderates the indirect effect of family intimacy on adolescent peer relationship through psychological capital. This study provides new perspectives on the relevant mechanism of family intimacy and adolescent peer relationships.

KEYWORDS

adolescent peer relationships, family intimacy, psychological capital, self-identity, ecological systems theory

1. Introduction

For decades, peer relationships have been considered by scholars to be one of the most important social relationships for adolescents. Peer relationship is a kind of interpersonal relationship developed by individuals of similar age or psychological development levels in the process of communication and cooperation. It is regarded as an important indicator to effectively measure the ability of adolescents to adapt to the social environment and cope with difficulties (Rubin et al., 2013). As non-kinship relationships, the development of adolescent peer relationships is affected by many different factors in family, school, and society (Ladd et al., 2008; Zhu et al., 2022). Adolescents who are unable to effectively establish positive peer relationships may experience a decrease in their ability to accurately assess the value of relationships (Rosenbach and Renneberg, 2014; Long et al., 2021), and even show withdrawal and avoidance

of future interpersonal communication and social activities (Molden et al., 2009; Haddow et al., 2021). Having good peer relationships plays an important role for individuals in adolescence. On the one hand, it can help adolescents develop positive interpersonal relationships and adapt to complex social situations, which directly impacts adolescents' self-identity; on the other hand, it can be a valuable source of emotional support for adolescents (Crosnoe and Johnson, 2011). Ecological systems theory suggests that everyone lives in a specific environment. Family and peer relationships are the most important microsystems for adolescents (King et al., 2016; McMahon et al., 2020). It has been found that family intimacy affects adolescent peer relationships (Zemp et al., 2018; Noonan and Pilkington, 2020). The influential mechanism of the complex relationship between family background and peer relationships needs further investigation. Therefore, it is meaningful to study the influence mechanism of family intimacy on peer relationships, which can improve the level of positive peer interaction among adolescents.

How to establish positive peer relationships has become a focus of attention in education, psychology, medicine, and other fields. Based on Bronfenbrenner's (1979) ecological systems theory, Peer relationships have been shown to be significantly affected by parental conflict (Mcdowell and Parke, 2005; Racz et al., 2017), family socioeconomic status (Hjalmarsson, 2018; Bukowski et al., 2020), and parent–child communication (Runcan et al., 2012; O'Mara and Schrodt, 2017). Positive peer relationships among adolescents can also be affected by school factors in addition to family factors, such as academic performance (Horoz et al., 2022), school exclusion (Gabbiadini and Riva, 2018; Andrews et al., 2019), and school belonging (Demanet and Van Houtte, 2012; Fong Lam et al., 2015). Despite this, most of the data to date show that research has focused primarily on peer relationships as a factor in adolescents' psychological development and social adjustment, while the exploration of family intimacy in adolescents' positive peer relationships has been very limited. The factors of family intimacy on the establishment of adolescent peer relationships and the complex mechanism of action between these factors should be further explored in future research to provide theoretical guidance for improving the establishment of positive adolescent peer relationships.

This study examines the current body of research on adolescent peer relationships, focusing on three key areas. First, this study aims to investigate the influence of family intimacy on adolescent peer relationships. Family intimacy can reflect the degree of emotional connection that an individual feels with other family members and is an important indicator reflecting the emotional relationships and positive family atmosphere among family members (Lambert et al., 2010; Umberson and Thomeer, 2020). When adolescents have someone who supports them emotionally, they feel peaceful in the face of stress (Romano et al., 2021), and their extraversion and emotional stability are also more obvious. A review of previous literature indicates that most existing research on family intimacy and adolescent peer relationships follows three paths: behavioral problems (Cummings et al., 2015; Weymouth et al., 2016), psychological development (Sabatelli and Anderson, 1991; Gregory and Sadeh, 2012), and social skills (Okuno et al., 2016; Curran et al., 2021). Peer groups are not only just a source of motivation for adolescent development, but also an important driving force for personal social–emotional development, positive mental health development, and even academic development (McFarland et al., 2014). As a result, it is imperative to examine the impact of family intimacy on adolescents' peer relationships.

Second, the study explores how psychological capital mediates the relationship between family intimacy and adolescent peer relationships. In ecological systems theory, individuals and the factors around them are interdependent and mutually constrained. Psychological capital refers to positive psychological resources. It is the positive psychological state shown by individuals when they get along with their families and peers in their growth environment (Çavuş and Gökçen, 2015), revealing the interaction process between individuals and other social factors. It includes four characteristics: psychological resilience, optimism, sense of efficacy, and hope. When these characteristics are combined, they have a more positive influence on individuals (Grover et al., 2018). Having close family relationships can contribute to the development of positive psychological states in an individual (Luthans et al., 2005; Waters et al., 2022). Psychological capital has been shown to positively influence individual attitudes and behaviors (Hobfoll, 2002; Kun and Gadanecz, 2022). Psychological capital, as the mechanism of family intimacy in adolescent peer relationships, deserves further investigation.

Finally, self-identity is examined in this study as a moderating factor in the relationship between family intimacy and adolescent peer relationships as well as between psychological capital and adolescent peer relationships. According to the ecological systems theory, adolescents have strong family emotional support, which will have an important impact on their peer communication and social adaptation (Luthans et al., 2007). However, not all adolescents are like this. The growth of adolescents is a process of self-cognition and self-development, which will continue to change with different ages and experiences (Korol, 2021). The moderating effect of self-identity on adolescent psychological adaptation has been confirmed. When faced with stress and difficulties, A low sense of self-identity among adolescents increases the likelihood of depression and withdrawal (Toti et al., 2020). Different levels of self-identification will affect adolescents' different psychological states, thus affecting adolescents to make a more comprehensive and objective understanding of themselves (Dugarova et al., 2020; Rizki and Keliat, 2021). However, previous studies have rarely addressed this effect. Therefore, this study proposes that self-identity is a moderating variable between family intimacy and psychological capital.

This study makes three contributions. Firstly, it examines the influence of family intimacy on adolescent peer relationships through the lens of ecological systems theory; Secondly, this study explores the mechanism of adolescents' psychological capital affecting family intimacy and peer relationships from the perspective of ecological systems theory; Thirdly, our research makes a contribution by exploring the role of self-identity as a moderate between family intimacy and adolescent peer relationships, as well as between psychological capital and adolescent peer relationships. This study emphasizes the importance of valuing one's sense of self-identity and actively cultivating it, as it can promote the development of healthy peer relationships during adolescence.

2. Theory and hypothesis

In this study, the role of family intimacy in peer relationships among adolescents is supported theoretically. According to the

ecological systems theory, the relevant conceptual research framework and hypothesis are proposed in this study. Influencing factors will be explored through empirical research using the conceptual framework.

2.1. Ecological systems theory

The ecological systems theory was developed by Bronfenbrenner (1979), which revealed the interplay between different systems, and the pathways by which family intimacy affects adolescent peer relationships can be better understood when this interaction is explicitly considered. Some studies believe that the social environment will affect the physical and psychological characteristics of individuals, and all environments from family to economy and politics have become part of the life development process (Ceci, 2006; Ozaki et al., 2020). The bioecological model proposed by Bronfenbrenner is one of the most cited theories in related fields (Crawford, 2020; Yu et al., 2021). It has expanded from research on personal development to research on the balance of family, school, and social development (Dobson and Douglas, 2020; El Zaatari and Maalouf, 2022).

In addition to ecological systems theory, some studies have used attachment theory (Mathes et al., 2020), cognitive-situation theory (Siffert and Schwarz, 2011), and perfectionism theory (Stumpf and Parker, 2000) to examine how family intimacy affects adolescent peer relationships. Adolescents' behavior and psychological development are strongly influenced by their family environment, which is the basic unit of society. Some studies have found that the development of adolescents' poor peer relationships, low academic performance, and poor social skills are inextricably linked to family factors such as weak intimacy among family members, inappropriate emotional expression, and improper parenting styles. Many problem behaviors of adolescents do not originate from themselves but are affected by the family environment (Buehler, 2020; Scully et al., 2020). According to Ruzek et al. (2016), Social adjustment and mental health of adolescents are heavily influenced by peer relationships. It requires adolescents to use self-identity to actively coordinate the relationship between individuals, families, and peers. Living in an environment with close family intimacy, adolescents are more likely to form self-identity. At the same time, psychological capital may enable individuals to perceive and evaluate the availability of their positive mental states. In the context of psychological capital, a better understanding of the mechanism by which external family environmental factors affect the internal psychological state and behavioral performance of adolescents. Guided by ecosystem theory, this paper establishes a theoretical framework to explain the mechanism by which family intimacy affects peer relationships, and demonstrates the effect of psychological capital and self-identity under the above mechanism.

2.2. Research hypothesis

The impact of family intimacy on adolescent peer relationships is primarily examined through the following hypothesis. Psychological capital and self-identity are introduced as mediating variables and moderating variables in the analysis of the effects of family intimacy on adolescent peer relationships in adolescents. Figure 1 below shows the research framework.

2.2.1. Family intimacy and adolescent peer relationships

Sociology believes that interpersonal relationship is the direct psychological connection established by people in communication. The intimacy and adaptability of the family are indicators to measure the family function and the overall operation of the family (Zhang and Wang, 2020). According to social learning theory, adolescents will apply the imitated parental mode of communication to their peer communication (Chuang, 2021). Existing research indicates that close parent–child relationships are beneficial for adolescents' interpersonal skills and social adjustment (Lindell et al., 2021).

On the one hand, empirical studies have shown that in the family context, establishing an emotional connection between parents and children refers to an intimate relationship between them, and has an optimization and promotion effect on adolescents' social cognition and interpersonal relationships. Adolescents living in low family intimacy environments have higher odds of feeling lonely and alienated in social interactions, which leads to anxiety and negative emotional states and interferes with adolescents' interpersonal communication and daily learning and living (Martyn et al., 2009). On the other hand, research confirms that good family intimacy and positive psychological states of adolescents can influence and interact with each other (Cassels and Wilkinson, 2016). Relevant researchers have also studied the mechanism of family intimacy and adolescent peer relationships from the aspects of family-rearing style, evolutionary psychology, and social cognitive development. This leads to the following hypothesis:

> *H1*: Family intimacy positively affects adolescent peer relationships.

2.2.2. Family intimacy and psychological capital

The close family environment can promote the formation of individual positive psychological capital (Peterson et al., 2008; Xu et al., 2022). First, different parenting styles and communication styles of parents will lead to differences in children's ability to get along with peers and adapt to socialization from the family environment with which they are most closely connected (Gimenez-Serrano et al., 2022). Second, family intimacy influences adolescents' social, psychological, and behavioral development to some extent (Haggerty et al., 2022). Adolescents who live in a healthy family environment also score higher on the four elements of psychological capital. They can be more optimistic and positive in the face of stress and negative emotions (optimistic), have more hope and confidence in the future (hope), have a higher self-efficacy in coping with negative motivation (self-efficacy), and have stronger psychological resilience in the face of external stimuli (psychological resilience) (Zeng et al., 2021). This leads to the following hypothesis:

> *H2*: Family intimacy positively affects psychological capital.

2.2.3. Psychological capital and adolescent peer relationships

Psychological capital can provide individuals with important protective resources and cognitive resources for social adaptation and creative activities (Luthans et al., 2007; Poots and Cassidy, 2020). The

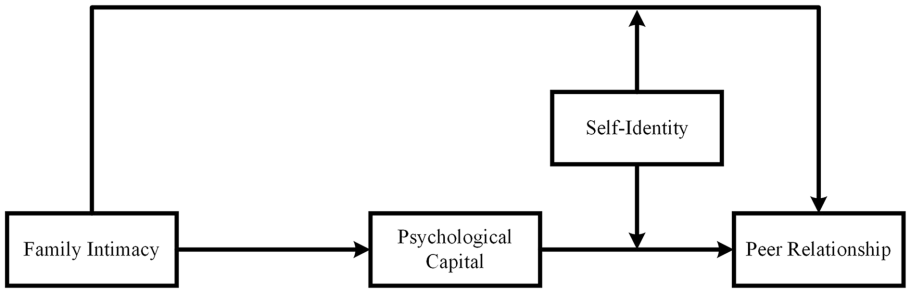

FIGURE 1
Theoretical model.

internal and external resources possessed by individuals with high psychological capital will encourage individuals to engage in more positive behaviors and make more positive attributions when faced with changes in the external environment, pressure, and failure (Luthans et al., 2005). Meanwhile, individuals with higher psychological capital also have a better positive state (Avey et al., 2008; Lei et al., 2020), and it is easier for them to obtain positive energy supplements from the external world when dealing with risks (Datu et al., 2016). Psychological capital has been shown to influence behaviors, attitudes, studies, and peer relationships in positive ways (Newman et al., 2014). In summary, adolescents with higher psychological capital also tend to have more positive peer relationships with their peers. This leads to the following hypothesis:

> *H3*: Psychological capital positively affects adolescent peer relationships.

2.2.4. Family intimacy, psychological capital, and adolescent peer relationships

Adolescents tend to establish equal peer relationships with non-authoritative individuals, which is different from vertical relationships such as parent–child relationships and teacher-student relationships. Interpersonal relationships will change to some extent as individuals grow. When entering early adulthood, adolescents will hope to gain more autonomy and independence from their parents, and the importance of peer relationships will also become more important (Reavis et al., 2015). Adolescents living in an environment with closer family intimacy will develop a more wholesome personality and better peer relationships. For adolescents who are at the stage of vertical relationships to parallel transformation relationships, the influence of peer relationships on their healthy psychological condition, good mental condition, and positive social adaptability is becoming more and more important (Oberle et al., 2018). The socialization development, personality formation, and peer relationship establishment of adolescents are inseparable from the influence of family intimacy (Dunn, 2004). Studies have found that adolescents who have been in an environment with long-term unbalanced parental relationships and family intimacy have lower levels of interpersonal security, weaker interpersonal skills, and are more prone to negative emotions. Close family intimacy is significantly positively correlated with interpersonal skills (Kuo et al., 2007). However, family is one of the microsystems that affects individuals, and family intimacy does not directly affect the establishment of positive adolescent peer relationships. A high level of psychological capital contributes to well-being, emotional commitment, organizational identity, and interpersonal communication (Bea and Chang, 2015). Reasonable use of positive psychological capital is more conducive to adolescents mobilizing other resources to regulate the pressure in the process of growth, cope with negative emotions and improve peer communication skills (Newman et al., 2014). This leads to the following hypothesis:

> *H4*: The effect of family intimacy on adolescent peer relationships is mediated by psychological capital.

2.2.5. The moderating effect of self-identity

Self-identity was introduced to the field of psychology by Erikson, an American psychologist (Ochse and Plug, 1986). Erikson divides life into eight stages, each stage has different contradictions, and individuals grow accordingly in the process of resolving the contradictions at different stages. The primary task of individuals in adolescence is the establishment of self-identity, which is dynamic and continuous self-knowledge, self-evaluation, and self-identity of individuals in the social environment structure (Rodríguez-Meirinhos et al., 2020). The micro-system that individuals first contact is family. From family relationships, individuals begin to understand themselves and form a preliminary sense of self-identity. Having a strong sense of self-identity can correctly recognize the difficulties and challenges in their social environment and help them make adaptive responses. Higher self-identity is linked to better mental health (Sánchez-Miguel et al., 2017). Adolescents with high self-identity are more optimistic and outgoing than those with low self-identity, and their psychological status is also healthier and more mature. To some extent, self-identity has a predictive effect on adolescent mental health (Dugarova et al., 2020). In addition, when adolescents have a higher sense of self-identity, their self-control and self-regulation abilities are also stronger, which is conducive to the establishment of adolescent peer relationships and the optimization of adolescent social development (Huang et al., 2021). Research confirms that positive correlation between adolescent self-identity and friendship quality, and at the same time, the model suggests that self-identity moderates the relationship between family intimacy and peer relationships among adolescents. This leads to the following hypothesis:

> *H5*: Self-identity moderates the relationship between family intimacy and adolescent peer relationships. When adolescents have a high sense of self-identity, the positive relationships between family intimacy and adolescent peer relationships is stronger.

Studies on psychological capital have shown that adolescents experiencing family risks do not mean that they will have mental health problems, and certain personal qualities or environmental factors will help adolescents overcome adverse influences (Wright et al., 2013). Luthans et al. (2005) linked growth in self-identity to psychological abilities. As an internal force, positive psychological capital can help individuals enhance their ability to overcome difficulties and pressures, and at the same time improve their ability to adapt to society (Chen et al., 2022). This leads to the following hypothesis:

> *H6*: Self-identity moderates the relationship between psychological capital and adolescent peer relationships. The higher the self-identity of adolescents, the stronger the impact of psychological capital on adolescent peer relationships.

With a high level of self-identity is beneficial for enhancing the relationship between psychological capital and adolescent peer relationships. Furthermore, Erikson (1994) believes that psychological capital is affected by personal self-identity to some extent. We further believe that Self-identity can be used to alleviate the impact of family intimacy on adolescent peer relationships through psychological capital. In addition, since the mechanisms through which family intimacy acts on adolescents' peer relationships may vary according to the level of self-identity, we believe that under a high level of self-identity, family intimacy has a greater impact on psychological capital, which will greatly improve the establishment of peer relationships among adolescents. Therefore, we combined Hypothesis 4 and Hypothesis 6, and then came up with Hypothesis 7:

> *H7*: Self-identity positively moderates the mediating effect of psychological capital, and the mediating effect is enhanced when self-identity is high.

3. Methods and procedures

This research mainly explores the mechanism of family intimacy in adolescent peer relationships and has no unethical conduct in the course of the research. The data collected in this research process is in an anonymous form, and the filling of the questionnaire follows the voluntary principle; therefore, according to the requirements of local laws, regulations, and institutions, this research does not require ethical approval and consent.

3.1. Data collection

The data collected through the questionnaire comes from different schools, different grades and different individuals. Before filling out the questionnaire, the purpose and use of collecting the questionnaires have been explained in detail to students and their head teachers, and the consent and support of the head teachers have been obtained. This study does not involve human clinical trials, and the questionnaires are filled out voluntarily and collected anonymously. The students themselves completed questionnaires on family intimacy, psychological capital, self-identity, and quality of friendships. In order to ensure that the data and questionnaire are valid and rational, this study focused on individual-level measurements and analyses, this study selected two schools in China (Enshi Vocational and Technical College and Hubei Minzu University) in March 2021 for a pre-survey. We invited some students from two schools to conduct questionnaire tests and interviews. The results of the questionnaire survey conducted among people with different levels of education did not show a significant difference. According to the respondents' suggestions, the questionnaire was appropriately revised based on their feedback. Before the official distribution of the questionnaire, we got in touch with Hubei Minzu University, Zhongnan University of Economics and Law, Enshi Vocational and Technical College, Lichuan NO. 1 Senior High School, Xuanen NO. 1 Senior High School, Lichuan Minority Secondary Vocational School, Laifeng Secondary Vocational Technical School, and Jianshi Secondary Vocational Technical School and obtained the consent of the relevant person in charge of the school. The questionnaires cover secondary vocational schools, high schools, technical colleges, and universities, and the types of schools are relatively comprehensive. The study identified the following criteria for sample selection: (1) The respondent is over 15 years old and under 25 years old; (2) Respondents under the age of 18 need to obtain the consent of the class teacher or their parents before filling out the questionnaire. From May to September 2022, we compiled an electronic questionnaire on the Wenjuanxing platform and distributed the electronic questionnaire to respondents who met the above conditions through WeChat, email, etc. At the same time, we distributed 150 paper questionnaires to respondents at Enshi Vocational and Technical College and Hubei Minzu University. A detailed explanation of the questionnaire's content and purpose was provided when the questionnaire was distributed and communicated with them through telephone and WeChat.

In this study, we distributed a total of 500 questionnaires and returned 479 questionnaires. As a result of incomplete data filling, 56 invalid questionnaires were eliminated, and 82.8% of them were effective. Based on the data collected, Table 1 indicates the basic personal information and basic family information of the respondents in both schools. Respondents consisted of 58 male students (14.01%) and 356 female students (85.99%). In terms of age structure, there are 60 people aged 15–18, accounting for 14.49%, and 354 people aged 19–25, accounting for 85.51%. From the perspective of education level, most of the respondents have obtained a junior college degree, accounting for 90.34%. In terms of family information, non-single-child families accounted for 85.02%, non-single-parent families accounted for 86.47%, rural families accounted for 66.67%, families with more than 4 people accounted for 82.13%; Most of the family's annual income was less than 80,000¥, accounting for 83.57%.

3.2. Measurement

The scale translation method we adopted in this study is based on the suggestion of Brislin (1980). This study used translation and

TABLE 1 Basic information of the respondents.

Attributes	Items	Frequency	Percent (%)
Gender	Male	58	14.01
	Female	356	85.99
Age	15–18	60	14.49
	19–25	354	85.51
Education	High school (secondary vocational schools)	14	3.38
	Junior college	374	90.34
	College or above	26	6.28
Only child	Yes	62	14.98
	No	352	85.02
One parent family	Yes	56	13.53
	No	358	86.47
Rural or urban residence	Urban	138	33.33
	Rural	276	66.67
Household size	One	4	0.97
	Two	14	3.38
	Three	56	13.53
	Over three	340	82.13
Yearly household income	Below 20,000 ¥	110	26.57
	20,000—40,000¥	90	21.74
	40,001—60,000¥	60	14.49
	60,001—80,000¥	86	20.77
	Over 80,000 ¥	68	16.43

Household size refers to the number of family members living in a household, one refers to one person, two refers to two people, three refers to three people, Over three refers to more than three people.

reverse translation methods to translate the scale from English to Chinese, in order to ensure that the translation of each Chinese item in each scale should match the original version as much as possible in terms of concept and language expression, while also meeting the reading cognition of Chinese. First, team members with overseas study experience will translate each item of each scale from English to Chinese. Second, the domestic professors were requested to correct each item in the above translation, and some sentences were slightly changed according to the feedback from the professors. Finally, all Chinese entries are back-translated into English by team members with overseas study experience. During the questionnaire, participants were informed of their level of agreement with each statement of the scale by selecting a number. From 1 to 5 for the family intimacy scale; 1 to 4 for the self-identity scale; 1 to 7 for the psychological capital scale and 1 to 5 for the peer relationships scale. The Likert scale anchor points used in questionnaires were selected in our study. Scores were correlated with adolescents' family intimacy, self-identity, psychological capital, and peer relationships.

1. Family Intimacy. Olson et al.'s (2013) Family Intimacy and Adaptability Scale was used in this study to measure how family intimacy affects adolescent peer relationships. The scale consists of 16 items, which are self-assessed by adolescents. A sample item is "At home, we all do things together." The internal consistency coefficient of the family intimacy scale is 0.952 in this study.
2. Self-Identity. As the measure of self-identity in this study, we adopted Ochse and Plug's (1986) self-identity scale. The scale consists of 4 items, which are self-assessed by adolescents. A sample item is, "I am not sure whether something is morally right." The internal consistency coefficient of the self-identity scale is 0.979 in this study.
3. Psychological Capital. The psychological capital scale used in this study includes four dimensions of self-efficacy, optimism, resilience, and hope. The scale was developed by Luthans et al. (2007). The scale consists of 7 items, which are self-assessed by adolescents. A sample item is, "I can handle many things in my life at once." The internal consistency coefficient of the psychological capital scale is 0.991in this study.
4. Adolescent Peer Relationships. According to previous studies, peer relationships can be characterized by friendship quality scale (Mounts, 2004; Doumen et al., 2012). This study uses Parker and Asher developed friendship quality scale. The scale consists of 7 items, which are self-assessed by adolescents. A sample item is, "We often get angry with each other." The internal consistency coefficient of the adolescent peer relationships scale is 0.965 in this study.
5. Control Variable. Some existing studies have shown that personal characteristics of adolescents, such as gender, age, and educational background, have a significant impact on their peer relationships (Adedeji et al., 2022). Meanwhile, family environmental factors such as only child, single parent family, living in rural or urban areas, family size, and yearly family income have a significant impact on adolescent peer relationships (Boele et al., 2019; Livazović and Ham, 2019; Jambon and Malti, 2022). Therefore, controlled variables in the study include gender, age, educational background, only child, single parent family, urban or rural residence, family size, and yearly family income.

4. Data analysis

4.1. Common method variance

There may be a method bias in this study because all questionnaires were filled out by adolescents themselves (Podsakoff et al., 2003). Testing for common method bias was conducted using the Harman single-factor monitoring method. The first factor can explain 32.459% of the variation after testing and the critical value is less than 40%. Consequently, this study displays no serious common method biases.

4.2. Reliability and validity test

In this study, SPSS26 and AMOS24 were used to calculate the composite reliability value (CR), Cronbach's value, and average variance extraction (AVE) of the relevant data, which were used to test the credibility of the study. In Table 2, all variables have Cronbach's

coefficients greater than 0.9, and all CR values have greater than 0.7. A high level of reliability can be inferred from the scale. The average variance extraction AVE values of all variables were above 0.5. What's more, there is a high degree of convergent validity and high convincing within all constructs, as their AVE values are greater than 0.5.

According to Scott (1995), the chi-square/degrees of freedom (λ^2 /df), comparative fit index (CFI), Tucker-Lewis index (TLI), root mean square error of approximation (RMSEA)and incremental fit index (IFI)were used to test the model fit. The ideal values are: the λ^2 /df is less than 3, CFI, TLI, and IFI are greater than 0.9, and RMSEA is greater than 0.05 (MacCallum et al., 2006). What's more, compared to other models, the four-factor model's monitoring indicators have reached the ideal standard, as shown in Table 3. Therefore, all scales in this study have ideal discriminant validity.

4.3. Descriptive analysis

Based on the results of SPSS26, Table 4 shows the standard deviations and correlation coefficients of family intimacy, psychological capital, self-identity, and peer relationships. From Table 4, family intimacy is significant and peer relationships are positively related ($r = 0.399$, $p < 0.01$), family intimacy is significant and psychological capital is positively related ($r = 0.423$, $p < 0.01$). A positive correlation exists between peer relationships and psychological capital ($r = 0.330$, $p < 0.01$). According to these results, this study has preliminarily supported its main hypothesis.

5. Hypothesis testing

5.1. Mediation analysis

Causal stepwise regression (Baron and Kenny, 1986) and Sobel test (Sobel, 1982) were used to test the mediating effect of this study. Following the suggestion of Baron and Kenny (1986), this study uses SPSS26 to examine the influence of family intimacy on adolescent peer relationships, the impact of family intimacy on psychological capital, and the impact of psychological capital on adolescent peer relationships. Reflected from Table 5, model 1a shows control variables explain 1.9% of adolescent peer relationships. Adding the independent variable to model 2a results in a significant regression coefficient between family intimacy and adolescent peer relationships ($\beta = 0.459$, $p < 0.001$), and the R^2 explanation increase significantly as well ($\triangle R^2 = 15.9\%$, $p < 0.001$), in conclusion, hypothesis 1 is supported. It can be seen from model 3a that the control variables explain 3.1% of psychology capital. In model 4a, after adding the independent variable, the regression coefficient of family intimacy on psychological capital is positive ($\beta = 0.979$, $p < 0.001$), there is a significant increase in the R^2 explanation ($\triangle R^2 = 17.6\%$, $p < 0.001$), hypothesis 2 is therefore supported. To examine the effects of family intimacy and psychological capital on adolescent peer relationships, model 6a simultaneously introduces both into the regression. After introducing psychological capital to compare model 2a and model 6a, the relationship between adolescent peer relationships and family intimacy has decreased in both coefficient and significance ($\beta = 0.459$, $p < 0.001$; $\beta = 0.370$, $p < 0.001$). Therefore, family intimacy and psychological capital have significant effects on adolescent peer relationships. Meanwhile, the variance explained by family intimacy and psychological capital on adolescent peer relationships in model 6a ($\triangle R^2 = 0.186$) increased significantly compared to model 2a ($\triangle R^2 = 0.159$). Additionally, the Sobel test showed that the Z-value was 3.399, $p < 0.001$, indicating that a mediating effect existed (Sobel, 1982). In other words, adolescent peer relationships and family intimacy are mediated by psychological capital, which supports hypothesis 4.

TABLE 2 Reliability results.

Factor	Cronbach α	AVE	CR
Family intimacy	0.952	0.553	0.952
Peer relationships	0.965	0.606	0.965
Psychological capital	0.991	0.876	0.991
Self-identity	0.979	0.710	0.979

5.2. Moderation analysis

This study tested moderating effects of self-identity using SPSS26, considering reinforcing the influence of the independent variable on the dependent variable through the moderating variables (Baron and Kenny, 1986). To avoid multicollinearity problems, three variables including family intimacy, psychological capital, and self-identity were centered. Next, this study takes the adolescent peer relationships as the dependent variable, adding control variables, family intimacy, self-identity, and the interaction (family intimacy * self-identity) in turn, to test the moderating effect of self-identity on family intimacy on adolescent peer relationships. Also, this study tested how self-identity modifies the relationship between psychological capital and adolescent peer relationships. As shown in Table 6, in model 3b, the interaction (family intimacy * self-identity) has a significant positive impact on adolescent peer relationships ($\beta = 0.222$, $p < 0.001$), indicating that self-identity has a moderating effect on family intimacy and adolescent peer relationships, the hypothesis 5 is therefore supported. Thus, family intimacy will have a greater influence on peer relationships for adolescents with high self-identity. In model 3c, the product of psychological capital and self-identity has a significant positive impact on adolescent peer relationships ($\beta = 0.263$, $p < 0.001$), indicating that the influence of psychological capital on adolescent peer relationships is moderated by self-identity.

Furthermore, a moderated mediating effect is tested in this study using the SPSS PROCESS plug-in model 14. The PROCESS operation can obtain the moderated mediation effect index and the mediation effect under different values of the moderator variable (Hayes, 2017). Adolescent peer relationships are significantly affected by family intimacy indirectly through psychological capital. As shown in Table 7, the index of moderated mediating is 0.237, and the CI is [0.168, 0.316], excluding 0, indicating that the mediated role of psychological capital in family intimacy and adolescent peer relationships are moderated by self-identity, thus Hypothesis 7 is supported. When self-identity is at a high level, the effect of family intimacy on adolescent peer relationships through psychological capital is 0.366, the standard error is 0.524, and the CI is [0.269, 0.477], excluding 0, indicating that the moderated mediating effect is verified. The effect of family intimacy on adolescent peer relationships via psychological capital is −0.062, the standard error is 0.035, and the CI

TABLE 3 Confirmatory factor analyses.

Model	Factor	χ^2/df	RMSEA	CFI	SRMR	TLI	IFI
Four- factor model	FI，PC，SI，PR	1.288	0.026	0.979	0.035	0.978	0.979
Three- factor model	FI＋PC，SI，PR	5.098	0.100	0.695	0.195	0.686	0.696
Three- factor model	FI＋SI，PC，PR	5.393	0.103	0.673	0.227	0.663	0.674
Three- factor model	FI+ PR，PC，SI	2.781	0.066	0.868	0.108	0.863	0.868
Two-factor model	FI+ PR，PC+ SI	6.320	0.114	0.604	0.222	0.592	0.605
Two-factor model	FI＋SI，PC+ PR	5.393	0.103	0.673	0.227	0.663	0.674
Two-factor model	FI＋PC，SI+ PR	5.098	0.100	0.695	0.195	0.686	0.696
Single-factor model	FI＋PC＋SI+ PR	8.589	0.136	0.436	0.258	0.418	0.437

FI refers to family intimacy; PC refers to psychological capital; SI refers to self-identity; PR refers to peer relationships.

TABLE 4 Means, standard deviations, and interrelations of variables.

	Mean	Std. Deviation	Family intimacy	Friendship quality	Psychological capital	Self-identity
Family intimacy	3.739	0.773	**(0.744)**			
Peer relationships	3.459	0.881	0.399**	**(0.778)**		
Psychological capital	4.575	1.785	0.423**	0.330**	**(0.936)**	
Self-identity	3.061	0.903	0.115*	0.298**	0.138**	**(0.843)**

*$p < 0.05$, **$p < 0.01$. The bold values represent the square root of AVE.

is [−0.131, 0.007], including 0 when self-identity is low, indicating that the effects were not significant.

Drawing the moderating effect diagram makes it easy to assess the adjustment effect. From Figure 2A, according to the moderation effect graph, there is a trend to the upper right, which indicates that family intimacy positively influences peer relationships among adolescents. In addition, compared with adolescents with lower self-identity, adolescents with higher self-identity have a higher quality of peer relationships. Figure 2B shows that psychological capital has a greater influence on peer relationships when adolescents have a strong sense of self-identity. Adolescent peer relationships are not significantly influenced by psychological capital in adolescents with low self-identity.

5.3. Robustness analysis

In addition, structural equation modeling was used to test the robustness of hypotheses 1, 2, and 3, and the bootstrap method was used to test the robustness of the mediating effect (Hypothesis 4). The result of Amos24 calculation shows, $\lambda^2 / df = 1.349$,RMSEA = 0.029, SRMR = 0.032, GFI = 0.865, NFI = 0.933, RFI = 0.930, IFI = 0.982, TLI = 0.981, CFI = 0.982. According to Scott (1995), the structural model has a good fit. The path analysis indicated that family intimacy positively affects adolescents' peer relationships ($\beta = 0.424$, $p < 0.01$) and psychological capital ($\beta = 1.095$, $p < 0.01$), and psychological capital positively affects adolescent peer relationships ($\beta = 0.098$, $p < 0.01$), which verifies Hypothesis 1, 2, and 3. Following the suggestion of Hayes (2017), bias correction and non-parametric percentile bootstrap method were used to test hypothesis 4. AMOS 24 software was used based on the bootstrap method, a 95% confidence interval was set, and the sampling was repeated 5,000 times. If the confidence interval does not include 0, then the indirect effect is significant. As shown in Table 8, the CI of Bias-Corrected and Percentile of the direct effect and indirect effect does not include 0 in the 95% confidence interval, and $Z > 1.96$ (Shrout and Bolger, 2002), hypothesis 4 has been validated again.

6. Discussion and conclusion

This research investigates the internal mechanism and boundary conditions of the influence of family intimacy on adolescent peer relationships from the perspective of ecological systems theory. As a result (Figure 3), family intimacy positively affects adolescent peer relationships. Existing research examines the impact on adolescent peer relationships from the perspective of father, mother, parent, or sibling behavior (Boele et al., 2019). Few scholars regard the family as a whole to examine its impact on adolescent peer relationships. Psychological capital partially mediates the relationship between family intimacy and adolescent peer relationships. Similar to previous research conclusions, psychological factors are an important mechanism for the external environment to affect adolescent peer relationships (Sun et al., 2020; Bai et al., 2021; Gao et al., 2022). Family intimacy and adolescent peer relationships were moderated by self-evaluation. Existing research has confirmed that the establishment of peer relationships in specific environments is influenced by individuals' varying levels of self-identity (Wang et al., 2019; Rizki and Keliat, 2021). It is also confirmed that different degrees of self-identity, as moderator variables, also have differences in the impact of family intimacy on adolescent peer relationships. The direct effect of psychological capital and adolescent peer relationships is positively moderated by adolescent self-identity. In addition, self-identity can positively moderate the effect of family intimacy on adolescent peer

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TABLE 5 The mediating role of psychological capital.

Variable	Peer relationships		Psychological capital		Peer relationships	
	Model 1a	Model 2a	Model 3a	Model 4a	Model 5a	Model 6a
Constant	3.786***	2.249**	7.892***	4.613***	2.525*	1.918*
Gender	−0.321*	−0.285*	−0.561*	−0.484*	−0.231	−0.240*
Age	0.075	0.063	0.295	0.269	0.028	0.038
Education	0.019	−0.072	−0.414	−0.609*	−0.034	−0.017
Only child	0.182	0.214	0.116	0.185	0.163	0.197
One parent family	−0.012	0.018	−0.199	−0.133	0.019	0.031
Rural or urban residence	−0.025	0.048	−0.336	−0.181	0.029	0.064
Household size	−0.054	−0.076	−0.123	−0.172	−0.034	−0.061
Yearly household income	0.013	0.019	0.053	0.065	0.005	0.013
Family intimacy		0.459***		0.979***		0.370***
Psychological capital					0.160***	0.091***
R^2	0.019	0.178	0.031	0.207	0.121	0.205
$\triangle R^2$	0.019	0.159***	0.031	0.176***	0.102***	0.186***
F	0.999	9.745***	1.613	11.710***	6.175***	10.418***

*$p < 0.05$, **$p < 0.01$, and ***$p < 0.001$.

TABLE 6 The moderating effect of self-identity.

Variable	Peer relationships			Peer relationships		
	Model 1b	Model 2b	Model 3b	Model 1c	Model 2c	Model 3c
Constant	3.965***	3.853***	3.700***	3.264***	3.280***	3.269***
Gender	−0.285*	−0.267*	−0.196	−0.231	−0.220	−0.107
Age	0.063	0.118	0.086	0.028	0.088	0.054
Education	−0.072	−0.071	−0.044	0.085	0.072	−0.011
Only child	0.214	0.178	0.157	0.163	0.131	0.061
One parent family	0.018	0.029	0.017	0.019	0.029	0.021
Rural or urban residence	0.048	0.057	0.048	0.029	0.038	0.036
Household size	−0.076	−0.077	−0.70	−0.034	−0.039	0.000
Yearly household income	0.019	0.007	0.003	0.005	−0.006	0.024
Family intimacy	0.459***	0.426***	0.382***			
Psychological capital				0.160***	0.142***	0.137***
Self-identity		0.247***	0.294***		0.251***	0.372***
Family intimacy*Self-identity			0.222***			
Psychological capital*Self-identity						0.263***
R^2	0.178	0.241	0.270	0.121	0.185	0.418
$\triangle R^2$	0.159***	0.062***	0.029***	0.102***	0.064***	0.233***
F	9.745***	12.768***	13.494***	6.175***	9.119***	26.247***

Significance levels: $p < 0.001$ (marked as***), $p < 0.01$ (marked as **), $p < 0.05$ (marked as *).

relationships through psychological capital. Specifically, when adolescents' self-identity is stronger, the mediation effect of family intimacy on adolescent peer relationships through psychological capital is stronger. It has not been demonstrated that adolescents with a low sense of self-identity can positively moderate the influence of family intimacy on adolescent peer relationships through psychological capital. The possible reason for this situation is that the research background of this study is based on the Chinese background, and there is a certain degree of cultural background different from the previous research. When self-identity is low, their psychological capital may also be low, so when self-identity is low, the moderated mediation effect does not hold.

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6.1. Theoretical implications

There are several ways in which our research contributes to the literature. The first finding of this study is that family intimacy impacts adolescent peer relationships and it provided us with a new research direction to deepen our exploration of the mechanisms of family intimacy and adolescent peer relationships. Findings suggest that family intimacy has an impact on adolescent peer relationships. On the one hand, empirical studies have shown that positive, high-quality parent–child communication in the family context is conducive to the establishment and development of parent–child emotional bonding, adolescent social cognition, and interpersonal relationships. On the other hand, studies have indicated that close family intimacy and adaptability play a positive role in adolescents' emotional and psychological conditions (Waldinger and Schulz, 2016).

TABLE 7 The moderated mediating effect.

	Effect	SE	Confidence interval 95%	
			LLCI	ULCI
Index of moderated mediating	0.237	0.037	0.168	0.316
High SIS	0.366	0.524	0.269	0.477
Low SIS	−0.062	0.035	−0.131	0.007

The second finding of this study introduces psychological capital as a mediating variable, which enriches the literature research on adolescent peer relationships (Tu, 2020). This research demonstrates that the impact of family intimacy on adolescent peer relationships can be significantly transmitted through psychological capital (Rizki and Keliat, 2021). Psychological capital contains four characteristics. When the four characteristics are combined, individuals will be able to grow and develop more positively as a result (Bea and Chang, 2015). Based on the ecological systems theory, the growth and development of an individual are actively connected with the surrounding environment. Additionally, the study found that close

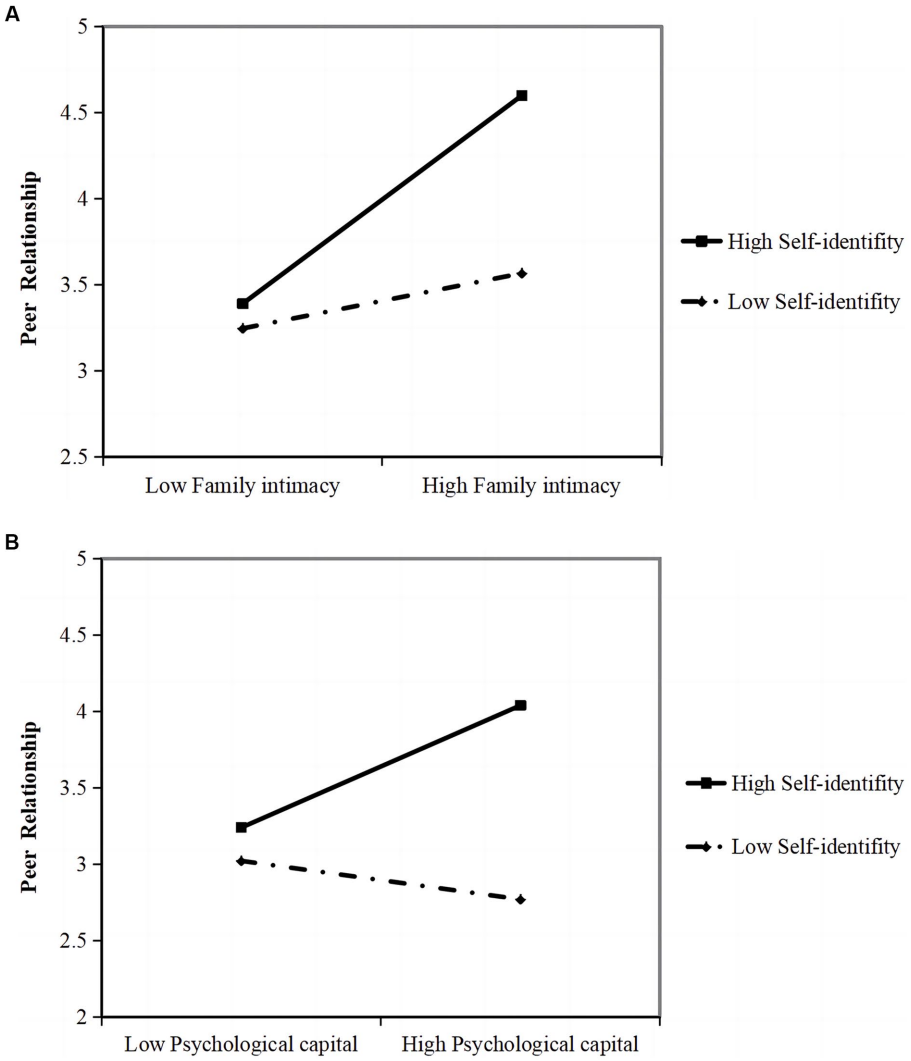

FIGURE 2
(A) Moderating effect of self-identity on relationships between family intimacy and adolescent peer relationships. **(B)** Moderating effect of self-identity on relationships between psychological capital and adolescent peer relationships.

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TABLE 8 Robustness analysis.

Effect	Point estimate	Product of coefficients	Confidence interval 95%				
			Bias-Corrected			Percentile	
		SE	*Z*	Lower	Upper	Lower	Upper
Indirect effect	0.107	0.038	2.186	0.039	0.189	0.037	0.188
Direct effect	0.424	0.079	5.367	0.270	0.583	0.265	0.579
Total effect	0.531	0.070	7.586	0.394	0.671	0.394	0.671

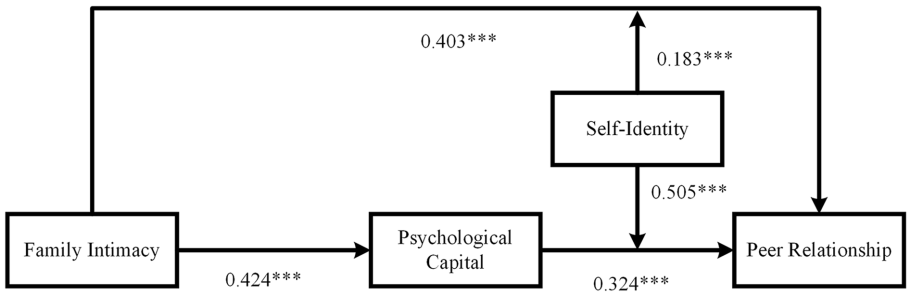

FIGURE 3
Full model path analysis results.

family intimacy can enhance adolescents' psychological safety and stability, strengthen the connection between adolescents and the surrounding environment, and thus enhance adolescents' psychological capital. Furthermore, psychological capital plays a partial mediating role in family intimacy and adolescent peer relationships, indicating that there are other mechanisms for the impact of family intimacy on adolescent peer relationships.

The third finding is that the moderating effect of self-identity was also examined in this study. Although family intimacy can enhance adolescents' levels of adolescent peer relationships by providing a supportive environment, the magnitude of its effect is usually moderated by personal situations, like self-identity. Individuals with different levels of self-identity have different interpretations of family intimacy; Individuals with high self-identity tend to interpret family Intimacy in a positive way compared to individuals with low self-identity (Dugarova et al., 2020). Self-identity is a positive individual difference and it can mitigate the impact of an adverse environment on psychological capital, which is indirectly verified by the research results.

6.2. Managerial implications

According to the research results, this study makes some useful suggestions for Chinese, American, and British parents. Suggestions for Chinese parents are as follows: First, parents need to improve parenting styles, create positive emotional relationships, and create a warm family atmosphere. For example, parents should strengthen their correct understanding of family intimacy through schools, communities, and other platforms to strengthen emotional connections between teenagers and family members, so that teenagers can face life with a positive attitude (Shek, 2002). Parents should actively communicate with their children to enhance intimacy among family members. Second, parents should pay attention to caring about their children's emotional state and guide their children's cognitive growth. Kerr et al. (2012) indicated that the behavioral control, emotional needs, responsiveness, and social adaptability formed during the growth and development of adolescents are conducive to the smooth establishment of personal peer relationships. Parents should care about their children's emotional and psychological needs, recognize their children and enhance their positive psychological capital level. Parents should provide their children with active and effective parent–child communication, create a favorable environment suitable for healthy psychological development, and increase their children's cognitive resources. Finally, parents should create a warm family atmosphere, which is conducive to the establishment of children's sense of belonging to the family. Parents should strengthen family emotional bonds, provide emotional support for their children, and communicate with them sincerely and equally. It will lead children to have greater extroversion and stability in the face of stress.

Suggestions for British and American parents are as follows: First, during adolescence, children should be encouraged to establish positive peer relationships, which is conducive to the establishment of adolescents' independence and autonomy, as well as their self-esteem and healthy social emotions (Reed and Trumbo, 2020). Second, parents should support adolescents peer interactions. Peer relationships in adolescence are more prominent. Adolescents' lack of friends and normal beneficial relationships may lead to increased depression and decreased sense of self-worth (Long et al., 2020). Third, parents should provide their children with love and care, help them establish peer relationships during adolescence, and promote their integration into peer groups, which will help children avoid being troubled by school bullying and isolation. Fourth, parents should value their children and become a person that young people can trust and rely on. On the one hand, this can give adolescents the confidence to talk about their stress and troubles and enable young people to be able to regulate their own stress and negative emotions. On the other hand, it can promote the establishment of adolescents' positive cognition (Noret et al., 2020).

Due to cultural differences in different countries, family intimacy, and adolescent peer relationships will be different. It is meaningful and necessary to explore more in-depth in combination with cultural backgrounds.

6.3. Limitations and future research

Further studies need to be conducted on some limiting factors in this study. First, the measurement of family intimacy in this study only considered the perception of family intimacy by adolescents themselves and did not measure the perception of family intimacy from the perspective of parents. A multilayer model will be constructed for further discussion in future research. Second, this study only considered cross-sectional data and did not consider that adolescents' cognition will change with age, and continuous tracking can be done in future research. Furthermore, this study did not involve control variables such as different management models of schools, or management methods of head teachers (counselors). In future research, the effects of these control variables should be further investigated by conducting comparative studies between different groups. This study mainly explores the linear relationship between variables, the non-linear relationship between variables is an important direction of future research.

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 author.

Ethics statement

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

Author contributions

XZ and KT developed the conceptual framework, did the data analysis, and wrote the manuscript of the paper. XZ, SQ, and JH collected the data. KT analyzed the data. KT, XZ, SQ, JH, and YN revised the manuscript. All authors contributed to the article and agreed on the final version.

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.

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Supplementary material

The Supplementary material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/fpsyg.2023.1165830/full#supplementary-material

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Supportive parent-adolescent relationships as a foundation for adolescent emotion regulation and adjustment

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Introduction: The purpose of this investigation was to examine the influence of supportive parent-adolescent relationships on adolescent adjustment (i.e., prosocial behavior, aggression, depressive symptoms) both directly and indirectly (*via* adolescent emotion regulation). Scholars have posited that adolescent emotion regulation (ER) may serve as an underlying mechanism in the link between parenting and adolescent adjustment. Supportive parent-adolescent relationships (i.e., openness, acceptance, emotional responsiveness) may be a key emotion socialization mechanism influencing adolescent ER.

Methods: The sample included 206 adolescents (Age Range= 10–18years; 51% female; 70.4% ethnic minorities) and one primary caregiver (83.3% biological mothers, 38.7% single parents). Structural equation modeling (SEM) was implemented to investigate the direct and indirect (*via* adolescent ER) effects of supportive parent-adolescent relationships on adolescent adjustment. We also explored whether these indirect and direct effects varied by adolescent sex and age.

Results: Results suggested direct and indirect (*via* adolescent ER) links between supportive parent-adolescent relationships and adolescent prosocial behavior, aggressive behavior, and depressive symptoms. Moreover, evidence indicated that many of these pathways were significant for boys but not girls. No evidence of youth age as a moderator was found.

Discussion: These findings highlight the important role supportive parent-adolescent relationships play in adolescent emotional and behavioral adjustment. Parenting programs could focus on facilitating a mutually responsive parent-adolescent relationship with a specific focus on the dynamic nature of emotion socialization during adolescence.

KEYWORDS

parent-adolescent relationship, depressive symptoms, emotion regulation, prosocial behavior, aggressive behavior

1. Introduction

Intense and labile emotional experiences are often a key characteristic of adolescence (Silk et al., 2003). The development of emotion regulation (ER), or the ability to recognize and regulate one's emotions, plays an important role in adolescent adjustment. For example, difficulty regulating negative emotions can influence the development of various forms of adolescent

psychopathology including both internalizing and externalizing issues (Heleniak et al., 2016; Compas et al., 2017). Further, a more supportive parent-adolescent relationship may contribute to the development of more effective adolescent ER skills which, in turn, may promote positive adolescent development (e.g., prosocial behavior). In contrast, an emotionally unsupportive parent-adolescent relationship may undermine optimal development of ER skills, resulting in adolescent maladjustment (e.g., internalizing and externalizing issues; Branje et al., 2008; Cui et al., 2020).

Studies of parental influences on child adjustment can be categorized into three conceptual models: (1) parent-driven effects focusing on parent behavior; (2) child-driven effects recognizing the influence of child characteristics on parent behavior; and (3) relationship models based on the notion that parent–child relationships are comprised of more than both the parent's and child's behaviors (Laursen and Collins, 2009; Lougheed, 2020). Relationship models capture the dyadic nature of the parent-adolescent relationship and suggest that they are important contexts for socialization during adolescence. Moreover, as the parent–child relationship changes to accommodate increases in adolescent autonomy and decision-making (Lougheed, 2019), examining parent-adolescent interactions at the dyadic-level offers insight into the mechanisms linking parenting behaviors to adolescent adjustment. The current study sought to test both the direct and indirect (*via* adolescent ER) effects of dyadic, supportive parent-adolescent relationships on positive and negative developmental outcomes among youth in a predominantly low-income, single-parent, and ethnic minority sample.

ER provides a critical link to understanding developmental psychopathology during adolescence - a period marked by dramatic increases in mental health issues such as depression and anxiety (Young et al., 2019). Rutherford et al. (2015) postulate that ER plays a role in every aspect of human functioning, including mental and physical health, and the formation and maintenance of relationships with others. Emotion dysregulation, specifically dysregulation of sadness and anger, is a feature of both internalizing and externalizing disorders (Zeman et al., 2002; Beauchaine and Cicchetti, 2019). Some researchers have proposed an emotion specificity hypothesis in which children with externalizing problems may display more anger and have difficulty regulating anger, and others with internalizing problems may display more sadness and have difficulty regulating sadness (Zeman et al., 2002; Te Brinke et al., 2021). Further, adolescents who employ effective ER strategies are more likely to use effective social skills, engage in greater prosocial behaviors, and exhibit fewer problem behaviors (Rutherford et al., 2015).

Morris et al. (2007) developed the tripartite model of ER which posits that ER strategies develop through observation of parents' own regulation strategies, parental emotion guidance and coaching, and the emotional climate of the family. Studies have documented the associations between emotion-related parenting and child ER development, supporting the notion that the development of ER occurs within the context of the family and more specifically, the parent-adolescent relationship (Morris et al., 2018). For example, Cui et al. (2020) found supportive parent emotion socialization practices predicted increases in ER abilities in low-income adolescent females whereas unsupportive practices predicted greater internalizing issues over time. Importantly, previous studies have found adolescents from low-income families are at a greater risk for ER difficulties (Steinberg et al., 2006; Breslau et al., 2017) with evidence suggesting this may be due in part to parenting styles characterized by high levels of intrusiveness and control (O'Neal and Magai, 2005; Consedine et al., 2012). Thus, investigating the role of the parent-adolescent relationship as an ER context, may be particularly important for understanding adjustment outcomes in this population.

Supportive relationships between parents and adolescents are characterized by openness, acceptance, and emotional responsiveness (Criss et al., 2016). In the following paragraphs, we review findings related to each of these elements of supportive parent-adolescent relationships. Parent–child openness, which concerns both parent and child's open communication about emotional needs, reflects the degree of warmth and responsiveness in the relationship. Research has shown that parent-adolescent openness and feelings of emotional connectedness were significantly and positively related to prosocial behaviors (Kapetanovic et al., 2019). Similarly, research has demonstrated that parent-adolescent communication styles characterized by high levels of open and clear communication and empathetic responsiveness were related to mutually supportive parent-adolescent relationships (Seiffge-Krenke and Pakalniskiene, 2011) and fewer adolescent ER difficulties and depressive symptoms (Brenning et al., 2015). Acceptance in the parent–child relationship reflects the degree to which parents show supportive, accepting, and emotionally responsive behavior. Parental acceptance is associated with greater psychological adjustment (Dwairy, 2010) and emotional stability (Mendo-Lázaro et al., 2019) in adolescence. Thus, openness and acceptance may support parent-adolescent interactions that are more conducive to communication, adolescent disclosure, and emotional responsiveness (Morris et al., 2018).

The capacity for emotional responsiveness, a component of supportive parent-adolescent relationships, is defined as the awareness and responsivity to another's emotions during social exchanges (Feldman et al., 2013). Research suggests that these experiences, characterized by equitable give-and-take, are particularly important for social and emotional outcomes during childhood and adolescence. Studies have found that high levels of emotional responsiveness during parent-adolescent interactions were significantly associated with high levels of feelings of closeness to parents and peers (Laursen et al., 2000; Mastrotheodoros et al., 2019) and adolescent dialogical skills (i.e., the capacity for perspective-taking and empathy) during other social interactions (Feldman et al., 2013). Silk et al. (2007) found, among early adolescent boys in low-income families, maternal acceptance and emotional responsivity predicted lower levels of internalizing issues. Notably, the protective effects of the parent-adolescent relationship were attenuated among adolescents with higher exposure to neighborhood risk, suggesting that the buffering effects of family contextual factors may be limited in particularly high-risk environments. In contrast, parent-adolescent interactions lacking emotional responsiveness may contribute to adolescent emotion dysregulation and increased risk for adolescent psychopathology. Studies have shown low levels of parent–child emotional responsiveness are significantly related to high levels of adolescent emotion dysregulation and depressive symptoms (Yap et al., 2010; Van Lissa et al., 2019). Taken together, these findings suggest the three factors comprising supportive parent-adolescent relationships. Openness, acceptance, and emotional responsiveness, may work in tandem to influence adolescent ER and subsequent adjustment outcomes.

Associations between supportive parent-adolescent relationships, ER, and adolescent outcomes may differ by sex and age. Some studies have found the link between parental emotional support and adolescent externalizing symptoms is stronger among girls (de Kemp et al., 2007); whereas other studies have found no sex differences in the link between parental emotional support and acceptance and adolescent externalizing symptoms (Garthe et al., 2018). Moreover, evidence in the literature has demonstrated age differences in the link between parenting and adjustment. For instance, Helsen et al. (2000) found parental emotional support was more strongly related to internalizing symptoms among younger adolescents compared to older youth. Another study found no age differences in the link between parental support and adolescent internalizing symptoms (Meadows et al., 2006). Additional research is needed to further elucidate the moderating role of age and sex among these associations.

Previous studies have explored ER as a mediator in the link between parenting characteristics and adolescent adjustment (e.g., Weissman et al., 2019; Perry et al., 2020). While these studies have added to our understanding of this literature, some gaps remain. First, few studies have focused on adolescent ER as the mechanism linking supportive relationships between parents and adolescents and adolescent adjustment. Further, we examined supportive parent-adolescent relationships as a latent construct using multi-method, multi-informant approaches. The use of observational and self-report data from both parent and adolescent to examine relational constructs such as acceptance, openness, and emotional responsiveness adds to a growing literature that captures the dyadic and increasingly egalitarian interactions between parents and adolescents. Second, there is limited research investigating ER as a mediator in the relationship between indicators of parent-adolescent relationship quality and adjustment outcomes in low-income, single-parent, and ethnic minority samples. Given past research suggesting adolescents from low-income families are at increased risk for ER difficulties (Steinberg et al., 2006; Breslau et al., 2017), it is particularly important to explore how ER may influence these relationships. Lastly, there have been few published investigations examining whether these associations vary by adolescent age and gender. In the current study, we addressed these gaps by first examining direct and indirect (*via* adolescent anger and sadness regulation) links between supportive parent-adolescent relationships and adolescent adjustment (i.e., prosocial behavior, depressive symptoms, and aggressive behavior) in a predominantly low-income, single parent, ethnic minority sample. It was hypothesized that supportive parent-adolescent relationships would be directly and indirectly (*via* adolescent anger and sadness regulation) related to adolescent adjustment. In addition, we explored whether these pathways were moderated by adolescent age and sex. No specific hypotheses regarding sex and age differences were made, as previous research findings related to these factors were inconclusive.

2. Materials and methods

2.1. Participants

The sample consisted of 206 families with adolescents who participated in the Family and Youth Development Project (FYDP; citation withheld for masked review). The purpose of the FYDP was to examine predictors and outcomes of adolescent ER. Data were collected from urban areas of a southern Midwest region of the United States from both adolescents (*M* age = 13.38 years, SD = 2.32, Age Range = 10–18 years; 51% female; 32% African American, 29.6% European American, 19.4% Latino American, 19% multiple racial/ethnic groups) and their primary caregivers (83.3% biological mothers, 10.7% biological fathers, 2% grandparents, 4% other). The sample was predominantly comprised of low-income (*Median* annual income = $40,000, 47.5% of families were receiving welfare or public assistance) families with an average of 4.35 people living in each home and 38.7% headed by single parents.

2.2. Procedures and measures

Families were recruited through fliers and convenience snowball sampling methods. Participants were asked to come to a university laboratory to participate in the study. Following the IRB protocol, the purpose and procedure of the study were explained to adolescents and their primary caregivers before they signed consent and assent forms. Following the assent/consent process, parents and adolescents were separated to complete questionnaires assessing parenting and adjustment. After completing the questionnaires, parents and adolescents were brought together to participate in an emotion-eliciting conflict resolution task which asked dyads to discuss their most frequent conflicts. Interactions were videotaped for later coding. The laboratory assessment lasted 2 h on average. Parents and adolescents received financial compensation for their time spent in the lab.

2.2.1. Parental acceptance

Adolescents completed the parental acceptance scale which assesses the degree to which the parent displays supportive, accepting, and emotionally responsive behavior when interacting with the adolescent (Schaefer, 1965). The parental acceptance scale is a 10-item Likert scale ranging from 1 (*not like her/him*) to 3 (*a lot like her/him*) and includes items such as "My mother/father is a person who makes me feel better talking over my worries with her/him," and "makes me feel like the most important person in her/his life." Mean scores were calculated with higher scores indicating greater parental acceptance. Cronbach's α was 0.92.

2.2.2. Parent-adolescent openness

Parents and adolescents each reported the extent to which the parent and adolescent have a relationship marked by open communication, support, and emotional responsiveness using a 5-point scale ranging from 1 (*Definitely not*) to 5 (*Definitely*). This instrument was adapted from the Student-Teacher Relationship Scale (Pianta, 2001) and the Adult-Child Relationship Scale (Criss et al., 2003) and included 10 items such as "If upset about something, I would talk with my mother/father about it," and "I liked asking my mother/father about how things were going for her/him." Wording of the items was adjusted for parent-report to assess parent openness with their adolescent; "If I was upset about something, I would tell my child about it," and "I was very open about sharing my feelings and telling my child how things were going." While the ACRS measure focused on parent-to-child behavior, it was modified in the current project to assess both parent-to-adolescent and adolescent-to-parent behavior, making it more of a dyadic measure of parent-adolescent

relationship quality. Mean scores were calculated, with higher scores reflecting greater parent-adolescent openness. Cronbach's αs were 0.92 for adolescent report and 0.84 for parent report.

2.2.3. Observed parent-adolescent relationship quality

Parent-adolescent relationship quality was assessed during the 6-min conflict resolution task which asked dyads to discuss their top 5 most frequent conflicts identified using the modified Conflict Frequency Scale (Melby et al., 1998). Both parents and adolescents completed the 33-item questionnaire prior to the task which consists of possible conflict topics including but not limited to, "Attitude/respect," "Chores at home," and "Homework." Parents and adolescents rated how frequently in the past year they had each conflict on a 5-point Likert scale from "Never" to "Very Often." The 5 topics rated most frequent by the dyad were selected for use in the conflict resolution task.

Interactions during the task were coded using a revised coding scheme developed originally by Rand Conger and his colleagues (Melby et al., 1998). Research assistants rated the quality of the parent-adolescent relationship on a 9-point scale. A low score indicates an unhappy, emotionally unsatisfying, or brittle relationship and reflects low levels of relationship quality between parent and adolescent. A high score indicates a warm, open, happy, and emotionally responsive relationship and reflects high levels of relationship quality. Evidence of good communication, humor, responsiveness, positive responses to the other's verbalizations, warmth, and awareness of the other person's life and daily activities are considered as indicators of good relationship quality. Evidence of hostility, intrusiveness, lecturing or moralizing (usually the parent), constraining verbal expression, inducing guilt, or invalidating feelings are considered indicators of poor relationship quality. Based on 20% of the videos coded twice, interrater reliability for parent-adolescent relationship quality was assessed using intraclass correlations ($\rho = 0.71$, $p < 0.001$).

2.2.4. Adolescent emotion regulation

Parents and adolescents each reported on adolescents' abilities to regulate their emotions using the Children's Emotion Management Scale: Sadness and Anger scales (CSMS; Zeman et al., 2001). The sadness and anger coping subscales were used as indicators of adolescent ER. The sadness coping subscale included five items such as "I try to calmly deal with what is making me sad." One item ("When I am sad, I do something totally different until I calm down") was discarded to improve reliability (final Cronbach's α was 0.61 for adolescent report, and 0.60 for parent report). The anger coping subscale included four items such as "I stay calm and keep cool when I'm feeling mad." Cronbach's α was 0.74 for adolescent report, 0.79 for parent report. Wording of these items was modified for parent report of adolescent ER. The scale ranged from 0 (*Not true*) to 2 (*Very true*). Means scores were calculated for both subscales, with higher scores indicating greater emotion coping strategies.

2.2.5. Adolescent prosocial behavior

Parents and adolescents each reported on adolescents' prosocial behavior during the past year on a 3-point scale from 0 (*Not true*), 1 (*Sometimes*), to 2 (*True*). This measure (from the Strengths and Difficulties Questionnaires, SDQ, Goodman and Scott, 1999) included 5 items such as "I try to be nice to other people," and "I care about their feelings." Mean scores were calculated, with higher scores reflecting greater prosocial behavior. Cronbach's α was 0.81 for adolescent-report and 0.70 for parent-report. A composite score was calculated based on the average ($r = 0.25$, $p < 0.001$) of adolescent and parent ratings.

2.2.6. Adolescent aggressive behavior

Parents and adolescents each reported on adolescents' aggressive behavior using 14 items from the Problem Behavior Frequency Scale (Farrell et al., 2000), which assessed the frequency of physical, relational, and verbal aggression. Example items include: "Get in a fight in which someone was hit," "Spread a rumor," and "Insult someone's family." Both parents and adolescents were asked to indicate how frequently the adolescents engaged in each behavior during the past year using the following scale ranging from 1 (*Never*), 2 (*1–2 times*), 3 (*3–4 times*), 4 (*5–6 times*), to 5 (*7 or more times*). Mean scores were calculated, with higher scores reflecting greater aggressive behavior. Cronbach's α was 0.88 for adolescent report and 0.90 for parent report. The adolescent and parent ratings were averaged ($r = 0.38$, $p < 0.001$) to create the adolescent aggressive behavior composite score.

2.2.7. Adolescent depressive symptoms

Adolescents reported on their own depressive symptoms during the last 2 weeks using the Child Mood & Feelings Questionnaire (MFQ-C, Angold and Costello, 1987) using a 3-point scale ranging from 0 (*Not true*), 1 (*Sometimes*), to 2 (*True*). This measure includes 33 items such as "I felt miserable or unhappy," and "I thought there was nothing for me in the future." Cronbach's α was 0.93 and scores were averaged with higher scores indicating greater depressive symptoms.

3. Results

3.1. Analytical plan

First, mean sex and age group differences on study variables were tested using *t*-tests. To answer our research question, structural equation modeling (SEM) was implemented to test the theoretical models using *M*plus version 6.12 (Muthén and Muthén, 2012). Parental acceptance, both parent and adolescent-reports of parent-adolescent openness and observed parent-adolescent relationship quality were used as four indicators of supportive parent-adolescent relationships. Parent-report and adolescent-report of sadness or anger regulation were two indicators for the sadness or anger regulation latent construct, respectively. Anger and sadness regulation were examined in separate models. Using the classic two-step modeling procedure (Anderson and Gerbing, 1988), measurement models of the latent variables were tested and modified first, followed by the structural models used to test the hypothesized theoretical associations. The chi-square test of fit was supplemented with the comparative fit index (CFI > 0.95) and the root mean square error of approximation (RMSEA <0.06, Hu and Bentler, 1999). Indirect effects of supportive parent-adolescent relationships on outcome variables through anger or sadness regulation were estimated, and bootstrapping

was used to estimate the standard errors and 95% bias-corrected confidence intervals of the coefficients in *M*plus. Finally, multi-group analysis in *M*plus was conducted to examine sex and age differences in the associations. A median split was used to create two age groups (ages 10–13, 50.5% vs. 14–18, 49.5%) based on early and middle age ranges of adolescence put forth by the American Academy of Pediatrics (Allen and Waterman, 2019). Factor loadings of the observed variables and variances of the latent factors were constrained to be equal across groups to examine measurement invariance. Next, constraints were placed on all path coefficients in the structural models and individually relaxed based on theory and improvement in model fit based on chi-square difference ($\Delta\chi^2$) test.

3.2. Descriptive analyses

Adolescent females reported greater openness with their parents compared to adolescent males, t (204) = 3.02, $p < 0.01$ and were rated to have higher parent-adolescent relationship quality than adolescent males, t (197) = 2.27, $p = 0.02$. Parents reported adolescent females to have higher scores on anger regulation than males, t (202) = 2.18, $p = 0.03$. Both adolescent-reports and parent-reports indicated females had higher levels of prosocial behavior than males, t (196.84) = 4.29, $p < 0.001$, and t (191.80) = 2.76, $p < 0.01$, respectively. Adolescent males reported slightly more aggressive behavior than females, t (204) = −1.99, $p < 0.05$. Depressive symptoms did not differ by sex, t (203) = −0.69, $p = 0.49$.

Younger adolescents reported greater parental acceptance, and openness than older adolescents, t (199.59) = 3.53, $p = 0.001$, and t (204) = 2.28, $p = 0.02$, respectively. Younger adolescents also were rated to have higher relationship quality with parents, t (197) = 2.22, $p = 0.03$, and rated by parents to have higher levels of openness and prosocial behavior, t (202) = 2.38, $p = 0.02$, and t (202) = 2.24, $p = 0.03$, respectively. Younger adolescents reported marginally fewer depressive symptoms, t (203) = −1.86, $p = 0.06$. No age differences in ER or aggressive behavior were found. Descriptive statistics for all variables for the full sample and by age and sex can be found in Table 1. Correlations among all study variables are presented in Table 2.

3.3. Indirect effect models for the full sample

3.3.1. Anger regulation model

The measurement model was tested first. Based on modification indices, adolescent report of openness and parental acceptance were permitted to correlate with each other. The final measurement model fit the data well, χ^2 (7) = 7.05, $p = 0.42$; CFI = 1.00; RMSEA = 0.01. Analysis of the structural model fit the data very well, χ^2 (19) = 32.15, $p = 0.03$; CFI = 0.97; RMSEA = 0.06. Supportive parent-adolescent relationships were positively associated with anger regulation, which in turn was positively associated with adolescent prosocial behavior and negatively associated with adolescent aggressive behavior and depressive symptoms (Figure 1). The direct link between supportive parent-adolescent relationships and prosocial behavior was significant. All indirect effects of supportive parent-adolescent relationships on the three adjustment outcomes through anger regulation were significant (Table 3). Thus, supportive parent-adolescent relationships were directly and indirectly related to adolescent prosocial behavior; in contrast, supportive parent-adolescent relationships were indirectly (but not directly) related to adolescent aggression and depressive symptoms.

3.3.2. Sadness regulation model

The final measurement model fit the data well, χ^2 (7) = 3.41, $p = 0.84$; CFI = 1.00; RMSEA = 0.00. Analysis of the structural model fit the data very well, χ^2 (19) = 25.01, $p = 0.16$; CFI = 0.98; RMSEA = 0.04. Supportive parent-adolescent relationships were positively associated with sadness regulation, which in turn was positively associated with adolescent prosocial behavior and negatively associated with adolescent aggressive behavior but not significantly associated with depressive symptoms (Figure 2). The direct links between supportive parent-adolescent relationships and prosocial behavior and aggression were significant. The indirect effects of supportive parent-adolescent relationships on adolescent prosocial and aggressive behavior through sadness regulation were significant, while the indirect effect on depressive symptoms through sadness regulation was not significant (Table 3). Thus, supportive parent-adolescent relationships were directly and indirectly related to adolescent prosocial behavior and aggression, but supportive parent-adolescent relationships were not significantly related (directly or indirectly) to adolescent depressive symptoms in this model.

3.4. Moderation by adolescent sex

The multi-group measurement model was fit to the data first. The modification indices suggested that only the intercepts for parental acceptance and adolescent report of openness varied by sex, i.e., the intercept of parental acceptance was slightly higher among males, and the intercept of openness was higher among females. The final measurement model fit the data well, χ^2 (29) = 26.01, $p = 0.63$; CFI = 1.00; RMSEA = 0.00 for anger regulation model, and χ^2 (29) = 20.92, $p = 0.86$; CFI = 1.00; RMSEA = 0.00 for sadness regulation model.

3.4.1. Anger regulation model

All the path coefficients in the structural model were then constrained to be equal across sexes. The modification indices suggested that the link between supportive parent-adolescent relationships and adolescent aggressive behavior should be freely estimated, and the new model fit the data better than the fully constrained model, $\Delta\chi^2$ (1) = 7.35, $p < 0.01$, with the model fit, χ^2 (59) = 80.69, $p = 0.03$; CFI = 0.96; RMSEA = 0.06. Results suggested that the association between supportive parent-adolescent relationships and adolescent aggressive behavior was marginally significant for males and was not significant for females (Figure 1).

3.4.2. Sadness regulation model

All of the path coefficients in the structural model were constrained to be equal across sexes. The modification indices suggested that the link between supportive parent-adolescent relationships and adolescent aggressive behavior should be freely

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TABLE 1 Descriptive statistics.

Variables	Full Sample (N = 206)	Females (n = 105)	Males (n = 101)	Younger (n = 104)	Older (n = 102)
Adolescent age	13.38 (2.32)	13.39 (2.36)	13.37 (2.29)	11.37 (1.08)	15.44 (1.06)
Adolescent sex	51% female	–	–	50% female	52% female
Supportive Parent-Adolescent Relationship					
Parental Acceptance (A)	2.51 (0.51)	2.53 (0.52)	2.48 (0.49)	2.63 (0.46)	2.38 (0.52)
Relationship Quality (O)	4.71 (2.63)	5.12 (2.70)	4.28 (2.53)	5.11 (2.64)	4.29 (2.59)
Openness (A)	3.61 (0.97)	3.81 (0.99)	3.41 (0.91)	3.76 (0.92)	3.46 (1.00)
Openness (P)	4.07 (0.63)	4.11 (0.61)	4.02 (0.66)	4.17 (0.56)	3.96 (0.69)
Emotion Regulation					
Anger Regulation (A)	1.19 (0.52)	1.20 (0.52)	1.18 (0.52)	1.21 (0.54)	1.17 (0.50)
Sadness Regulation (A)	1.32 (0.49)	1.33 (0.48)	1.30 (0.50)	1.29 (0.52)	1.34 (0.45)
Anger Regulation (P)	1.00 (0.51)	1.07 (0.48)	0.91 (0.52)	1.01 (0.49)	0.98 (0.52)
Sadness Regulation (P)	1.08 (44)	1.05 (0.44)	1.11 (0.44)	1.06 (0.44)	1.09 (0.45)
Outcome Variables					
Prosocial (A)	1.57 (0.43)	1.69 (0.38)	1.45 (0.44)	1.61 (0.43)	1.53 (0.43)
Prosocial (P)	1.63 (0.36)	1.70 (0.32)	1.56 (0.38)	1.69 (0.33)	1.58 (0.38)
Depressive (A)	0.37 (0.33)	0.36 (0.34)	0.39 (0.33)	0.33 (0.30)	0.42 (0.36)
Aggression (A)	1.43 (0.52)	1.36 (0.50)	1.51 (0.53)	1.37 (0.51)	1.50 (0.52)
Aggression (P)	1.55 (0.62)	1.49 (0.53)	1.61 (0.71)	1.55 (0.60)	1.55 (0.65)

Means and standard deviations (in parentheses); A, adolescent reports; P, parent reports; O, observer rating.

estimated, and the new model fit the data better than the fully constrained model, $\Delta\chi^2$ (1) = 8.45, $p < 0.01$. After releasing this link, the modification indices for the new model suggested that the link between supportive parent-adolescent relationships and sadness regulation should also be freely estimated, and the final model fit the data better, χ^2 (58) = 60.13, $p = 0.40$; CFI = 1.00; RMSEA = 0.02, than the previous model, $\Delta\chi^2$ (1) = 6.50, $p < 0.05$. The results suggested the association between supportive parent-adolescent relationships and adolescent sadness regulation was significant for males but not for females, and the association between supportive parent-adolescent relationships and aggressive behavior was also significant for males but not for females. Bootstrapping results showed that the indirect effects of supportive parent-adolescent relationships on prosocial and aggressive behavior were only significant for males (Table 3). In other words, supportive parent-adolescent relationships were directly and indirectly related to aggression for males but not females. None of the indirect effects were significant for females due to the non-significant link between supportive parent-adolescent relationships and sadness regulation.

3.5. Moderation by adolescent age

The multi-group measurement models fit the data well, χ^2 (31) = 28.79, $p = 0.58$; CFI = 1.00; RMSEA = 0.00 for anger regulation model, and χ^2 (31) = 20.48, $p = 0.93$; CFI = 1.00; RMSEA = 0.00 for sadness regulation model. All the path coefficients in the structural model were constrained to be equal at first. The fully constrained models fit the data well, χ^2 (62) = 67.28, $p = 0.30$; CFI = 0.99; RMSEA = 0.03 for anger model, and χ^2 (62) = 50.71, $p = 0.85$; CFI = 1.00; RMSEA = 0.00 for sadness model. The modification indices did not show meaningful constraint releasing suggestions. Thus, there were no significant age differences among the links.4. Discussion

The current study extended the literature by examining direct and indirect (*via* adolescent sadness and anger regulation) links between supportive parent-adolescent relationships and adolescent adjustment (i.e., prosocial behavior, aggression, depressive symptoms) using a predominantly low-income, single-parent, and ethnic minority sample. Results suggested that ER may serve as one mechanism underlying the association between supportive parent-adolescent relationships and adolescent adjustment outcomes. Specifically, as hypothesized, this study found the effects of supportive parent-adolescent relationships on adolescent depression, aggression, and prosocial behavior were indirect through adolescent ER. Further, we found direct links between supportive parent-adolescent relationships and adolescent prosocial behavior and aggression but not depression. The analyses also showed that adolescent sex (but not age) served as a moderator in some of the pathways.

Parent-adolescent relationships characterized by high levels of parental acceptance and parent-adolescent openness and emotional responsiveness during interactions may help facilitate self-regulatory skills. Providing an environment for these self-regulatory skills to develop may lead to communion (connectedness or relatedness) and agency (independence or self-determination) in children and adolescents (Baumrind, 2013) while also fostering optimal cognitive and social competencies (Criss et al., 2003). Parent-adolescent relationships with high levels of emotional support may be more conducive to adolescent negative emotional expressions facilitating opportunities for supportive emotion socialization behaviors (Morris

TABLE 2 Bivariate correlations.

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. Adolescent age	–														
2. Adolescent sex[a]	−0.01	–													
S-PAR															
3. Parental acceptance (A)	−0.26***	−0.06	–												
4. Relationship quality (O)	−0.15*	−0.16*	0.35***	–											
5. Openness (A)	−0.20**	−0.21**	0.63***	0.28***	–										
6. Openness (P)	−0.12	−0.07	0.43***	0.29***	0.39***	–									
Emotion regulation															
7. AR (A)	−0.03	−0.02	0.24**	0.29***	0.30***	0.28***	–								
8. SR (A)	0.05	−0.03	0.18*	0.10	0.12	0.15*	0.42***	–							
9. AR (P)	−0.04	−0.15*	0.17*	0.23**	0.19**	0.21**	0.36***	0.18*	–						
10. SR (P)	0.03	0.08	0.18*	0.18*	0.13	0.21**	0.30***	0.25***	0.57***	–					
Outcome variables															
11. Prosocial (A)	−0.06	−0.29***	0.36***	0.17*	0.40***	0.31***	0.45***	0.30***	0.24***	0.21**	–				
12. Prosocial (P)	−0.15*	−0.19**	0.25***	0.32***	0.14*	0.40***	0.28***	0.19**	0.31***	0.31***	0.25***	–			
13. Depressive symptoms (A)	0.15*	0.05	−0.23**	−0.22**	−0.24**	−0.09	−0.34***	−0.14*	−0.22**	−0.16*	−0.03	−0.19**	–		
14. Aggression (A)	0.18**	0.14*	−0.29***	−0.32***	−0.22**	−0.24**	−0.43***	−0.20**	−0.34***	−0.18*	−0.28***	−0.29***	0.42***	–	
15. Aggression (P)	0.03	0.09	−0.23**	−0.27***	−0.13	−0.41***	−0.34***	−0.21**	−0.43***	−0.36***	−0.25***	−0.48***	0.17*	0.38***	–

S-PAR, Supportive Parent-adolescent Relationship; (A), adolescent report; (P), parent report; O, observer rating; AR, Anger regulation; SR, Sadness regulation. * $p < 0.05$. ** $p < 0.01$. *** $p < 0.001$. [a]Youth sex was coded as 0 (females) and 1 (males).

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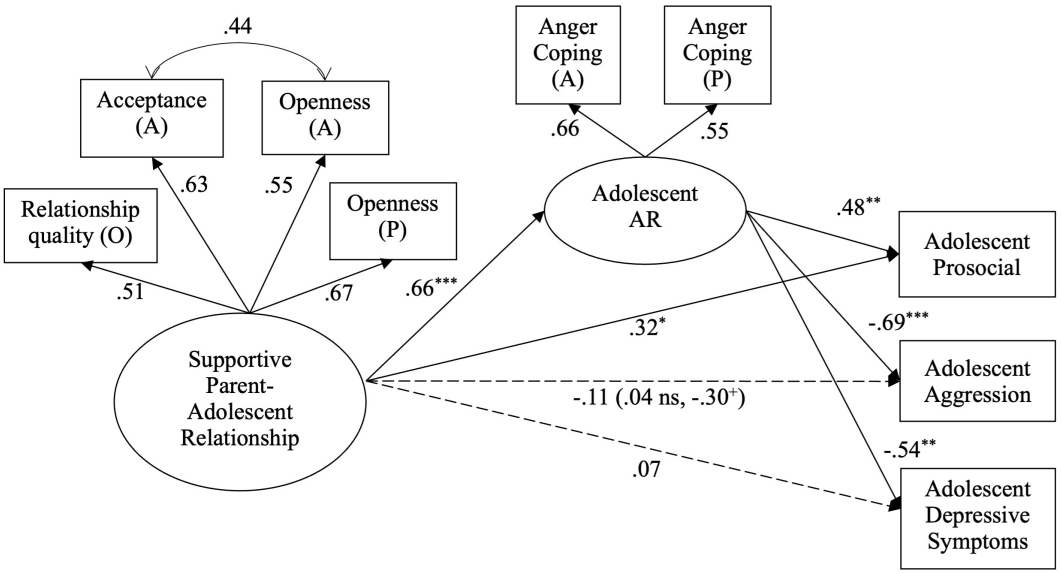

FIGURE 1
The indirect effects of supportive parent-adolescent relationship on adjustment through anger regulation (AR). All estimates are standardized coefficients. Coefficients for both sex groups are in parenthesis, with females' coefficient estimate followed by males'. $^{+}$ $p < 0.10$. * $p < 0.05$. ** $p < 0.01$. A, adolescent reports; P, parent reports; O, observational.

TABLE 3 Bootstrap tests of indirect effect of supportive parent-adolescent relationship through emotion regulation.

	Prosocial behavior		Aggressive behavior		Depressive symptoms	
	Estimate	95% CI	Estimate	95% CI	Estimate	95% CI
Full Sample						
S-PAR *via* AR:						
Direct effects	0.31	[−0.07, 0.69]	−0.16	[−0.69, 0.72]	0.08	[−0.26, 0.83]
Indirect effects	0.31**	[0.14, 0.96]	−0.69**	[−2.02, −0.35]	−0.38**	[−1.33, −0.15]
S-PAR *via* SR:						
Direct effects	0.41	[−0.04, 0.71]	−0.51	[−1.00, 0.22]	−0.18	[−0.49, 0.18]
Indirect effects	0.21**	[0.07, 0.79]	−0.32**	[−1.41, −0.09]	−0.12	[−0.54, 0.04]
Girls						
S-PAR *via* AR:						
Direct effects	0.21	[−0.26, 0.49]	0.06	[−0.53, 0.83]	0.01	[−0.30, 0.63]
Indirect effects	0.34**	[0.17, 0.87]	−0.60**	[−1.74, −0.29]	−0.32**	[−1.18, −0.12]
S-PAR *via* SR:						
Direct effects	0.32	[−0.04, 0.54]	−0.29	[−0.75, 0.27]	−0.19	[−0.52, 0.14]
Indirect effects	0.12	[−0.02, 0.65]	−0.13	[−0.83, 0.01]	−0.05	[−0.54, 0.02]
Boys						
S-PAR *via* AR:						
Direct effects	0.21	[−0.26, 0.49]	−0.47	[−1.14, 0.36]	0.01	[−0.30, 0.63]
Indirect effects	0.34**	[0.17, 0.87]	−0.60**	[−1.74, −0.29]	−0.32**	[−1.18, −0.12]
S-PAR *via* SR:						
Direct effects	0.32	[−0.04, 0.54]	−0.81*	[−1.48, −0.14]	−0.19	[−0.52, 0.14]
Indirect effects	0.35**	[0.15, 0.79]	−0.39*	[−1.19, −0.07]	−0.14	[−0.57, 0.10]

S-PAR, Supportive Parent-adolescent Relationship; AR, Anger regulation; SR, Sadness regulation; CI, Confidence interval. * $p < 0.05$. ** $p < 0.01$. All estimates were unstandardized coefficients.

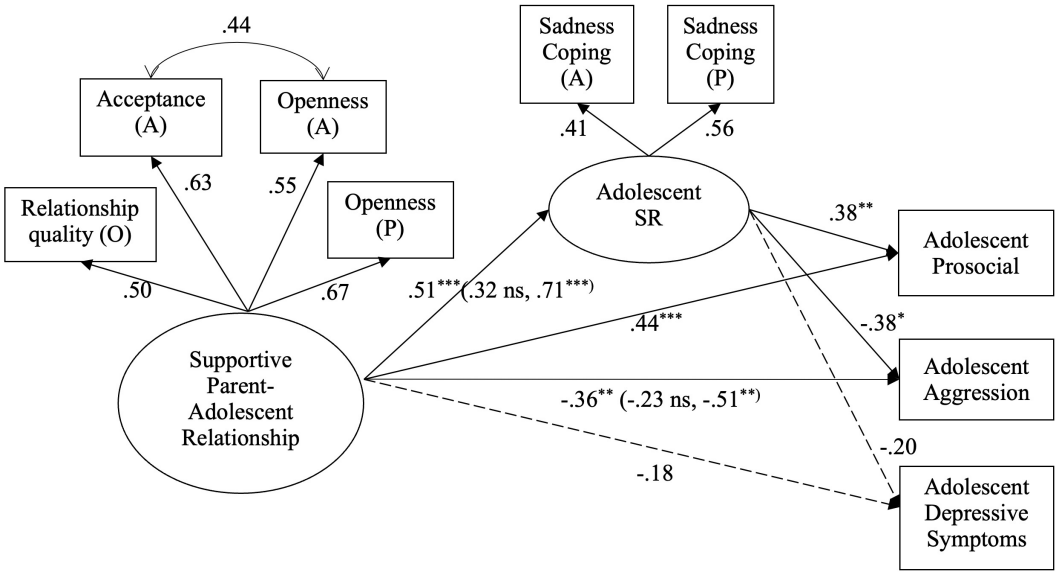

FIGURE 2
The indirect effects of supportive parent-adolescent relationship on adjustment through sadness regulation (SR). All estimates are standardized coefficients. Coefficients for both sex groups are in parentheses, with females' coefficient estimates followed by males'. * $p < 0.05$. ** $p < 0.01$. A, adolescent reports; P, parent reports; O = observational.

et al., 2007). Together, the two models examined demonstrated the critical role supportive parent-adolescent relationships may play as an independent factor in the development of adolescent ER and adjustment outcomes for youth at-risk.

4.1. Anger regulation

In support of the first hypothesis, results of the anger model revealed significant indirect effects, such that greater supportive parent-adolescent relationships were associated with greater adolescent anger regulation, which in turn was related to greater prosocial behaviors and less aggression and depressive symptoms. These findings are consistent with Criss et al. (2016) research which found mutual emotional support, represented by parent-adolescent acceptance and openness, to be both directly related to adolescent anger regulation and indirectly related through emotion coaching. Moreover, additional studies have found parental support, emotion coaching, and family cohesion to be positively related to adolescent anger regulation (e.g., Shortt et al., 2010; Hale et al., 2023), suggesting active emotion socialization efforts continue to play a critical role in adolescence.

Studies examining adolescent anger regulation as a predictor of adolescent outcomes have demonstrated that high levels of anger regulation were significantly related to low levels of adolescent externalizing and internalizing behaviors (Shortt et al., 2010; Otterpohl et al., 2021). In the current study, we found similar patterns in that anger regulation was significantly and negatively related to depressive symptoms while sadness regulation was not. This is consistent with prior longitudinal research indicating anger dysregulation, but not sadness dysregulation, was associated with increased depressive symptoms in a sample of low-income, ethnic minority youth (Folk et al., 2014). However, Rueth et al. (2017) found that adolescent adaptive anger regulation mediated the relationship between parent autonomy support and adolescent externalizing and prosocial behaviors, but not internalizing behaviors. Our findings suggest that anger regulation strategies, developed in the context of emotionally responsive parent-adolescent interactions, may be associated with fewer depressive symptoms, possibly by deterring anger suppression strategies which have been shown to increase adolescent internalizing symptoms (Rueth et al., 2017). Indeed, O'Neal et al. (2017) found parent discouragement of their child's anger significantly predicted increased depressive symptoms during adolescence in a low-income, ethnic minority sample. Results regarding prosocial behavior are consistent with past findings suggesting the ability to regulate one's expression of anger may be associated with prosocial behavior including empathetic concern, perspective-taking, and cooperation during social interactions (Feldman et al., 2013).

Building upon past research, our findings suggest that adolescent anger regulation is an important mechanism through which the latent construct of supportive parent-adolescent relationships is linked to adolescent prosocial behavior, aggression, and depressive symptoms. In relationships characterized by high levels of acceptance and emotional support, parents may be more likely to validate adolescent's negative emotional expressions (specifically anger) and consider these opportunities for supportive emotion socialization practices, such as problem-solving and social support (Criss et al., 2016). In turn, adolescents may be more likely to express, rather than suppress, anger in balanced, emotionally responsive parent-adolescent interactions.

In addition to these indirect effects, a significant direct effect was found between supportive parent-adolescent relationships and

adolescent prosocial behaviors. This is consistent with past research that showed positive, balanced parent-adolescent interactions were positively related to adolescent prosocial behavior (Feldman et al., 2013). Specifically, emotionally supportive relationships may facilitate empathy development and perspective-taking in adolescents through both their perceptions of parent support as well as their emotional support of their parent (Boele et al., 2019). Notably, there was not a direct effect from supportive parent-adolescent relationships to adolescent aggression or depressive symptoms suggesting adolescent anger regulation may be a critical mechanism linking these associations.

4.2. Sadness regulation

Next, we examined whether the links between supportive parent-adolescent relationships and adolescent adjustment were mediated by sadness regulation. Results of the second model revealed significant indirect effects, such that supportive parent-adolescent relationships were positively and significantly associated with adolescent sadness regulation, which in turn was significantly related to prosocial behavior and aggression in expected directions. However, no indirect effect was found in the pathway to adolescent depressive symptoms. Interestingly, our findings do not support the aforementioned emotion specificity hypothesis, as we found anger regulation was associated with depressive symptoms and aggression, whereas sadness regulation was associated with aggression but not depressive symptoms. However, our findings are consistent with prior research suggesting anger regulation is related to both internalizing and externalizing symptoms (Shortt et al., 2010; Otterpohl et al., 2021). As mentioned previously, Folk et al. (2014) found anger dysregulation, but not sadness dysregulation, was associated with greater depressive symptoms in a sample of low-income, ethnic minority youth. While this may seem counterintuitive, across low-income samples, anger regulation is consistently associated with internalizing symptoms above and beyond sadness regulation (e.g., Folk et al., 2014; O'Neal et al., 2017). Moreover, previous research has noted youth difficulties when reporting on sadness regulation (O'Neal et al., 2017) which may contribute to this unexpected finding. It is also possible adolescents may experience more anger than sadness due to environmental factors such as neighborhood disadvantage (Sullivan et al., 2010). Considering the results of our moderation analyses (discussed below), these associations may vary based on sex.

Similar to the first model, a significant direct effect was found between supportive parent-adolescent relationships and greater adolescent prosocial behavior. A significant direct effect was found between greater supportive parent-adolescent relationships and less adolescent aggression; however, this association only remained significant for males following moderation analyses. Overall, anger regulation appeared to play a larger role in the links between supportive parent-adolescent relationships and adjustment outcomes compared to sadness regulation. Perhaps in the context of a low-income sample, parents may focus their energy on facilitating anger regulation given the implications of ineffective anger regulation at home, in one's neighborhood, or at school (Sullivan et al., 2010).

4.3. Sex and age differences

To explore our second research question, we examined whether sex and age moderated the links between supportive parent-adolescent relationships and adolescent adjustment outcomes. In regard to the first model (anger regulation), we found the effect of sex resulted in no changes in the findings aside from a marginally significant direct effect between supportive parent-adolescent relationships and aggression for males compared to a nonsignificant effect for females. Past research suggests parent-adolescent support and openness is associated with less aggressive behaviors for both males and females (Branje et al., 2008), however, in the current study, the inclusion of adolescent ER provides a more nuanced understanding of these associations and points to potential differences based on adolescent sex.

In regard to the second model (sadness regulation), after examining the influence of adolescent sex, the link between supportive parent-adolescent relationships and adolescent sadness regulation remained significant for adolescent males only. Further, the association between supportive parent-adolescent relationships and adolescent aggression remained significant for males only as well. Considering socialization pressures that discourage displays of sadness in boys compared to girls (Zeman et al., 2019), it may be that parent-adolescent relationships characterized by high levels of acceptance, openness, and emotional support offer a safe space for boys to express sadness. Moreover, research suggests parental discouragement or invalidation of expressions of sadness in young boys has been shown to contribute to later externalizing symptoms (Poon et al., 2017). These findings suggest supportive parent-adolescent relationships may be more conducive to the development of sadness regulation and aggressive behavior in males compared to females. However, it should be noted that estimates of reliability for the sadness regulation subscales were comparatively low (Cronbach's α was 0.61 for adolescent report, and 0.60 for parent report) compared to estimates for the anger regulation subscale, thus findings in model 2 should be interpreted with caution.

4.4. Strengths and limitations

There were a number of strengths reflected in this study. The current study contributed to our understanding of the role of supportive parent-adolescent relationships and ER in adolescent adjustment. With a focus on the parent-adolescent relationship and the emotional exchanges within that relationship, we used an observational measure of relationship quality as an indicator of emotional responsiveness in the parent-adolescent relationship. The other indicator of support, openness in communication, as well as measures of adolescent prosocial behavior and externalizing symptoms were also based on both parent and adolescent reports. Because relationship models encompass the inherently dyadic nature of the parent-adolescent relationship, they are more effective than either just examining parent-driven or child-driven models (Laursen and Collins, 2009). As such, utilizing a multi-method approach and multiple informants strengthened the measure by a means advocated by parenting researchers. Moreover, this study recruited a predominantly low-income, single-parent, and ethnic minority

sample which strengthens our understanding of the pathways linking parenting to adolescent adjustment among families from disadvantaged neighborhoods. Lastly, we explored the potential moderating effects of both adolescent sex and age which increases our understanding of how adolescent characteristics may influence the findings.

Despite the mentioned strengths, one limitation of the investigation was the cross-sectional design which limited the ability to determine causality or examine change in adolescent adjustment. Future research would benefit from the use of longitudinal designs. It is possible and likely that a bidirectional relationship exists between variables. Adolescents with less depressive symptoms and aggressive behavior, or greater prosocial behaviors may be better at regulating their emotions, which in turn improves interactions with parents. Further, a reciprocal relationship may exist between adolescent adjustment variables and supportive parent-adolescent relationships indicators given our knowledge of the influence of adolescent psychopathology on parenting behaviors (Zvara et al., 2018). While we consider our multi-informant approach a strength, we recognize the parent- and adolescent-reports of adolescents' aggressive and prosocial behaviors are only modestly correlated with each other. Our decision to use parent, youth, and observer ratings was influenced by research that emphasizes the multi-informant approach to provide a broader perspective on the parent-adolescent relationship as well as our desire to limit the number of analyses rather than running separate analyses for parent and adolescent reports. Another limitation was the low percentage of fathers included in the study. Including a larger percentage of fathers would help us to better understand how parent's sex may influence indicators of supportive parent-adolescent relationships. Previous research has found differences in emotion socialization behaviors between mother-adolescent and father-adolescent dyads (Poon et al., 2017; Zvara et al., 2018) which is likely to influence the parent-adolescent relationship. Future research should take into consideration the potential effect of different dyad types (e.g., mother-daughter, father-daughter, mother-son, etc.) on supportive parent-adolescent relationships and adolescent adjustment outcomes. Lastly, although we consider our diverse population a strength, it is possible that different patterns of findings would be found in predominantly middle-class, European American, and married samples.

4.5. Implications and conclusions

This study highlights the importance of parent-adolescent relationships characterized by high levels of acceptance, openness, and emotional support as a foundation for supportive emotion socialization strategies in promoting positive adolescent outcomes in a sample of adolescents at-risk. Moreover, this study provides greater insight into the dyadic nature of supportive parent-adolescent relationships, which may have important implications for targeted prevention and intervention programs. Our findings extend the literature by increasing our understanding of the role of parent-adolescent relationships in which both members of the dyad engage in emotionally responsive, open communication and how these interactions may relate to both ER skills and adolescent outcomes in a low-income, ethnic minority sample. Relationship models represent more than the sum of parent-driven effects and child-driven effects and acknowledge the dyadic aspect of the parent–child relationship in which these skills develop. Taking these findings into consideration, parenting programs could focus on facilitating a mutually responsive parent-adolescent relationship with a specific focus on the dynamic nature of emotion socialization during adolescence.

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 Oklahoma State University Institutional Review Board. Written informed consent to participate in this study was provided by the participants' legal guardian/next of kin.

Author contributions

ER, AM, LC, JJ, JS, and MC contributed to the interpretation and application of results. AM, LC, and MC contributed conception and design of the study and data collection and management. AM, LC, JS, and MC contributed to data analysis. LC and ER wrote the first draft of the manuscript. All authors contributed to the article and approved the submitted version.

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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.

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Family function and adolescent altruistic behavior: the multiple mediating effects of self-affirmation and psychological resilience

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Introduction: The current study aimed to explore the relationship between family function and adolescent altruistic behavior, as well as the mediating effects of self-affirmation and psychological resilience in this relationship.

Methods: A survey was conducted on 972 high school students in Guangdong Province using the Family APGAR, GHQSense of Adequacy, Chinese version of Connor-Davidson Resilience Scale, and Altruistic Behavior Scale.

Results: Results found that the score of psychological resilience of males was significantly higher than that of females, but the score of altruistic behavior was significantly lower than that of females. Family function had a positive predictive effect on altruistic behavior. Psychological resilience played a mediating role between family function and altruistic behavior. Self-affirmation and psychological resilience played chain mediating roles between family function and altruistic behavior.

Discussion: This study indicated that family care is crucial for the development of adolescent altruistic behavior, and that it can promote the development of altruistic behavior through the enhancement of self-affirmation and psychological resilience.

KEYWORDS

family function, altruistic behavior, self-affirmation, psychological resilience, multiple mediating effects

Introduction

Altruistic behavior, which refers to the behavior of individuals who voluntarily help others without expecting any rewards or benefits, is an essential aspect of social and moral development during adolescence (Batson, 2010; Kurzban et al., 2015). It reflects a positive attitude toward others, and is considered to be an important indicator of altruistic behavior and social responsibility. Increasingly, research on adolescents showed that altruistic behavior may help reduce dropouts, physical violence, bullying, and mental health problems (Zheng et al., 2021; Herne et al., 2022). Others have pointed out that altruistic behavior is a powerful predictor of children's adjustment outcomes and academic performance (Flynn et al., 2014). Altruistic behavior also has been shown to promote self-efficacy (Patrick et al., 2018) and enhance positive self-evaluation (Fei et al., 2016). Adolescence is a critical period for individuals' growth and development, and it is also a crucial period for shaping behavior and character traits. Thus, it is important to understand the factors that contribute to the development of adolescent altruistic behavior.

The family, as the most important primary socialization agent, plays a vital role in adolescents' psychological and social development (Sheridan et al., 2004; Eales et al., 2021). It provides the emotional and social support that young people need to navigate through the complex developmental tasks of adolescence. Family function, which refers to the quality and effectiveness of family interaction, is a crucial factor that influences adolescent development (Miller et al., 1994; Olson and Craddock, 2019). Many researchers have sought to identify the influence of a family factor on altruistic behavior alone (Fang et al., 2004). However, the mechanisms through which family function influences adolescent altruistic behavior remain unclear. The interactive influence of family system on individual development and the complexity of its process also determines that there may be some intermediary factors between family function and altruistic behavior. Thus, the current study will explore the influence of family function on altruistic behavior of adolescents.

Family function and altruistic behavior

According to the ecological systems theory proposed by Bronfenbrenner (1986), an individual's development is influenced by a series of environmental systems, and the family is the most direct micro-environmental system. The development of an individual's behavior is closely related to factors such as emotional connections and interaction patterns among family members (Ferguson et al., 2013). The family provides necessary material and emotional environments for the physical, psychological, and social development of its members, which is of great significance for their healthy growth and future development. Family function, as a comprehensive variable encompassing many family factors (Gonzalez et al., 2014), is considered to be the embodiment of emotional connections among family members, family rules, family communication, and effectiveness in dealing with external events (Olson and Craddock, 2019).

Intimacy and emotional support among family members can also promote an individual's concern and care for others, thus fostering altruistic behavior (Mikulincer et al., 2005; Wang et al., 2020). In addition, the modeling effect of parents in the family can also influence a child's altruistic behavior. If parents themselves are generous and caring individuals, children are more likely to learn this behavior. Conversely, in an environment where family function is poor, unhealthy interaction patterns and norms among family members, lack of emotional support and intimacy can easily lead to a lack of altruistic behavior in individuals (Fujiwara and Lee, 2012). If children do not receive attention and care in the family, and lack guidance in moral norms and values, they will have a harder time understanding and cultivating altruistic behavior (Lussier et al., 2018). Empirical research also confirmed that altruistic behavior in children is closely related to the intimacy between children and family members. For example, the study examined the relation between emotional responsiveness (using eye-tracking) and altruistic behavior (using the Dictator Game) in 4 to 5-year-old children (N=96) across cultures (India and Germany), the results revealed that altruistic behavior is linked to our responsiveness to others in distress across cultures (Rajhans et al., 2016). Research has found that well-functioning family function not only has a significantly positive predictive effect on online altruistic behavior but also provides positive behavior demonstration and feedback to prevent adolescent rule-breaking and problem behavior and promote altruistic behavior (Song, 2018).

According to the Person-Context Interaction theory, the development of individual psychological behavior is influenced by both environmental and individual factors. Mensah and Kiernan (2010) believed that as an external environmental factor, family factors may affect children's altruistic behavior through mediating processes that affect certain social cognitive abilities. While family function may affect adolescent altruistic behavior, the psychological mechanism linking these two variables remains unclear. Thus, the present study aims to elucidate the underlying mechanism of the relationship between family function and altruistic behavior.

Self-affirmation as a mediator

Self-affirmation is a process in which individuals affirm their own value that is unrelated to the threat, in order to restore self-integrity and maintain a positive self-image when facing a threat (Steele, 1988). Self-Affirmation theory suggests that individual behavior results from the interaction between the self-system and the social system. In the self-system, the way people view themselves motivates them to behave in a certain way. Self-affirmation can enhance the clarity of an individual's self-concept by emphasizing their values, principles, and standards, or by emphasizing their positive traits (such as kind and moral), but both can enhance an individual's self-integrity (Crocker et al., 2008; Cohen and Sherman, 2014). Self-integrity is a sense of efficacy, which is an individual's perception of their ability to control important outcomes. This can help enhance an individual's sense of self-worth, thus further promoting altruistic behavior (Crocker et al., 2008). Furthermore, self-affirmation has been shown to promote greater empathy and compassion toward others, which are critical components of altruistic behavior (Exline and Zell, 2009). These theoretical models have been demonstrated in several studies. For example, researchers found that college students' moral self-affirmation can positively predict online altruistic behavior.

This study discussion by examining the relationship between self-esteem and parental relationship in a sample of 316, the research results showed that there is a close relationship between self-esteem and parent-child relationships, and that a close parent-child relationship has a positive impact on self-esteem (Midgett et al., 2002). Negative parenting styles are negatively correlated with individuals' self-esteem (Yang and Gu, 2011). Furthermore, research has found that higher social support is an important environmental variable that promotes individuals' self-affirmation, enhances their confidence in overcoming difficulties, and increases their level of self-esteem (Marshall et al., 2014). In other words, individuals who have more positive evaluations of themselves and greater self-affirmation tend to have higher levels of self-esteem, to some extent predicting their level of self-esteem (Haddock and Gebauer, 2011). A family with effective functioning often provides more support and warmth among its members, suggesting that family function can promote the development of self-affirmation. Therefore, we speculate that self-affirmation may act as a mediator between family function and adolescent altruistic behavior.

Multiple mediating effects

Psychological resilience refers to an individual's ability to adapt and cope with stressors, adversity, and trauma (Masten, 2001). Resilience involves a complex interplay of biological, psychological, and social factors that can facilitate positive adaptation in the face of adversity (Luthar and Becker, 2010). Individuals with higher levels of resilience are better able to regulate their emotions, maintain positive relationships, and

engage in adaptive coping strategies (Tugade et al., 2005). Research has found that higher levels of resilience are associated with greater altruistic behavior, including volunteering and charitable donations. A study of professional's caregivers in Spain (Martí-Vilar et al., 2022) found that resilience is a variable prediction of altruistic behavior in health and social professionals. Resilience gets in the individual the capacity to be attentive to give answers in certain situations, being a predictor of great relevance of the altruistic behavior. The theory of Family Function suggests that the normal operation of basic functions in a family can provide physical, psychological, and economic support for family members, enhance the internal emotional connection between family members, jointly cope with stress and various stressful situations, and promote the improvement of individual psychological resilience level (Olson and Craddock, 2019). In summary, adolescents who experienced harmonious environment with a balanced family function may be more likely to develop psychological resilience, which may engage in more altruistic behavior.

On the other hand, according to the metatheory of Resilience and Resiliency (Richardson, 2002), when an individual's inherent state of stability is disrupted by external events, they need to restructure themselves to form a new stable state. The level of the new stable state depends on the interaction between the challenges faced by the individual and various protective factors. If the influence of protective factors is greater than that of challenging factors, the individual will develop a higher level of resilience reintegration than before, leading to an enhancement of their psychological resilience. Research has found that self-affirmation helps activate individuals' positive resources, enhance their sense of identity, enable them to view themselves and their surrounding environment from a broader perspective, maintain their overall self-integrity and positive self-image, and thus alleviate and reduce the negative impact of stress and threats to social identity (Steele, 1988; Hadden and Easterbrook, 2020). Therefore, this implies that self-affirmation may have a close relationship with the enhancement of psychological resilience. Specifically, adolescents who have a strong sense of self-worth and personal values, and who are resilient in the face of adversity, may be more likely to engage in altruistic behaviors. Currently, there is no research directly exploring the relationship between self-affirmation and psychological resilience.

The present study

Altruism is regarded as an important quality in Chinese traditional culture and has been widely valued. Prior studies have shown that the relationship between family function and adolescent altruistic behavior is complex and influenced by psychological resilience and gender factors (Lussier et al., 2018; Cui et al., 2022). Family function may play a critical role in shaping the development of self-affirmation and psychological resilience, which in turn promote altruistic behavior. However, to the best of our knowledge, the interplay between these factors and their joint effects have not been fully explored. This study aims to fill this gap by examining the multiple mediating effects of self-affirmation and psychological resilience on the relationship between family function and adolescent altruistic behavior.

In the present study focused on middle school students, we hypothesize that self-affirmation and psychological resilience may act as parallel mediators, with each pathway independently mediating the relationship between family function and adolescent altruistic behavior. Additionally, self-affirmation and psychological resilience may act as a chain mediator, with family function predicting self-affirmation, which in turn predicts psychological resilience, and ultimately predicts adolescent altruistic behavior. The model to be tested is presented in Figure 1.

Materials and methods

Participants

This study used convenience sampling, and questionnaires of the study were gathered in March 2022 in certain normal high schools in Guangdong Province in China. After obtaining the informed consent of the school leaders and students, the researchers first explained the rules for filling in the questionnaire to the students, and then the students completed the questionnaire through mobile phones independently. A total of 1,060 questionnaires were distributed. After eliminating invalid questionnaires, 972 valid questionnaires were obtained, with an effective rate of 91.69%. The average age of the subjects is 16.74 ± 1.01 years. Among them, 400 are males (41.15%), and 572 are females (58.85%); 252 are the only children in their family (25.93%), and 720 are non-only children (74.07%); there are 338 (34.78%) students in the first year of high school and 634 (65.23%) students in the second year of high school. And 658 (67.69%) students are from urban areas, while 314 (32.30%) students are from rural areas.

Measures

Family APGAR

This study applied the Family APGAR which was developed by Smilkstein et al. (1982) to measure the subjects' family function. The family APGAR consists of five items, including adaptation fitness, partnership, growth, affection, and resolve. Points of each item is assigned 0 (never), 1 (sometimes), and 2 (often). The higher total score, the better the family function. The questionnaire was modified by Lv and Gu (1995) to be suitable for Chinese. The Chinese version has been reported as a reliable tool. In this study, the Cronbach's alpha coefficient for the scale was 0.83.

GHQ-sense of adequacy

This study applied the General Health Questionnaire (GHQ) Sense of Adequacy which was developed by Goldberg et al. (1998) to measure the self-affirmation. The GHQ (20-item) was modified by Lihong and his coworkers (Li and Mei, 2002) for localization to be suitable for Chinese. This study selected the GHQ-Sense of Adequacy (9-item) subscale from the GHQ-20 questionnaire. The scale is scored from "Yes = 1" to "No = 0." The higher the score, the stronger the degree of self-affirmation. The items were found to be reliable and valid in prior research (Li and Mei, 2002). The GHQ-Sense of Adequacy Cronbach's α coefficient is 0.71 in the present study.

Chinese version of Connor-Davidson resilience scale

This study applied the Chinese version of Connor-Davidson Resilience Scale (CD-RISC) to measure the psychological

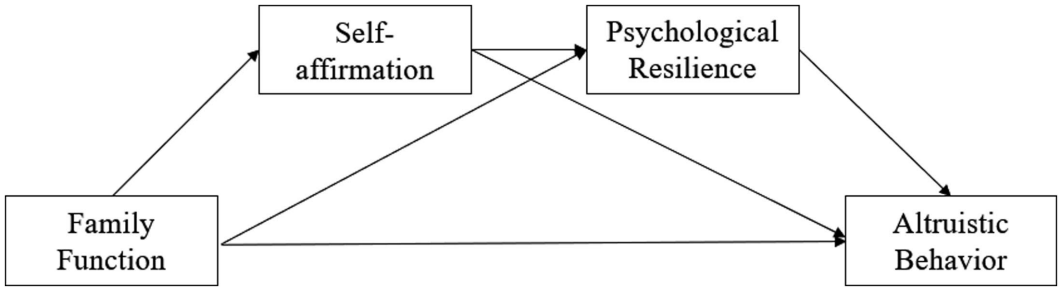

FIGURE 1
The hypothesized model.

resilience. The scale initially comprised 5 factors and 25 self-reported questions (Connor and Davidson, 2003). In China, Yu et al. (2011) translated the scale into a Chinese version and instead yielded a 3-factor structure (tenacity, strength, and optimism) in a Chinese community sample. Many subsequent studies have provided evidence that the revised scale is more suitable for Chinese (Xie et al., 2016). The 25-item Likert-scale (0 = not at all, 4 = extremely true) was used to assess the resilience of the study sample with a total of 100 scores. A higher score indicates a higher level of resilience. The Chinese version of Connor-Davidson Resilience Scale Cronbach's α coefficient is 0.93 in the present study.

Altruistic behavior scale

The scale, prepared by Li (2008), contains five dimensions: altruistic behavior responsibility, respect and care for others, care and care for oneself, altruistic behavior performance, and self-interested behavior and concepts. There are a total of 22 items in the scale, and the Likert 7-level score from "very inconsistent" to "very consistent" is adopted. The higher the total score, the higher the altruistic level. Among them, questions 1, 2, 3, 5, 7, 8, 10, 14, and 18 are reverse scoring. The items were found to be reliable and valid in prior research (Zheng, 2013). In this study, the internal consistency of the five factors of the scale is between 0.73 and 0.81. Cronbach's α Coefficient is 0.82.

Data analysis and common method bias test

This study used SPSS 26.0 to perform descriptive statistics, *t*-test, and correlation analysis on the collected data, and used the PROCESS V4.0 macro program of Hayes to test and analyze mediating effects. The data collected in this study is self-reported, so the common method deviation test is required. In this study, Harman single factor test method was used for exploratory factor analysis. The results showed that 11 common factors with characteristic value greater than 1 were obtained from the factor analysis without rotation, and a total of 11 factors were greater than 1. The first factor explained 21.07% variance and less than 40% marginal value, indicating that there was no serious common method deviation in this study (Zhou and Long, 2004).

Results

Descriptive statistics and correlation analysis

Descriptive statistics and Pearson's correlations for the main variables are presented in Table 1. The results show that compared with males, females have lower scores of psychological resilience ($t = -6.26$, $p < 0.001$) and higher scores of altruistic behavior ($t = 3.21$, $p < 0.01$). The results of Pearson's correlation analysis showed that the correlation between family function, self-affirmation, psychological resilience and altruistic behavior was significant ($p < 0.01$).

Regression and mediation effect analysis

According to the results of the correlation analysis in this study and the statistical preconditions of the mediation effect, further mediation effect analysis of self-affirmation and psychological resilience can be carried out (Wen and Ye, 2014). With family function as the independent variable, altruistic behavior as the dependent variable, self-affirmation and psychological resilience as the intermediary variables, the study used the bias-corrected percentile Bootstrap method in the SPSS macro program Process compiled by Hayes to analyze the mediating effect, and Model 6, which specialized in analyzing chain mediation effects, was used for testing. The Bootstrap sampling number is 5000, the confidence interval is set to 95%.

The results show that family function has a positive predictive effect on altruistic behavior ($\beta = 0.20$, $p < 0.001$); family function has a positive predictive effect on self-affirmation ($\beta = 0.30$, $p < 0.001$); family function has a positive predictive effect on psychological resilience ($\beta = 0.14$, $p < 0.001$); psychological resilience has a positive predictive effect on altruistic behavior ($\beta = 0.28$, $p < 0.001$);self-affirmation has a positive predictive effect on psychological resilience ($\beta = 0.44$, $p < 0.001$). Self-affirmation has no positive predictive effect on altruistic behavior ($\beta = 0.07$, $p = 0.08$), see Table 2.

The intermediary effect test showed that the direct effect of family function on altruistic behavior was 0.16, accounting for 39.02% of the total effect; family function affects altruistic behavior through psychological resilience, and the intermediary effect is 0.13, accounting for 31.71% of the total effect of family function on altruistic behavior; family function has an impact on altruistic

TABLE 1 Descriptive statistics and correlation coefficient matrix (N=972).

	Males	Females	1	2	3	4
1. Family function	5.33 ± 2.55	5.39 ± 2.69	–			
2. Self-affirmation	5.67 ± 2.18	5.76 ± 2.32	**0.29*****	–		
3. Psychological resilience	63.61 ± 13.78	56.12 ± 13.80	**0.30*****	**0.54*****	–	
4. Altruistic behavior	101.89 ± 8.79	103.95 ± 8.46	**0.16****	**0.28*****	**0.39*****	–

**$p < 0.01$, ***$p < 0.001$.

TABLE 2 Model for regression analysis between variables (N=972).

Predictor variable	Outcome variable: SA	Outcome variable: PR	Outcome variable: AB
	β (boot SE) 95%BootCI	β (Boot SE) 95%BootCI	β (Boot SE) 95%BootCI
FF	0.30 (0.03) [0.29, 0.74]	0.14 (0.09) [0.22, 0.57]	0.06 (0.11) [−0.02, 0.43]
SA		0.44 (0.10) [1.30, 1.70]	0.07 (0.15) [−0.03, 0.56]
PR			0.28 (0.05) [0.23, 0.41]
	$R^2 = 0.09$, $F = 26.06$***	$R^2 = 0.31$, $F = 89.29$***	$R^2 = 0.13$, $F = 23.01$***

**$p < 0.01$, ***$p < 0.001$. FF, Family Function; SA, Self-Affirmation; PR, Psychological Resilience; AB, Altruistic Behavior.

behavior through the chain mediating roles of self-affirmation and psychological resilience, with an effect of 0.12, accounting for 29.27% of the total effect of family function on altruistic behavior. The mediating effect of self-affirmation between family function and altruistic behavior is not significant (The 95% BootCI is [−0.01, 0.16], including 0), see Table 3 and Figure 2.

Discussion

Descriptive statistical results showed that boys' scores for psychological resilience were significantly higher than those of girls. Psychological resilience is a concept influenced by gender social norms (Mackenzie et al., 2006), with deep cultural influences behind it. Generally speaking, compared to girls, parents, teachers, and society as a whole in China always hope that boys can show more independence and grow up to be a "real man" (Wang et al., 2020). This expectation of male roles enhances male independence and autonomy, both consciously and subconsciously, which leads males to always think that they should complete something independently, and their confidence in completing something also increases (Eagly and Karau, 2002; Rudman and Glick, 2021). Therefore, when facing adversity, males' resilience often creates more coping strategies, which is part of the construction of psychological resilience. On the other hand, descriptive statistical results showed that females' scores for altruistic behavior were significantly higher than males'. Both Eastern and Western cultures believe that females are more sensitive to the emotions of others and have stronger empathy (María et al., 2009; Wang et al., 2020). According to the Empathy-Altruism Hypothesis, this trait benefits females in discovering more needs for help and showing more altruistic behavior (Batson, 1987; Luo et al., 2013). On the other hand, Relationship Theory suggests that compared to males, females have higher expectations for developing and maintaining personal relationships with others (Susan, 1998). Females are usually more concerned with their interpersonal relationships, and are more prone to emotional distress when their social relationships are damaged. This psychological characteristic may also drive females to develop and maintain effective interpersonal relationships by showing more altruistic behavior. Under the cultural framework of China, Chinese girls are taught from an early age to be compassionate, considerate, and caring toward others; however, the requirements and subtle education for boys in Chinese culture often suggest that they should not be too concerned about details or avoid being emotional (Li et al., 2017). Therefore, Chinese girls are expected to show more altruistic behavior.

After controlling for gender and age, this study found that family function had a significant positive influence on altruistic behavior among adolescents, consistent with previous research results (Laible et al., 2004; Cui et al., 2022). In families with effective function, family members have close intimacy and higher cohesion, and parents exercise relatively less psychological and behavioral control over their children. Children in relaxed family atmospheres tend to have healthier mindsets, are better at emotional expression, and are able to perceive their own emotional changes (Gittleman et al., 1998). On the other hand, children who perceive others as benevolent and trustworthy are more likely to consider others (Mikulincer et al., 2005). Empirical research also supports this theoretical assumption: Effective family function can promote teenagers to correctly influence others' cognition in interpersonal communication, better understand others' emotions, and improve children's empathy ability (Wang et al., 2020). According to the Empathy Altruism Hypothesis (Batson, 1987), when the level of opinion taking and empathy is high, adolescents are more likely to have altruistic motives and show altruistic behavior.

This study further found that family functionality affected altruistic behavior through psychological resilience. Hobfoll (2001) proposed the Conservation of Resources theory, which suggests that people actively strive to obtain, maintain, protect and cultivate valuable resources. Individuals with more resources are less susceptible to resource loss and are more likely to acquire resources. The Gain Spiral of the Conservation of Resources theory reveals that people with more resources are more likely to gain more resource benefits, and the initial resource benefits further lead to more resource benefits,

thereby entering a spiral of resource gain (Hobfoll, 2001; Su, 2017). Effective family function is a valuable resource that may promote adolescents to obtain more resource gains, such as developing high levels of psychological resilience. According to the Broaden-and-Build theory of Positive Emotions (Isgett and Fredrickson, 2004), individuals with high psychological resilience can better expand their range of individual attention, cognition and action. Individuals with high levels of psychological resilience often have more positive emotions and optimistic attitudes, which further provide necessary psychological resources for adolescents to implement altruistic behavior (Tugade et al., 2005). Therefore, adolescents who grown up in a effective family atmosphere will receive higher social support, perceive harmonious and intimate family relationships, and often develop higher levels of psychological resilience, further exhibiting more altruistic behaviors. This result also coincides with the concept proposed by Social Exchange theory.

Finally, this study also found that family function could influence altruistic behavior through a chain-mediated effect of self-affirmation and psychological resilience. According to the Conservation of Resources theory and the Gain Spiral effect (Hobfoll, 2001), effective family function as a valuable resource may promote adolescents' higher levels of self-esteem and self-worth (Yang and Gu, 2011; Marshall et al., 2014). Therefore, adolescents who grown up in a positive family function environment tend to develop higher levels of self-affirmation. The Metatheory of Resilience and Resiliency (Richardson, 2002; Feng et al., 2022) suggests that social stressors and protective factors interact to determine whether individuals can maintain internal stability. Social psychological factors are crucial in forming resilient reintegration. Based on the Motivation's Social Cognitive theory, individuals with high self-esteem and self-worth in stressful environments tend to focus more on opportunities for improving their abilities rather than being overly concerned with setbacks, and they can maintain a positive mood, even becoming more optimistic (Dweck, 2000; Schunk and Dibenedetto, 2019). This actually implies that self-affirmation is a protective factor for psychological resilience and contributes to individuals' resilient reintegration. Therefore, they can better perceive and understand the situation of others (Cohen and Sherman, 2014). Specifically, effective family function can facilitate the development of high levels of self-affirmation in adolescents. High levels of self-affirmation are conducive to high levels of psychological resilience, and individuals with greater psychological resilience tend to be more positive and optimistic, allowing them to accumulate more psychological resources and ultimately exhibit more altruistic behaviors. In sum, this study indicated that family care is crucial for the development of adolescent altruistic behavior, and that it can promote the development of altruistic behavior through the enhancement of self-affirmation and psychological resilience.

TABLE 3 Mediation effect analysis (N=972).

Model pathways	Effect size	Boot SE	95%BootCI
Direct effect			
FF—AB	0.16	0.11	[0.29, 0.74]
Indirect effect			
FF—SA—AB	0.07	0.04	[−0.01, 0.16]
FF—PR—AB	0.13	0.04	[0.06, 0.20]
FF—SA—PR—AB	0.12	0.03	[0.08, 0.17]

**p < 0.01, ***p < 0.001. FF, Family Function; SA, Self-Affirmation; PR, Psychological Resilience; AB, Altruistic Behavior.

Firstly, parents can focus on improving family functioning by establishing a positive parent-child relationship and communication, fostering adolescents' self-affirmation and psychological resilience, thereby promoting their altruistic behavior. Secondly, schools and educators can integrate altruistic values into educational curricula, teaching knowledge and skills related to cooperation, care, and social responsibility. Additionally, providing opportunities for students to participate in community service projects, volunteer activities, and team collaboration can cultivate their altruistic behavior. Thirdly, policymakers can develop relevant policies and initiatives to encourage altruistic behavior in the social environment. For example, implementing reward systems, scholarships, or honors to recognize and motivate adolescents' altruistic actions. Moreover, policies can promote community engagement and the cultivation of a spirit of mutual assistance, providing more opportunities for adolescents to participate in social welfare activities. Overall, these measures and strategies, as mentioned above, can be implemented by parents, educators, and

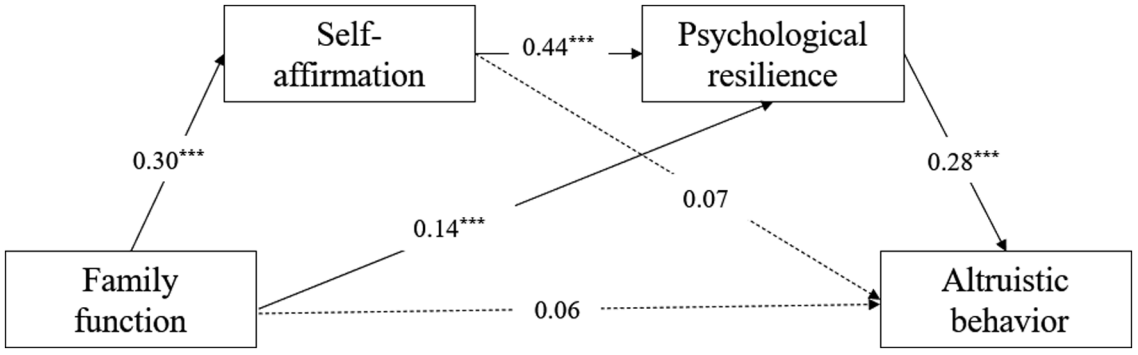

FIGURE 2
Multiple mediating effects of self-affirmation and resilience. ***p<0.001.

policymakers based on the research findings to promote adolescent altruistic behavior. These efforts contribute to the establishment of positive family environments, educational systems, and supportive social structures, fostering a greater number of adolescents with an altruistic spirit.

Limitation

There are several limitations in this study. Firstly, it primarily relies on cross-sectional data, which prevents the establishment of causal relationships between variables. To gain a more comprehensive understanding, future research should consider employing longitudinal designs to explore these relationships in greater depth. Second, all variables in the study only use the subjective reporting method of individual students. More objective data need be obtained by combining multiple methods such as parents, teachers and peer evaluation to reduce the social praise effect.

Conclusion

This study enriches our understanding of the relationships between family function and adolescent altruistic behavior. Our findings showed that the relation between family function and adolescent altruistic behavior is mediated by self-affirmation and psychological resilience. These results help us to understand that family care is crucial for the development of adolescent altruistic behavior, and that it can promote the development of altruistic behavior through the enhancement of self-affirmation and psychological resilience.

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 Ethics Committee of Guangzhou University. Written informed consent to participate in this study was provided by the participants' legal guardian/next of kin.

Author contributions

HC conceived the study, drafted the manuscript, and took responsibility for the manuscript as a whole. YM and XB provided advice on study design and supervised the data collection. XB, WZ, and XZ participated in data collection and data analysis. All authors contributed to the article and approved the submitted version.

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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.

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A qualitative exploration of reunification post alienation from the perspective of adult alienated children and targeted parents

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Introduction: The aim of this study was to explore the experiences of voluntary reunification from the perspectives of adult alienated children and targeted parents.

Methods: Nine adult alienated children and 12 targeted parents participated in semi-structured interviews which were transcribed verbatim and analyzed thematically.

Results: Six themes emerged in the data from the adult alienated children including catalysts for reunification, factors influencing reunification, adult alienated child relationships, the role of communication in reunification, adult alienated child understandings of alienation post reunification, and the role of therapy in reunification. Three themes emerged from the targeted parents including what is reunification, factors impacting reunification, and life after reunification.

Discussion: Findings from the present study offer novel insights into the experience of voluntary reunification from the perspectives of both adult alienated children and targeted parents. They illustrate that voluntary reunification is a process that takes time. This process can span decades and can include periods of connection and rejection.

KEYWORDS

parental alienation (PA), parental alienating behaviors, targeted parents, alienated child/children, trauma informed approach

What is parental alienation?

Parental alienation occurs when a child strongly aligns with one parent (the alienating parent), while rejecting a relationship with their other previously loved parent (the targeted parent) (Bernet et al., 2010). The rejection of the targeted parent is a consequence of parental alienating behaviors used consistently by the alienating parent to undermine the targeted parent–child relationship (Haines et al., 2020). Parental alienation commonly occurs in the context of separation and/or divorce.

The alienated child's relationship with the targeted parent is often characterized by withdrawal, hostility, or contempt (Clawar and Rivlin, 2013). It is suggested that the attachment between the alienated child and targeted parent is distorted because of the alienating parent delivering inaccurate messages to the alienated child about the targeted parent in conjunction with interruptions to time the child spends with the targeted parent. Such messages and an inability to spend continuous time with the targeted parent over-ride the alienated child's actual history and experience of security with the targeted parent (Baker, 2007; Harman et al., 2021). The primary outcome of being exposed to parental alienating behaviors is the complete

breakdown and loss of relationship between a parent and child (Baker, 2007; Bentley and Matthewson, 2020; Harman et al., 2021; Verhaar et al., 2022).

Alienating parents may differ vastly in the type and number of parental alienating behaviors they use. Common parental alienating behaviors include emotional manipulation of the child and targeted parent, disrupting time the child spends with the targeted parent, withholding or interfering with information the targeted parent receives about their child, encouraging the child to defy the targeted parent, defaming/denigrating the targeted parent to the child and in front of the child, and erasing the targeted parent from their child's life (Haines et al., 2020; Harman and Matthewson, 2020).

Parental alienating behaviors as family violence

Parental alienating behaviors are widely considered a form of family violence in the literature (e.g., Bentley and Matthewson, 2020; Haines et al., 2020; Harman and Matthewson, 2020; Lee-Maturana et al., 2020; Verhaar et al., 2022). Family violence is defined as any act of violence perpetrated by one family member against another. It includes violence perpetrated by cohabitating/non-cohabitating partners/ex-partners, intimate partner violence (IPV) and the abuse and neglect of children (Chalk and King, 1998). A central feature of family violence is coercive control. Coercive control is a pervasive pattern of behaviors used by a family member to maintain power over and limit the autonomy and choices of another family member. It involves isolating victim/survivors from other family members, their children and friends, controlling access to resources, finances and regulating the victim/survivor's daily life (Candela, 2016). Arguably, coercive control is at the heart of parental alienating behaviors.

Impacts of parental alienating behaviors

The impacts of parental alienating behaviors are significant and severe. Parental alienating behaviors can create reality distortions and compromised reality-testing for alienated children. Parental alienating behaviors inhibit children's interpersonal development to the extent that they can become socially withdrawn and have difficulties in relationships with others. These effects are often enduring (Baker, 2007; Bentley and Matthewson, 2020; Haines et al., 2020; Verhaar et al., 2022). Adult alienated children have reported experiencing depression, anxiety, low self-esteem, substance abuse, and trauma reactions in response to being alienated from a parent (Baker, 2007; Baker and Ben-Ami, 2011; Ben-Ami and Baker, 2012; Bentley and Matthewson, 2020; Verhaar et al., 2022). Adult alienated children also have described experiencing guilt and shame, mistrust in themselves and of others (Baker, 2007; Bentley and Matthewson, 2020; Verhaar et al., 2022). Further, adult alienated children can become alienated from their own children (Verhaar et al., 2022). Parents alienated from their own children due to parental alienating behaviors report experiencing moderate to high levels of depression, anxiety, stress (Vassiliou and Cartwright, 2001; Baker, 2010b; Balmer et al., 2018); social isolation, feelings of powerlessness, loneliness, despair, and suicidal ideation (Vassiliou and Cartwright, 2001; Balmer et al., 2018; Poustie et al., 2018; Lee-Maturana et al., 2020).

The effects of parent alienating behaviors and parental alienation can be understood using attachment theory. Bowlby stipulated that continuous, warm, and involved contact between a child and caregiver is necessary to form and sustain a healthy attachment. If any of these conditions are not met, an attachment, particularly a secure base, cannot be formed (Bowlby, 1988). Alienated children are led to believe through parental alienating behaviors that the targeted parent does not want or love them. The child's critical thinking skills are compromised and their capacity to trust their own perceptions are damaged by this process, which results in internal working models of the self as unlovable and others as unsafe and unloving (Harman and Lorandos, 2021). This negatively impedes psychosocial development and preservation of a secure attachment between the child and the targeted parent. Several studies confirm this and demonstrate that adult alienated children are less likely to be securely attached in their adult relationships (Baker, 2007; Bentley and Matthewson, 2020; Harman et al., 2021; Verhaar et al., 2022).

Voluntary reunification

Reunification between the targeted parent and child following parental alienation can occur. Reunification can occur because of therapeutic and legal interventions (see Templer et al., 2017). Voluntary reunification (also referred to as spontaneous reunification) can be defined as a process that occurs when an alienated child actively seeks to restore the relationship with the targeted parent independently from court orders or therapy (Darnall and Steinberg, 2008b).

There is limited research exploring voluntary reunification. Research to date has focused on catalysts for voluntary reunification. Baker (2007) explored the experience of adult alienated children and identified 11 catalysts for reunification. This included maturation of the child that allowed for the cognitive capacity to reflect on their childhood experience more objectively. The alienating parent turning on the child. Experiencing parental alienation as a parent. The targeted parent coming back into the child's life thus giving the child experiences with the targeted parent that challenge the alienating parent's narrative. Attaining a milestone that triggered a need to reconnect with the targeted parent. Engaging in therapy that was a safe and non-judgmental space facilitating reflection. Intervention of extended family. Intervention of significant others. Seeing the alienating parent mistreat others. Discovering that the alienating parent was dishonest. Becoming a parent. Voluntary reunification can also be prompted by a crisis or significant change the adult alienated child's life (Rand and Rand, 2006; Darnall and Steinberg, 2008a,b).

Rand and Rand (2006), Baker (2007), and Darnall and Steinberg (2008a,b) highlighted the difficulties associated with defining successful voluntary reunification because the process is fragile and not a linear one. Successful voluntary reunification is achieved when there is a resumption of an ongoing and healthy relationship between an alienated child and both parents. According to this definition, one third of voluntary reunifications were considered successful in Darnall and Steinberg (2008a) study. Darnall and Steinberg (2008a,b) noted that successful voluntary reunification could partly be attributed to targeted parents resisting any desire to convince the child that the child's interpretations or recollections of past events were wrong. Factors that limited successful voluntary reunification included

targeted parents not meeting their child's expectations and/or lacking empathy and emotional availability (Darnall and Steinberg, 2008a,b).

Baker and Fine (2014) examined the experience of targeted parents who had reunified with their children. They found that reunification was possible when the targeted parent never gave up hope of reunification, could see the alienation experience from the child's perspective, had realistic expectations of the child and moved at the child's pace. This was made possible by the targeted parents becoming educated and informed on parental alienation.

With limited research into the process of voluntary reunification, the aim of the current study was to examine the experience of both adult alienated children and targeted parents who have voluntarily reunified with a parent and targeted parents who have voluntarily reunified with their child/children. Currently, there are a lack of intervention programs designed to support families through the voluntary reunification process (Haines et al., 2020). The results of this research may help to inform recommendations for intervention programs.

Methods

Participants

The study included 9 participants identified as targeted parents who had reunified with at least one child; 7 participants identified as adult alienated children who had reunified with their targeted parents (6 of whom were currently alienated from their own children); and 2 participants identified as reunified targeted parents and reunified adult alienated child. In total, 11 targeted parents provided their stories of reunifying with a child and 9 adult alienated children provided their stories of reunifying with a parent.

Adult alienated children were 41–61 years of age. Three were from Australia and 6 were from the United States of America. All adult alienated children identified as female. Two had reunified with their mother and 7 had reunified with their father. Adult alienated children were reportedly alienated from a parent for 7–19 years. Some adult alienated children found it difficult to quantify how long they had been reunified for. This ranged from "not fully reunified" to over 20 years reunified. In some cases, adult alienated children said that although they had been in contact with their targeted parent for several decades, they did not consider their relationship with them to be fully reunified.

Targeted parents were 47–65 years of age. Seven were from Australia, 1 from Thailand, 1 from the United States of America, 1 from Canada and 1 from South Africa. Eight identified as female and 3 identified as male. Targeted parents were reportedly alienated from 1 to 3 children and reunified with 1–3 children. In most cases, targeted parents had not reunified with all their children. Targeted parents were alienated from their children from between 2 and 15 years. Targeted parents found it difficult to quantify how long they had been reunified with their children. The estimated length of time since reunification ranged from 2 weeks to 4 years.

Procedure and materials

Ethics approval was obtained from the Social Sciences Human Research Ethics Committee at the University of Tasmania. Recruitment for the study was carried out nationally and internationally via advertisements on social media, online support groups for people affected by parental alienation and advertisements in psychology practices. The advertisement consisted of the following information: "*Were you isolated from one of your parents when you were younger as a result of conflict between your parents? Were you isolated from your child as a result of conflict with your partner or ex-partner? Have you since re-established a relationship with the parent or child you lost contact with? This study is looking at the process of reunification between alienated parents and their adult children.*" Interested individuals were invited to email the research team. They were then sent an information letter on the purpose and nature of the study, a consent form, and screening questionnaire. The targeted parent screening questionnaire was originally developed and employed by Balmer et al. (2018) and asked individuals to indicate if their child had been exposed to 13 common parental alienating behaviors. Individuals who endorsed at least six out of 13 items were considered eligible to participate. Adult alienated children were asked to complete the Baker Strategies Questionnaire (BSQ) (Baker and Chambers, 2011) and considered eligible to participate if they reported experiencing over 50% of noted parental alienating behaviors. All individuals were identified as having reunified post alienation.

Eligible individuals shared their experience of parental alienation and subsequent reunification with researchers in 60–90-min semi-structured qualitative interviews. Interviews were conducted via Zoom or Skype, both considered satisfactory and viable tools to use for the collection of qualitative data (Drabble et al., 2016; Lo Iacono et al., 2016; Archibald et al., 2019). Interviews were audio-recorded for accuracy and transcribed verbatim. Participants were given the opportunity to edit their transcripts to maximize data accuracy and clarity. Data analysis included only the edited transcripts.

Data analysis

The current study followed a qualitative descriptive design. The aim of a qualitative descriptive design is to offer a summary of events (experienced by individuals or groups of individuals) in everyday language (Sandelowski, 2000). This type of design allows for the description of data in a manner that is low-inference and fact-based.

An inductive approach was utilized to analyze the data because it permits a data-driven approach. Themes were identified at an explicit level, reducing potential bias, or personal motivation and/or opinion of the researchers. Braun and Clarke (2021) six-phase model of thematic analysis was utilized to ensure thorough data analysis. The six-phase model includes: data familiarization, generation of initial codes, searching for potential over-arching themes, reviewing themes, defining and naming themes, and producing the report.

Data trustworthiness was determined using Forero et al. (2018) four-dimension criteria, adapted from Lincoln and Guba (1985). Criteria include credibility, transferability, dependability and confirmability. Credibility was established through the development of an interview protocol and researcher training in the application of the protocol, triangulation of the data by comparing themes and subthemes to individual transcripts and to existing literature. Regular meetings of the researchers to discuss the data were held. Transferability was achieved by reaching data saturation. Data saturation was reached when no new themes were evident in the

dataset. Dependability was achieved by keeping an audit trail of the data and analyses. Data were stored in QSR International's NVivo-11 data analysis software. Data were coded by four researchers who were consistent in their identification and coding of themes and subthemes. Confirmability was also achieved through these processes.

Results

Adult alienated child experiences of reunification

Six themes were identified: (1) catalysts for reunification, (2) factors influencing reunification, (3) alienated child relationships, (4) the role of communication in reunification, (5) alienated child understanding of parental alienation post reunification, and (6) the role of therapy in reunification.

Catalysts for reunification

Adult alienated children referred to several catalysts for reunification, within which three subthemes were identified.

Readiness of adult alienated child

Five adult alienated children referred to their own readiness as a key factor in seeking to reunify with their targeted parent. Readiness included feeling ready to accept both of their parents after parental alienation.

> *What I wanted more than anything in my life was to have a family that was whole. And I was willing to accept my parents for who they were.*

Readiness involved adult alienated children permitting themselves to love their targeted parents after alienation.

> *… I think the time I went to my father and I hugged him was when I gave myself permission to love him. I think that's what reunification is … It's that permission, that feeling of, 'I'm allowed to love you.'*

Other adult alienated children described being ready to explore a relationship with their targeted parent in search for a sense of wholeness and resolution.

> *I felt like I wanted to find a place where I belonged … I had this parent out there that I had no idea existed … I felt like I was missing part of myself … a small part of a need for me to just … resolve some things.*

Personal experiences of divorce or parental alienation

Three adult alienated children described how divorce and alienation from their own children prompted them to reflect on their childhood. They described beginning to question their alienating parent's behavior and becoming more curious about their own alienation from the perspective of their targeted parent.

> *And that's when I started to realise, 'okay wait, if [my ex-partner] is going around and easily telling these lies about me, and … people are believing him, I wonder if my mum did that to me about my dad?'*

Illness or death of a family member

Two adult alienated children described the illness or death of a family member led to them seeking to reunify with their targeted parent. One adult alienated child described experiencing compassion and love for their targeted parent after the death of a family member, leading them to reconnect. Another adult alienated child reported recognizing the importance of coming together with their targeted parent for support in dealing with the loss of a loved one, rather than grieving alone.

Factors influencing reunification

Adult alienated children referred to several factors which they believed influenced reunification with their targeted parent. Factors were classified into three subthemes.

Alienating parents

Seven adult alienated children reported that their alienating parent interfered with reunification. For some, interference involved alienating parents actively working against reunification. Interference was also reported involved alienating parents reinforcing negative beliefs or frustrations adult alienated children had about their targeted parents during the reunification process.

> *Like just recently I told [my alienating parent] that I was actually contacting [my targeted parent] again and … she doesn't want to hear it. You can feel it … her entire body is tense if [my targeted parent's] name's mentioned … but she's very happy if I turn around and say, 'he's a pain in the arse.' Then she agrees with me. Then she relaxes. Then she talks about him being a pain in the arse.*

Some adult alienated children referred to the longevity of the alienating parent's influence on their thinking and behavior post alienation, which can deter reunification attempts. Some reported that their alienating parent rejected them when they resumed contact with the targeted parent. One adult alienated child described how the influence of the alienating parent on reunification continued beyond the alienating parent's own death.

> *I would say my [alienating parent's] passing away had a negative impact on my relationship with my [targeted parent]. I think [my targeted parent] saw it as a means to open the door because the influence was no longer there, not realising that the influence is still there … I held onto my [alienating parent] probably more tenaciously after her death … than I did before. I think I would have been more open before her passing because it would have allowed me more time to see her flaws and deal with her flaws … and come to terms with the situation.*

Other family members and friends

Four adult alienated children stated that other people aside from their alienating parent interfered with reunification. These people included siblings, stepparents, extended family, and friends.

> *This is such a nasty, nasty dynamic, this whole thing, because so many people get involved that make it really, really difficult for you to have a relationship with someone that you really care about.*

It should also be noted that family members who were not influenced by the alienating parent's use of parental alienating behaviors reportedly played a positive role in facilitating reunification.

> *… the greater support of the family network was the big contributing factor to just making [reunification] easier and more comfortable … They'd invite me over for dinners and we'd have good family get togethers … so that was a big help.*

Physical distance

Two adult alienated children reported that physical distance from their targeted parent interfered with reunification.

Adult alienated child relationships

Adult alienated children described the nature of their personal relationships throughout the reunification process. Three subthemes emerged from their descriptions.

Connection between adult alienated child and targeted parent

Eight Adult alienated children described how the targeted parent was unfamiliar to them throughout reunification. They described a lack of parent–child attachment bond.

> *I don't love [my targeted parent] … It's just, there's nothing there … There's no bond there at all…And that's brought about by the fact that … I had no contact with him my entire life until I was already an adult.*

Others described a distant, uncomfortable, or strained relationship.

> *[My targeted parent's] so much like me … and I just love that. And the tenderness that we have, because the tenderness is there but … the physical attachment … you just don't have the naturalness of it.*

Five adult alienated children reported that they did feel an attachment to their targeted parent. The attachment took the form of a parent–child bond, or a mutual love and understanding.

> *I don't actually have to start from scratch establishing a relationship with my [targeted parent] … it's not really from scratch because, you know, as buried as it is we do have a bond … because she's my mother.*

Attachment was also described as noticed similarities in appearance or personality between the adult alienated children and targeted parent.

> *I wasn't like [my alienating parent] and my sister. And then when I met my [targeted parent], and I was like, 'wow, alright, I'm like my [targeted parent] …'*

Reunification requires time and effort

Five adult alienated children explained that reunifying with their TPs required considerable effort from both parties over a protracted period of time. For some, the reunification process spanned decades and involved periods of contact and withdrawal. Adult alienated children referred to effort as needing to be reciprocal and sustained to maintain the relationship.

> *I think that human beings being as complicated and complex as they are, nothing is clear cut and this concept that you describe as reunification, you know, it's kind of like - doesn't happen easily. It's something that has to have considered thought and energy put into it. Like all relationships.*

Difficulty for adult alienated child to trust

Four adult alienated children reported that they had difficulty trusting others throughout the reunification process. They attributed this to the negative effects of parental alienation and parental alienating behaviors. Four adult alienated children also described that mistrust was internalized and reported having difficulty trusting themselves—their own thoughts, judgments and feelings.

> *You're constantly having to evaluate, 'should I or shouldn't I?', 'can I or can't I?', 'what does this mean?', 'what's the ulterior motive here?', 'is this genuine? Is this not genuine?' … You know, decades later I have that problem … [My targeted parent] was always very, very genuine, but I had the conflict of, 'do I or don't I?'*

The role of communication in reunification

Adult alienated children described the role of communication in reunification. This included communication between the adult alienated children and targeted parent and communication between the adult alienated children and alienating parent. Three subthemes were identified.

Lack of communication skills to facilitate reunification

Four adult alienated children said they did not have the communication skills to facilitate reunification, and neither did their targeted parent.

> *I think [parental alienation] was a topic that everybody found very difficult to discuss. Obviously because it was so fraught with … all the things that had gone on and I think it's a skill, it's a learned skill to be able to communicate about topics that are difficult and emotionally charged. And when you haven't got people around you that are capable of that then everybody just learns to shut down.*

Types of communication that facilitate reunification

From all the interviews with adult alienated children, three key communication strategies used by targeted parents appeared to be the most helpful in facilitating successful reunification—objective, persistent and compassionate communication. These strategies appear to be important to building trust.

> *But I just think, [my targeted parent] being open, honest, he didn't shy away from any questions, just that open communication and his gentleness was, he wasn't defensive, he wasn't as I would call, or [my alienating parent] said, 'but, you did this, this and this', you know, [my targeted parent] would tell his side of it, not demean [my alienating parent] in any way. I think that was probably a huge part that helped me be more trusting of him.*

Persistent (but not unnecessarily frequent) attempts at communication by targeted parents reportedly helped to facilitate reunification. Forms of attempted communication included phone calls, messages, letters, and attendance at events.

> *I think parents that reach out every day, and text every day, it's a bad move. It's very easy to become numb to it. It's like no big deal. I think the fact that [my targeted parent] did reach out on occasion, even though I didn't like him, and I was angry at him, I think that he couldn't be forgotten because he was showing up.*

Some adult alienated children advised that they were not aware of their targeted parent's attempts at communication, due to the influence of their alienating parent. However, learning about these attempts through the process of reunification was also helpful in facilitating reunification.

> *[My targeted parent] handed me … a stack … probably 10 inches of paperwork, and he just gave it to me, I didn't ask for it, he was just like, you know, 'here is everything I've kept over the years.' He did go to my high school graduation, I just didn't know he was there … I was a sobbing mess by the time I got done with reading through all that stuff. So, I think it was that he wasn't telling me what I should get out of that paperwork.*

Types of communication that hinder reunification

Adult alienated children made note of three communication styles used by themselves, their targeted parents and alienating parents that hindered reunification—avoidant or reactive, past-focused, and confrontational communication. Five adult alienated children reported that if targeted parent or alienating parent were avoidant or reactive to conversation around alienation, it hindered the adult alienated children's ability to consolidate their relationships.

> *I was questioning things, and sometimes I could talk to my [alienating parent] or my [targeted parent]. I could talk to them about certain things but quite often, I could ask them something and it would set them off and they'd go into a fury. Either my mother or my father, both of them, it would hit a nerve. So, I very quickly learnt that it was best to leave those subjects alone.*

Five adult alienated children also referenced past-focused communication by their targeted parents as being a hinderance to reunification. Adult alienated children found these conversations emotionally challenging and they contributed to their own sense of mistrust and defensiveness.

> *He'd [targeted parent] say 'oh, do you remember that house I used to live in, and you used to come and would swing on the swing and this tree' and he can remember it all vividly and basically, I called him a liar because I couldn't remember anything.*

Two adult alienated children reported being confrontational in their approach to communicating with their targeted parents, which created more distance in their relationship.

> *I had no empathy when I met with my [targeted parent] … I was just basically saying, 'well why didn't you call me? How come you never sent me any birthday gifts? Why didn't …' And I hammered her with all these things and um, she said 'you're exactly like your father'.*

Adult alienated children's understanding of alienation post reunification

Adult alienated children shared their understanding of parental alienation after having reunified with their targeted parents. Reflections were divided into five sub-themes.

Withholding blame for alienation

Seven adult alienated children stated that they did not blame either parent for their alienation after reunification. Instead, they accepted both parents for who they are and could see both perspectives. They no longer felt obliged to choose between them.

> *As an adult, I realise that people are flawed, and my parents are flawed. And it's not that my mum was all good and my dad was all bad. People are complicated.*

Lack of ideal parental relationships

Five adult alienated children acknowledged that the nature of their relationships with their parents were not their version of ideal.

> *But I have to say, on hindsight, I mean, I didn't have as good a relationship with my dad as I would have liked, and I haven't had as good a relationship with my mother as I would have liked. It's been turbulent for me with both my parents.*

Sympathy for parents

Four adult alienated children expressed sympathy for one or both of their parents. They described that post reunification they were able to appreciate the negative effects of alienation on their targeted parent. One expressed sadness for their alienating parent, recognizing that their behavior was a product of their own upbringing.

> *I probably have more sadness for [my parents] than I do for myself … especially my [alienating parent] now knowing what she went through when she was growing up, and that she was just merely a product of … what had been done to her. I think both my parents could have had happier lives, but … this parental alienation is very powerful. And it's very damaging and it affects a lot of people.*

Reflections on alienating parent behaviors

Three adult alienated children reflected on parental alienating behaviors. They discussed being turned against their targeted parent

and not having had the opportunity to develop a relationship with them.

> *The issue that I've always had with my [alienating parent] as an adult and on reflection of what the choices were that were made, was that I wasn't considered in the situation. My needs as the child and my needs as having or needing to have a relationship with my [targeted parent] were not considered. So, [my alienating parent] didn't see the importance or the value of me needing to have a relationship with my [targeted parent].*

Guilt and shame

Three adult alienated children expressed feeling some level of guilt and shame.

> *I would say that I felt guilty. I'm not sure that was mine to own, but I felt guilty that [my targeted parent] had to experience [parental alienating behaviours].*

The role of therapy in reunification

Three adult alienated children reported having attended therapy to discuss reunification. Two adult alienated children described benefiting from therapy because they learnt how to understand their own feeling and how to view their parents as equals.

> *I feel very grateful that I had the therapist I did … she was the one who helped me to see … my parents equally. I had always, you know, my [alienating parent] was up on this pedestal up here and my [targeted parent] had been down here, and she kind of brought them equal.*

Targeted parent experiences of reunification

Three themes were identified in the analysis of 12 TP interviews including: (1) what is reunification, (2) factors impacting reunification, and (3) life post-reunification. Several sub-themes and sub-subthemes were identified.

What is reunification?

TP definitions of reunification were varied. Four sub-themes relating to four aspects of reunification were identified.

Reunification is subjective

All targeted parents considered themselves to be reunified with their adult alienated children, however the type of relationship and level of contact with their adult alienated children varied. In some cases, the adult alienated children resided with their targeted parent full-time, some lived with their alienating parent, and some lived alone. Contact between the targeted parent and adult alienated child ranged from daily to occasional contact. Some targeted parents had been reunified with their adult alienated children for years, whereas others had only been reunified for several weeks.

The catalyst event

All targeted parents reported that reunification was a decision that their adult alienated children made following a catalyst event. Two targeted parents reported that people in the adult alienated child's life prompted the adult alienated child to make contact. The prompting appeared to take the form of the person asking curious questions about their relationship, or lack thereof, with the targeted parent.

> *You just never know, it could be the flick of a switch, that something can happen and it's a trigger. The trigger was my son's [alienated adult child's] mate. He said, 'what's the deal with your mum, you never talk about her?' And that's what triggered him … And he's like, 'well why don't you go see her, why don't you reach out to her?'*

For another targeted parent the catalyst for reunification was that parent being diagnosed with a degenerative disease. Other targeted parents speculated that it was the adult alienated child's age and increased independence which prompted their contact.

Reconciling with extended family and friends

Five out of 12 targeted parents discussed how the adult alienated child reconnecting with extended family and friends was part of the reunification process. Targeted parents reported that alienation extended to family and friends and so did reunification.

> *She [adult alienated child] saw my mother for the first time in more than three years on Saturday. And she's seen her aunt. So gradually she's starting to see other people from our family and making future plans to them.*

Reunification is a process

All targeted parents described spending significant time and effort trying to repair the fractured relationship with their adult alienated child prior to successfully reunifying. They described how letters, cards, gifts, emails, text messages, and phone calls were consistently unanswered for years before contact became reciprocal. One targeted parent reported driving 2 h every Christmas, Easter, and birthday over the course of a decade to spend 5 min with her child and hand over gifts, before driving 2 h home.

Some targeted parents spent years in the family court, accumulating significant debt in the process, to no avail. Others described their child as being abusive toward them during the reunification process. For seven targeted parents, reunification after a catalyst event was immediate. For five targeted parents, reunification was a protracted process characterized by periods of reconnection and withdrawal by the adult alienated child.

> *It's been a real rollercoaster, and she's come back I think about five times and then gone again, so it-it's been a process. It's not just suddenly, 'Mom, I'm sorry', you know, 'I really didn't mean to, I love you' then we're all ok. It hasn't been like that at all. It's been really, like, one step forward two steps back. For years … it's been a good six or seven years…*

Some targeted parents speculated that the withdrawal occurred because they challenged their adult alienated child in some way, such as enforcing boundaries, or because they would not give in to their

adult alienated child's demands (e.g., to purchase a new car). One targeted parent said their adult alienated child withdrew because their child said they missed their siblings who still lived with the alienating parent. In this instance, the targeted parent said the alienating parent prevented the adult alienated child from communicating with their siblings while they were maintaining contact with the targeted parent.

Factors impacting reunification

All targeted parents identified factors that impacted the reunification process. Two sub-themes emerged.

Factors that helped reunification

Ten targeted parents said support from others helped to facilitate reunification. Others included joining a parental alienation support group, speaking to other targeted parents, seeking counseling, and receiving emotional and practical assistance from friends and family members.

> *The other things that really helped were seeing a family therapist who specialises in this area and going to parental alienation support groups… It makes a big difference to talk to people who have been there.*

Nine targeted parents described learning about parental alienation, parental alienating behaviors and reunification. They reported that reading about parental alienating behaviors allowed them to understand what was happening to them and why their child had rejected them. This knowledge was considered an essential part of maintaining their own mental health during the alienation and subsequent reunification process.

> *Oh, in the early time I had no idea about parental alienation and so it was hell, because I thought 'what is going on' … you start going crazy because you had this fantastic bond with your kid, and then … it just explodes and you think, this is impossible!…you read up on parental alienation and it's like a light-switch and you think 'thank god, there's something out there which explains this' … That was a real life-saving moment for me.*

For some targeted parents, meeting other targeted parents, recently reunified targeted parents and other adult alienated children provided them with insight into a child's perspective of parental alienation. Some targeted parents said this insight was instrumental in shaping how they coped with the alienation and managed the reunification process.

Eight targeted parents said starting afresh with their adult alienated children was helpful in the reunification process. This involved maintaining a focus on the present rather than dwelling on the past. Targeted parents also said rebuilding the relationship with their child at their child's pace, providing a happy and loving home environment, avoiding talking about the past, and making a conscious effort to display at least neutral feelings toward the alienating parent all helped the reunification process. They also said it was important to resist the temptation to disclose details of their experience during the alienation because this creates conflict and can result in the adult alienated child withdrawing from them. All targeted parents noted that it was important to move on from the alienation and accept that their child may be unable to provide them with explanations for their rejection.

> *I was over the whole thing. I wasn't angry at anybody … Reconnecting with my son was not about me. It wasn't about, you know, getting an apology from him. It wasn't about getting any kind of validation that … I wasn't such a horrible human being. It wasn't anything to do with me. It was just solely about him and the present and the future … I remember in the beginning he used to call me by my first name and, you know … I had a choice to make … do I get annoyed and angry and upset because he's calling me by my first name? Or do I just let it go? I decided to let it go … He hasn't talked to me for twelve years, now all of a sudden he's talking to me. It's like am I going to get hung up over that fact that he's calling me by my first name instead of saying 'Dad'? No.*

Factors that hindered reunification

Seven targeted parents observed that their adult alienated child's mental health hindered reunification. They described their children as being emotionally dysregulated, fearful, anxious, aggressive, controlling and/or submissive. Targeted parents attributed this to the unhealthy and harmful relationship adult alienated children had with their alienating parent.

> *… he (adult alienated child) would put his hands on his head, and he'd say, 'I don't know why I keep doing this,' he said, 'I just don't know, I just get this feeling of being angry and I just want to blame you.'*

Ten targeted parents described how the "system," namely family law courts, was ineffective in facilitating reunification. The targeted parents blamed the family law courts for failing to intervene and allowing the alienation to progress over many years. They explained that practitioners within family law courts are inadequately educated on parental alienating behaviors and consequently, the needs of the alienated child go unseen.

> *Once they're over the age of twelve it's so-called children's wishes. So even though the courts knew that her father had got her to make those gross allegations, there were no consequences and he refused to do any court ordered family therapy.*

Targeted parents reported that the process of going through the family law court to reunify with their child, facing the alienating parent and defending themselves against false allegations made by the alienating parent had significant impacts on their mental health.

> *The family law court … that was a horrible, horrible, horrible experience … I really did want to kill myself going through that … I think I've got PTSD from that … I try and … not to talk about that.*

Seven targeted parents were still alienated from at least one of their children, which hindered the reunification process with the child who had initiated reunification. These targeted parents described trying to cope with being a parent to the reunified child, while grieving for their other alienated child/ren.

> *People think that because I have one child back that I am lucky and everything is great, but you know, it's like, I've got two children. And I still grieve the same way I grieved when I didn't have both of them in my life.*

Five targeted parents reported that their child's alienating parent continued to purposefully engage in parental alienating behaviors, hindering reunification.

Life after reunification

TPs provided insight into their lives post reunification. Four sub-themes were identified.

Feelings toward the alienating parent

All targeted parents expressed mixed feelings toward the alienating parent. These feelings included apathy, pity, fear, anger and empathy. Some participants reported disbelief that the person they had chosen to have a child with could inflict such harm upon them.

We do not speak of the alienation

Nine targeted parents reported that they did not speak about the period of alienation with their adult alienated child. They felt trepidation toward broaching the topic. This was reportedly because the adult alienated child continued to defend their alienating parent. These targeted parents stated that if their adult alienated child expressed a desire to discuss the alienation, they would be willing.

> *It's kind of strange. Sometimes it's like the elephant in the room … One of the decisions I made early on if like if he wanted to talk about it, I was willing to talk about it, but if he didn't want to talk about it, you know, we weren't going to talk about it.*

The negative impacts of reunification

Six targeted parents shared that reunification had negatively impacted their mental health. For some, reunification reminded them of how much they had missed out on in their children's lives. They described the physical consequences of enduring years of distress and grief associated with parental alienation.

> *There's been a lot of impact on me … it's been incredibly physically demanding in terms of interrupted sleep and sort of the continual emotional drain of dealing with an extremely traumatised child … the whole process has felt a bit like being fried to death with my own cortisol.*

Five targeted parents also referenced the negative financial consequences of reunification. They described spending years in court trying to have a relationship with their children at great financial cost. Some described needing to cease work to care for their adult alienated child full-time, due to the child's experience of emotional and behavioral difficulties as consequences of parental alienation.

> *Like you know, some of the big picture stuff is that I've had to sell the only home I've ever owned. I've spent my superannuation … you know I'm kind of basically destitute at retirement age and that's basically because of having spent the last decade trying to protect my kids and spending vast amounts of money.*

The positive impact of reunification

Seven targeted parents referred to the positive impact reunification had on their lives. They said meaning had been restored in their lives.

> *I feel more complete. I've got my sense of purpose back. I can mother him, cook for him and do things. Now it's not just the cat and dog, I've got my son … it's part of having that purpose again. Feeling like I'm a mum again.'*

Discussion

The study explored the experience of voluntary reunification post alienation from the perspectives of adult alienated children and targeted parents. The findings provide further insights into the process of reunification, how it occurs, and how it can be supported.

Defining successful voluntary reunification as a child-driven process

Voluntary reunification is defined in the literature as a process that occurs when an adult alienated child actively seeks to restore a relationship with their targeted parent without a court mandate or reunification therapy (Darnall and Steinberg, 2008b). In the current study, all targeted parents reported that reunification was initiated by their adult alienated child, and it was a child driven process. Targeted parent and adult alienated child participants described reunification as a protracted process, sometimes across many years with phases of contact and withdrawal by adult alienated children. This is consistent with Rand and Rand (2006) who described reunification as a fragile process. The apparent approach-withdraw cycle seen in the experiences of participants in the current study can be understood using attachment theory.

When parental alienating behaviors result in the eradication of the targeted parent from the alienated child's life, this attachment bond is damaged along with the child's attachment system. The alienated child's attachment system may be further impacted by the nature of their relationship with the alienating parent. If this relationship is unstable in some way, the child is then unable to experience a secure base from the other attachment figure (Haines et al., 2020). Consequently, adult alienated children may be wary of the targeted parent until regular contact recommences, there is an opportunity for repair of the relationship and trust is built (Haines et al., 2020). For the attachment bond to be strengthened the adult child needs to have warm, involved, and continuous contact from the targeted parent. The approach-withdraw process of reunification could be the way in which the adult alienated child begins to explore their relationship with their targeted parent. It may be a process of testing the waters, seeing if they are safe, withdrawing when overwhelmed and unsure, and reapproaching when ready. The need for the targeted parent to be a secure base and a source of reliable comfort is essential during this process (Haines et al., 2020). The current study's findings suggest that adult alienated children need to be in control of the reunification process for it to be successful. This may be because much of the parental alienation process is outside of their control. These findings mirror literature on the importance of empowering survivors of child

abuse to take the lead in their own recovery (van Loon and Kralik, 2005).

Frequency of contact, quality and depth of relationship

The current study found that targeted parent–child relationships during reunification varied in the amount, quality, and depth of contact. Relationships were described on a spectrum of unfamiliar, distant, lacking a bond, and having difficulties with trust, to feeling degrees of connectedness and mutual love. Darnall and Steinberg (2008a) similarly reported that the targeted parent–child relationship during the reunification process can vary in intensity over time.

It is suspected that fluctuation may also be due to factors including the age of the alienated child at the commencement of parental alienation. If a child is very young, they may not have the opportunity to solidify an attachment bond with the targeted parent prior to being alienated from them. Other possible factors impacting reunification include the severity of the parental alienating behaviors and readiness of the child to reunify. Further, the psychological functioning of the adult alienated child and targeted parent during the reunification process may impact on reunification outcomes. Further research is required to explore these factors to determine causation.

Readiness of the adult alienated child

Consistent with previous research (Rand and Rand, 2006; Baker, 2007; Darnall and Steinberg, 2008a,b), there are a number of possible catalysts for reunification. The most consistent trigger for a resumption of contact was the adult alienated child's readiness to do so. Readiness centered on a willingness to accept and love both their parents following parental alienation, and to a explore a relationship with their targeted parent in search of a resolution to the alienation. Intrinsic changes within the adult alienated child (e.g., maturation or reframing inaccurate beliefs about the targeted parent) may lead to reconnection (Rand and Rand, 2006; Baker, 2007; Darnall and Steinberg, 2008a,b).

Factors that influence reunification

Participants identified several factors that influence reunification. Factors that hindered reunification included the ongoing influence of parental alienating behaviors, the adult alienated child's capacity to trust the targeted parent, geographical distance between the adult alienated child and targeted parent, and the way in which the targeted parent behaved during the reunification process.

Findings illustrate the pervasive nature of parental alienating behaviors, and that parental alienation is not just an experience limited to childhood. Parental alienating behaviors continue to impact the child well into adulthood affecting their ability to re-connect and consolidate relationships with their targeted parent. To assume the child will simply reconnect with the targeted parent when they are an adult is erroneous (Templer et al., 2017). The influence of parental alienating behaviors is enduring and traumatic, and the subsequent reunification process is complex (Haines et al., 2020; Verhaar et al., 2022).

These findings can be understood in the context of family violence. Abusive behaviors, particularly coercive control, are pervasive (Candela, 2016). If parental alienating behaviors are considered abusive behaviors, it is unlikely that these behaviors will abate simply because the child has become an adult. Perpetrators of family violence do not easily surrender their power and control (Candela, 2016).

Consistent with the experience of child abuse survivors, some of the adult alienated child participants in this study described having difficulty trusting themselves and others during the reunification process. These trust difficulties reportedly slowed the reunification process. Other studies have also found lack of trust in self and others may be a long-term consequence of being exposed to parental alienating behaviors in childhood (Baker, 2007; Bentley and Matthewson, 2020; Verhaar et al., 2022). This lack of trust may be due to being told by a parent that their other parent is unavailable, unloving and/or threatening in some way contrary to their own experiences of their other parent. Losing that attachment figure and remaining in the custody of an attachment figure who is using coercive control makes it difficult for the child to not only trust others, but to trust their own judgment and perceptions (Harman et al., 2021; Verhaar et al., 2022).

For both the adult alienated child and the targeted parent, exposure to parental alienating behaviors and parental alienation are traumatic experiences (Haines et al., 2020; Verhaar et al., 2022). This study showed that the reunification process may be influenced by the psychological functioning of the targeted parent and adult alienated child. The results suggest that, while the reunification process needs to be largely driven by the adult alienated child, how the targeted parent is functioning and able to cope with the approach and withdraw pattern of that process is important. A person who has experienced psychological trauma can experience hyper and/or hypoarousal. In these states, a person's body detects threat and is primed for survival, which can prevent social engagement. If a traumatized person does not have the means to regulate themselves or have a stable base with which to co-regulate, dysregulation may persist, or become heightened (van der Kolk, 2003). If the adult alienated child and targeted parent are unable to manage their trauma reactions their capacity to build a trusting relationship will be hindered. The results also suggest that if the targeted parent can provide a secure base and the adult alienated child is ready and able to receive it, trust and co-regulation may be possible.

The targeted parent's own coping may influence their ability to effectively communicate with their adult alienated children. Communication was found to be an important factor in the reunification process. It appears if targeted parents are avoidant, reactive, past-focused, and confrontational in their communication with the adult alienated child, trust cannot be built, and the reunification process is hindered. This is because adult alienated children may find conversations of this nature emotionally challenging, dysregulating, and destabilizing (Bentley and Matthewson, 2020; Haines et al., 2020). This is consistent with Warshak (2010), who recommended that targeted parents "strike while the iron is cold." This means it is important for targeted parents to resist the urge to have or persist with confronting topics of conversations with their adult alienated children when the adult alienated child is ready and not when they are having strong emotional reactions.

Additionally, the current study also revealed that other people aside from the alienating parent (e.g., siblings, stepparents, extended family, and friends) interfered with the reunification process. This is

consistent with Haines et al. (2020) who highlighted that families consist of more than parent–child triads and extended family can indeed be involved in facilitating parental alienation, but they can also be important in facilitating reunification.

Factors that helped reunification included support from family, friends, peers, and mental health professionals, increased education and understanding of parental alienation, objective, present-focused and persistent communication, and a willingness for some to "start afresh." The findings indicate that targeted parents and adult alienated children benefit from understanding parental alienation, parental alienating behaviors and their own experience of these when approaching reunification. Participants in this study described how knowledge and the support of others helped them to heal from their traumatic experience so they were able to reconnect with another person, who had also had a traumatic experience.

Impacts of reunification

Adult alienated children and targeted parents described the consequences of reunification on their lives. Adult alienated children reported developing a sense of acceptance and understanding of their circumstances and the people involved. They learnt to withhold blame for the alienation and have sympathy for both parents. They learnt to have healthier critical thinking skills and recognize that their relationships with their parents are complex. Adult alienated children brought guilt and shame into the reunification process that needs to be explored further in future research. Adult alienated children's experience of guilt and shame should not be overlooked if they seek therapeutic support before, during or after reunification.

Some targeted parents described their lives as being enriched and regaining meaning through re-establishing a relationship with their child. This finding is consistent with posttraumatic growth theory, which proposes that some people can make meaningful and positive changes as a result of traumatic experiences (see Calhoun et al., 2010; Tedeschi et al., 2018). Other participants described having difficulty parenting their adult alienated children post-reunification due to their mental and physical health and financial situations. Targeted parents in the current study needed to manage their own mental health during reunification while supporting their adult alienated children who were often equally as traumatized. They needed to learn how to parent a traumatized adult who is very different to the child they last saw before being alienated from them. These findings suggest that therapeutic support during the reunification process should be considered by the adult alienated child and targeted parent. It is important that the adult alienated child and targeted parent have available to them a wealth of healthy self-care strategies and the capacity to implement healthy boundaries.

Clinical implications

For practitioners to support families during voluntary reunification, it is important that they have a good understanding of parental alienating behaviors, parental alienation, and their impact. The current study identifies specific areas on which intervention and support frameworks for reunifying families can be based. Based on the findings and consistent with Haines et al. (2020), it is recommended that adult alienated children and targeted parents seek therapeutic and social support so they can start to heal from their trauma, address unresolved grief, shame, and guilt, and learn how to establish healthy patterns of communication and interaction. Therapeutic approaches need to be trauma informed and may include trauma and grief processing, family of origin work to understand the intergenerational transmission of trauma to reduce blame, acceptance practices, cognitive restructuring, assertiveness training, coping skills training and parenting support.

Limitations and directions for future research

The size of the current study's sample was relatively small. Nonetheless, it was robust due to the richness of data and having met data saturation. It is recommended that future research include data from a larger sample involving qualitative and quantitative methods to increase generalizability of results and to further explore casual relationships between the variables that might predict, mediate and/or moderate reunification outcomes.

The qualitative data provided by participants in this study are considered by the researchers to be a true interpretation of their experiences, however, it is important to acknowledge that adult recall of past experiences is subjected to self-report bias. Memory of past events can be influenced by the passage of time, suggestion, and personal biases (Kensinger, 2009). This is a limitation inherent in qualitative research, however, the richness of the data obtained in this study is valuable and insightful. This is because adults can provide rich and detailed information about their memories, emotions, and perception of their experiences regardless of their age (Kirkegaard Thomsen and Brinkmann, 2009). Future research may aim to obtain information from collateral sources or using a longitudinal design to enhance the robustness of the research.

In terms of vulnerability to parental alienation, some research suggests that there are no significant differences between male and female adult alienated children (Baker and Darnall, 2006; Baker, 2010a). Other research indicates that females may be more vulnerable (Balmer et al., 2018). Similarly, the literature suggests an equal prevalence of targeted mothers and fathers (Balmer et al., 2018). Based on limited literature, it is unclear as to whether these distributions also apply in cases of voluntary reunification. The current study is based on a majority female sample of adult alienated children and targeted parents, therefore, it may not accurately capture the voluntary reunification experience of male adult alienated children and targeted parents and the experience of people who are gender diverse. It is recommended that future research include more gender-varied samples. This will create opportunities for the assessment of gender differences and recommendations for tailored intervention.

In the current study, the length of time adult alienated children were alienated from their targeted parents and the length of time since reunification were estimated in collaboration with participants. This is because some adult alienated children had difficulty quantifying their alienation and reunification experiences. Demographic information may have been impacted

by the participants' memories of past events. This may have been the result of some participants needing to protect themselves from past traumatic events (Goodman et al., 2010), the outcome of parental alienating behaviors (Baker, 2005a,b), and/or a combination of both factors. The influence of recalling past traumatic events cannot be ignored as a possible limitation of the study's findings. It is recommended that future research be conducted longitudinally, following the trajectory of families post separation and beyond to limit data reliance on past recall. It is also suggested that future research include collecting information from collateral sources and information from members of the wider family system.

A limitation inherent in all qualitative research is the potential for researcher bias. Attempts were made to safeguard against this by approaching data analysis from an inductive data-driven stance and by using multiple coders to ensure inter-rater reliability. To enhance generalizability of future research, it is recommended that studies use a multimodal approach. Despite these limitations, the current study offered unique insight into the voluntary reunification process following parental alienation.

> "*Rebuilding the parent-child relationship when the child is an adult requires commitment and patience. The process is fragile, and vulnerable to breaking down. The desire of parent and child to reconcile must be strong enough to work through the powerful emotions which stand in the way, such as fear, anger, and guilt.*" (Rand and Rand, 2006, p. 164).

Data availability statement

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

Ethics statement

This study was reviewed and approved by the University of Tasmania Social Sciences Human Research Ethics Committee. The participants provided their written informed consent to participate in this study.

Author contributions

MM coordinated and oversaw all aspects of the research. JB, JH, and SW conducted the interviews. MM, JB, JH, and SW conducted the data analyses. All authors contributed to writing the manuscript.

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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.

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Parenting stress and Chinese preschoolers' approaches to learning: a moderated mediation model of authoritative parenting and household residency

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According to the family stress model, this study examined the relationship between parenting stress and preschoolers' approaches to learning (ATL) in China, as well as the mediating effect of authoritative parenting and the moderating effect of household residency (migrant and native). A survey of 5,047 preschoolers' parents (2,186 natives and 2,861 migrants) supports the proposed moderated mediation model. The results showed that after controlling for gender and age, parenting stress affected preschoolers' development of ATL negatively. Authoritative parenting mediates the relationship between parenting stress and preschoolers' ATL. Further, household residency moderated the relationship between authoritative parenting and preschoolers' ATL. The findings of this study suggest that high levels of parenting stress are detrimental to the development of preschoolers' ATL. And parents with low parenting stress are more likely to adopt authoritative parenting, which in turn fosters preschoolers' ATL. In addition, native families' authoritative parenting style are more conducive to fostering preschoolers' ATL than migrant families. Finally, this study contributes to previous research by examining the mechanisms of parenting stress on preschoolers' ATL and provides support for the extension of the family stress model. Importantly, it also informs efforts to improve ATL among preschoolers in Chinese migrant and native families.

KEYWORDS

parenting stress, Chinese preschoolers' approaches to learning, authoritative parenting, household residency, parenting style

Introduction

Over the past years, approaches to learning (ATL) has attracted considerable attention and become a common demand in early childhood education in developed countries (Moffett et al., 2023; Stephens et al., 2023). ATL refers to children's attitudes, habits, learning styles, and behaviors as they engage in educational activities and achieve goals (Kagan et al., 1995; McDermott et al., 2016). Specifically, they describe how children learn rather than what children have learned. Up to now, many studies have explored the factors of ATL. For example, in the Early Childhood Longitudinal Study-Kindergarten Class of 1998–99 (ECLS-K), ATL includes

factors such as organization, attentiveness, learning independence, persistence, flexibility, responsibility, and creativity (U.S. Department of Education and National Center for Education Statistics, 2002). In addition, Scott-Little and colleagues' research suggested that ATL's factors include curiosity, initiative, persistence, attentiveness, etc. (Scott-Little et al., 2006). Moreover, it has been confirmed by most researchers that ATL involves critical factors such as curiosity, initiative, persistence, and creativity. There is currently a substantial body of longitudinal studies suggests that ATL is essential to children's later academic achievement, including reading, vocabulary, language, mathematics, science, etc. (Li-Grining et al., 2010; McClelland et al., 2013; McDermott et al., 2014; Bustamante et al., 2017; Sung and Wickrama, 2018). Interestingly, prior research has proven relationships between ATL and other aspects of children's development, such as peer relationships, social competence, and executive function, etc. (Coolahan et al., 2000; Razza et al., 2015; Sung and Wickrama, 2018; Moffett et al., 2023). Furthermore, some previous studies have suggested that early ATL may serve as a source of resilience for children who have been exposed to risk factors (Luthar et al., 2000; Li-Grining et al., 2010). Hence, it is crucial to recognize and foster ATL, especially as they emerge in the key preschool years (McDermott et al., 2002).

There is no doubt that various family factors influence children's development in different ways. According to the extension of the family stress model, parents' psychological distress can influence a child's outcome via disrupted parenting (Conger et al., 2002; Masarik and Conger, 2017). In spite of the fact that the family stress model has historically focused on economic stressors, it can also be applied to other stressor variables including parenting stress (Masarik and Conger, 2017; Marcal, 2022). Further, previous studies have shown that parenting stress can negatively affect the ATL of children (Chazan-Cohen et al., 2009; Smith-Adcock et al., 2019). Moreover, a longitudinal study has reported a link between lessening parental stress and better ATL for the first 5 years of a child's life (Chazan-Cohen et al., 2009).

However, the influence of parenting stress on preschoolers' ATL has not been fully explored. Preschoolers' ATL may be affected directly or indirectly by parenting stress. Directly, children are sensitive to their parents' emotional states, so when their parents experience high levels of stress, they may also experience tension, stress, or anxiety. This negative emotion can hinder their motivation and willingness to learn (Chazan-Cohen et al., 2009; Herba et al., 2016; Smith-Adcock et al., 2019). Indirectly, parenting stress may reduce parent-school involvement and the quality of parent–child interaction, lead to maladaptive parenting behaviors such as punishment and harsh response, and especially lead parents to be more authoritarian or permissive toward their children, which in turn affects preschoolers' ATL (Fonseca et al., 2020). In addition, little research has been done into a moderated mediation model that incorporates ATL, parenting stress, and other family factors. Guided by previous research, in the current study, we draw from the family stress model to build a comprehensive model that links parenting stress to authoritative parenting style, preschoolers' ATL, and household residency (Chinese migrant families and native families). As well as further investigate how parenting stress affects preschoolers' ATL. In addition, we further reveal the potential mediating roles of the authoritative parenting style in the association between parenting stress and preschoolers' ATL. Further, we also examine whether household residency may serve as a moderator of the relationship between authoritative parenting and preschoolers' ATL. Specifically, we examine which household residency in the cities may enhance the positive effect of authoritative parenting on preschoolers' ATL. Lastly, our study provides significant recommendations regarding preschoolers' ATL in Chinese migrant and native families.

Literature review and hypotheses

Parenting stress and preschoolers' approaches to learning

The concept of parenting stress is generally understood to be a negative psychological reaction that occurs when parents are not able to meet their parenting needs and concerns about their role as parents (Deater-Deckard, 1998). Our study focuses on parenting stress in parents of preschoolers because this developmental period poses a number of challenges for them (Harmeyer et al., 2016). Although many parents experience parenting stress, multiple studies show that high parenting stress can lead to a range of child development problems (Fang et al., 2022). When parents are experiencing high levels of parenting stress, they may become less responsive, inconsistent, or harsh to the needs of their children (Crnic and Low, 2002). These negative parent–child interactions can result in a variety of children's developmental problems, including difficulties with adjustment, problem behaviors, language delay, sleep problems, and negative emotions (Deater-Deckard, 1998; Baker et al., 2003; Horwitz et al., 2003; Martin et al., 2019). Additionally, children raised by parents with high parenting stress may have lower cognitive abilities and poor academic performance due to fewer positive learning interactions and stimulations in the family daily life (Tachibana et al., 2012). Furthermore, these negative effects caused by parenting stress during early childhood may influence preschoolers' future development (Neece et al., 2012). According to a recent study, parents' low perceived social support and negative emotions negatively affect their children's ATL (Yan et al., 2022). Moreover, low perceived social support is generally associated with parenting stress (Huang et al., 2014). Further, parenting stress, which could cause more frequent negative emotions in parents, may adversely affect the development of preschoolers' ATL (Fonseca et al., 2020). Hence, this study proposes the following hypotheses based on the information provided above:

> *H1*: Parenting stress negatively influences preschoolers' ATL.

Authoritative parenting as a mediator

When assessing parenting stress' impact on preschoolers' ATL, it is imperative to consider how parents respond to this stressful situation to reduce the negative impact on preschoolers. Multiple research suggests that parental parenting style is crucial to a child's development, particularly during the preschool years (Tan et al., 2012; Hosokawa and Katsura, 2019). Additionally, a large number of studies suggest that parental stress influences children's development through its effects on parenting (Crnic et al., 2005; Tan et al., 2012). Interestingly, a substantial amount of literature has examined that

parents with lower parenting stress are more likely to adopt authoritative parenting (Park and Walton-Moss, 2012; Gouveia et al., 2016; Fonseca et al., 2020). Most studies have described authoritative parenting as more likely to include a higher degree of restriction, responsiveness, warmth, developmental appropriateness, and support than other parenting styles (Baumrind, 1971; Robinson et al., 1995; Park and Walton-Moss, 2012; Gouveia et al., 2016). Authoritative parents pay close attention to their children's feelings and communicate with them frequently. In addition to granting their children reasonable autonomy, authoritative parents also teach them how to make wise decisions (Pinquart, 2017). Moreover, ample research has demonstrated that authoritative parenting is a type of positive parenting that fosters children's development, such as prosocial engagement, cooperation, social competence, peer acceptance, school achievement, etc. (Crnic and Low, 2002; Cheah et al., 2009). Furthermore, a recent Chinese study found that authoritative parenting can positively predict preschoolers' ATL (Xia, 2023). In addition, a systematic review indicates that parental supportive and warm behaviors can act as protective factors to increase preschoolers' appropriate behaviors and decrease problematic behaviors when parents face high levels of economic stress (Masarik and Conger, 2017). Based on the above, authoritative parenting may serve as a protective factor buffering the negative impact of parenting stress on preschoolers' ATL development. However, to date, only a few studies have explored the relationship between authoritative parenting style in terms of parenting stress and preschoolers' ATL. As such, this study proposes the following hypothesis:

> *H2*: Authoritative parenting mediates the relationship between parenting stress and preschoolers' ATL.

Household residency as a moderator

In recent years, as the Chinese economy has developed rapidly and urbanization has accelerated, the number of Chinese migrants from rural areas to urban areas has increased (Yang, 2013). Although migrants are generally defined as having crossed national borders, it is necessary to examine the impact of rural–urban migration on the development of preschoolers due to the enormous urban–rural divide in China (Yan et al., 2022). In this study, a migrant family is one in which both parents have rural residency and have lived in the city for more than half a year without obtaining a long-term residence permit. Moreover, there is considerable literature arguing that migrant and native parents have different parenting beliefs and behaviors, especially when it comes to their children's education (Fibbi and Truong, 2015). Specifically, migrants may differ from native parents in terms of parenting self-efficacy, attitudes toward their children's education, expectations, resources, involvement in their children's daily activities, provision of cognitive stimulation, attitudes toward their children's abilities and performance, etc. (Barglowski, 2019). Further, it has been demonstrated in previous studies that these differences can impact children's development, particularly their ATL development (Padilla and Ryan, 2020). Accordingly, parenting outcomes and preschoolers' ATL development may be significantly different in these two household residencies. Furthermore, according to Mistry and colleagues' study, household residency can also serve as a moderator (Mistry et al., 2008). Thus, the present study predicts household residency might moderate the association between authoritative parenting and preschoolers' ATL and proposes the following hypothesis:

> *H3*: Household residency moderate the mediating effects of authoritative parenting style in the relationship between authoritative parenting and preschoolers' ATL. Specifically, we propose that native parents' authoritative parenting might be more effective than migrant parents at fostering preschoolers' ATL.

Present research

The current study proposes a moderated mediation model (see Figure 1) on the basis of the theory of the family stress model. This study aimed to examine the relationship between parenting stress and preschoolers' ATL. Furthermore, we also investigated how authoritative parenting plays a mediating role in parenting stress' effect on preschoolers' ATL. In this vein, how the influence of authoritative parenting on preschoolers' ATL may differ based on household residency (migrant or native) was also explored.

Materials and methods

Participants

Using the convenience sampling method, this study selected parents from preschools that comprised both migrant and native preschoolers in Guangzhou, Foshan, and Shenzhen cities in southern China. We distributed 5,400 questionnaires and collected 5,047 valid responses, resulting in an effective response rate of 93.46%. The valid subjects included 2,186 native parents and 2,861 migrants. We obtained informed consent from all participants, and the Guangzhou University School of Education and related research ethics committee evaluated and approved the research. Specific demographic information is shown in Table 1.

Measures

Parenting stress

Parenting stress was assessed using the Chinese version of the Parenting Stress Index – Short Form (PSI-SF) (Abidin, 1995). Developed from the original Parenting Stress Index (PSI), the PSI-SF is a 36-item version of the original 120-item PSI (Abidin, 1983). The PSI-SF identifies three central factors of parenting stress: parental distress, parent–child dysfunctional interaction, and difficult child. Specifically, it is a self-report questionnaire that measures the stress experienced by parents with children aged 1 month to 12 years old. Since the PSI-SF has been used by multiple nonclinical and clinical groups as well as nationally representative samples, it has demonstrated excellent validity (Holly et al., 2019). Further, it was also confirmed that the Chinese version of the PSI-SF possessed good reliability and validity. Parents were asked to read the statement and answer on a

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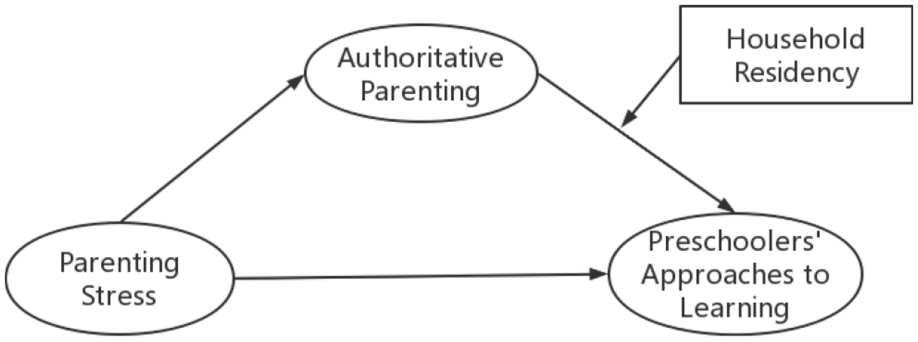

FIGURE 1
Hypothetical model.

TABLE 1 Demographic characteristics of participants (N = 5,047).

Statistical variables	Group	Frequency and percentage (%)	
		Native families	Migrant families
Number of participants	—	2,186 (43.31%)	2,861 (56.69%)
Gender of child	Boys	1,129 (51.65%)	1,532 (53.55%)
	Girls	1,057 (48.35%)	1,329 (46.45%)
Age range of child	3–4 years old	804 (36.78%)	708 (24.75%)
	4–5 years old	806 (36.87%)	998 (34.88%)
	5–6 years old	576 (26.35%)	1,155 (40.37%)
Parents' educational level	High school or below	734 (33.58%)	1957 (68.41%)
	College graduates or above	1,452 (66.42%)	904 (31.59%)
Parents' occupation	Manual workers/Unemployed	483 (22.10%)	1,445 (50.51%)
	Technical worker	54 (2.47%)	112 (3.90%)
	Self-employed/Freelancers	759 (34.72%)	712 (24.89%)
	Managers/Technicians	757 (34.63%)	508 (17.76%)
	Professionals/Executives	133 (6.08%)	84 (2.94%)
Household income (Annual)	Under 30,000 CNY (Under 4,138.79 USD)	197 (9.00%)	314 (10.98%)
	30,000–50,000 CNY (4,138.79–6,879.98 USD)	205 (9.38%)	414 (14.47%)
	50,000–100,000 CNY (6,879.98–13,795.96 USD)	433 (19.81%)	748 (26.14%)
	100,000–150,000 CNY (13,795.96-20,693.93 USD)	403 (18.44%)	574 (20.06%)
	150,000–200,000 CNY (20,693.93–27,591.91 USD)	316 (14.46%)	365 (12.76%)
	Over 200,000 CNY (Over 27,591.91 USD)	632 (28.91%)	446 (15.59%)
Residential environment	Suburb	281 (12.85%)	321 (11.22%)
	Urban village	428 (19.58%)	1,120 (39.15%)
	Older neighborhoods	482 (22.05%)	880 (30.76%)
	Apartment complex	995 (45.52%)	540 (18.87%)
Family socioeconomic status (SES)	Low family SES	584 (26.72%)	1,186 (41.45%)
	Middle family SES	645 (29.51%)	889 (31.07%)
	High family SES	957 (43.78%)	786 (27.47%)

1 USD = 7.2471 CNY (Exchange rate on July 06, 2023).

5-point Likert scale (1 is "strongly disagree" and 5 is "strongly agree"). A higher score indicates a higher level of parenting stress. In the current sample, the Cronbach's α of the total PSI-SF was 0.889.

Authoritative parenting

Authoritative parenting was measured using one subscale of the Chinese version of the Parenting Styles and Dimensions Questionnaire (PSDQ) (Robinson et al., 1995). There are four dimensions of authoritative parenting style, which are assessed by 27 items, including "Reasoning/Induction" (7 items), "Good-natured/Easy Going" (4 items), "Warmth and Involvement" (11 items), and "Democratic Participation" (5 items). A five-point Likert scale was used to assess parents' response to each item (where 1 means "never" and 5 means "always"). A higher score indicates that the parent uses authoritative parenting more frequently. It has been shown that the Chinese version has excellent internal consistency. In this study, Cronbach's alpha of the Authoritative Parenting scale was 0.94.

Approaches to learning

A commonly used tool for measuring preschoolers' ATL is the Preschool Learning Behavior Scale (PLBS) (McDermott et al., 2002). The PLBS is a 29-item scale composed of three reliable dimensions, Attention/Persistence (e.g., "Cannot settle into an activity"), Competence Motivation (e.g., "Tears when faced with difficulty"), and Attitude Toward Learning (e.g., "Unwilling to accept needed help"). In our study, we used the Chinese version of the PLBS, which showed good internal consistency in the previous study (Hu et al., 2017). It is a three-point Likert scale with three response options: 1 (does not apply), 2 (sometimes applies), and 3 (most often applies). A higher score on the scale suggests better ATL performance. In the current study, Cronbach's α of the total PLBS was 0.836.

Demographic covariates

The parents reported their child's age (1 = 3–4 years old, 2 = 4–5 years old, 3 = 5–6 years old), and their gender (0 = boy, 1 = girl). Both the child's age and gender were included as covariates.

Statistical analysis

In this study, data were analyzed using SPSS24.0, which included reliability analysis, common method bias test, descriptive statistics, and correlation analysis. We used Mplus8.3 to test structural equation models. And we tested the mediation model and the moderated mediation model using Bootstrap and multi-group comparison. Model parameters were estimated using the maximum likelihood method (ML). To assess the goodness of the model fit, we selected the following fit indices: the Tucker-Lewis index (TLI), the Comparative Fit Index (CFI), the Root Mean Square Error of Approximation (RMSEA), and the Standardized Root Mean Square Residual (SRMR). Since this study had a large sample size, the chi-square values were not used as a reference for the model fit. The cutoff values of CFI and TLI ≥ 0.9, SRMR and RMSEA ≤ 0.08 were adopted as the criteria for a good fit in the current study. And p value (p) < 0.05 was regarded as statistically significant (Kline, 2005).

To test whether household residency (native/migrant) has a moderating effect in the latter half of the mediation model, we used multi-group comparison to test the differences between groups. First, we examined the tested model between the two groups. We tested the following invariance: (1) Configural Invariance, that is, the attribution of indicators is equal among different groups; (2) Metric Invariance, that is, the loading of the indicator on the latent variable is equal between different groups; (3) Scalar Invariance, which means that the intercept of indicators is equal between different groups. In general, if the fit indexes (CFI, TLI, and RMSEA) do not change by more than 0.01, the model has not significantly changed (Meade et al., 2008). Following the testing of measurement invariance of the tested models, pathways between variables were added to the models. To test whether the pathways between authoritative parenting and preschoolers' ATL are different among two family types, this study let these pathways be freely estimated among the two groups and constrained the invariance of other pathways. To determine whether the difference is significant, the Wald Test was used to compare the difference between the two pathways. If the Wald Test result has a significance p-value of less than 0.05, it suggests that the paths are statistically different across groups.

Results

Common method bias

Although this study uses a more mature measurement tool and emphasizes the confidentiality of personal information in data collection, according to previous studies on common method deviations, a Harman one-way test is required to confirm common method deviations statistically after data collection (Podsakoff et al., 2003). It was found that there were 13 factors with feature values greater than one. The variance explained by the first principal factor was 21.54%, which was less than the critical criterion of 40%. Thus, there is no common method bias in this study.

Description statistics and correlation matrix

Table 2 presents the descriptive statistics (standard deviations and means), and correlations for the main study variables. Based on the data analysis results, parenting stress was negatively correlated with preschoolers' ATL ($r = -0.45$, $p < 0.01$). In addition, parenting stress was also negatively associated with authoritative parenting ($r = -0.37$, $p < 0.01$). Further, authoritative parenting was positively associated with preschoolers' ATL ($r = 0.35$, $p < 0.01$). Moreover, household residency was significantly associated with preschoolers' ATL, parenting stress, and authoritative parenting ($r = -0.09$, $p < 0.01$; $r = 0.16$, $p < 0.01$; $r = -0.09$, $p < 0.01$, respectively).

Testing for the mediating role of authoritative parenting

This study tested the mediating effect of authoritative parenting based on the test procedure for mediation analysis of structural equations. Further, we estimated confidence intervals for each coefficient by the Bias-Corrected Bootstrap method (Bootstrap = 5,000), with 95% confidence intervals that do not contain

zero indicating statistical significance (Shrout and Bolger, 2002). First, a simple regression model of latent variables was established to test whether parenting stress directly predicted preschoolers' ATL. The results showed that the model fitted well with RMSEA = 0.05, CFI = 0.99, TLI = 0.98, and SRMR = 0.02. It was found that parenting stress negatively and significantly predicted preschoolers' ATL after controlling for preschoolers' gender and age ($b = -0.30$, $p < 0.001$). And the amount of preschoolers' ATL explained by parenting stress was 37.3%. Hence, hypothesis 1 was supported.

Second, the original model also fitted well by including authoritative parenting as a mediating variable, with various fit indices of RMSEA = 0.06, CFI = 0.95, TLI = 0.94, SRMR = 0.05. Parenting stress negatively significantly predicted authoritative parenting ($b = -0.52$, $p < 0.001$) with a 95% confidence interval of [−0.56, −0.48], and authoritative parenting significantly positively predicted preschoolers' ATL ($b = 0.10$, $p < 0.001$) with the 95% confidence interval was [0.08, 0.11], indicating that a mediating effect holds. The mediating effect size was 0.12, $p < 0.001$, with 95% confidence intervals of [0.10, 0.13], none of the 95% confidence intervals included 0, showing significance, and the mediating effect accounted for 54% of the total effect (0.22). As a result, authoritative parenting mediated the relationship between parenting stress and preschoolers' ATL. Hypothesis 2 was supported. Figure 2 shows the findings.

Testing of moderated mediation model

We used multi-group comparison to test whether household residency moderates the relationship between authoritative parenting and preschoolers' ATL. The result shows that in the tested model, both household residency (natives and migrants) pass the tests of measurement invariance, including Configural Invariance, Metric Invariance, and Scalar Invariance sequentially (Table 3 presents detailed analysis results). Therefore, the model can be applied to different groups. Further, we added pathways between the variables based on the tested model. In order to test whether there are

TABLE 2 Descriptive statistics and correlation matrix for each variable ($N = 5,047$).

	1	2	3	4	5	6
1. Gender	—					
2. Age	−0.01	—				
3. Approaches to learning	0.03**	0.03**	—			
4. Parenting stress	0.00	0.05**	−0.45**	—		
5. Authoritative parenting	0.01	−0.04**	0.35**	−0.37**	—	
6. Household residency	−0.02	0.16**	−0.09**	0.16**	−0.09**	—
M	—	2.04	2.29	2.62	3.63	—
SD	—	0.80	0.24	0.43	0.58	—

**$p < 0.01$.

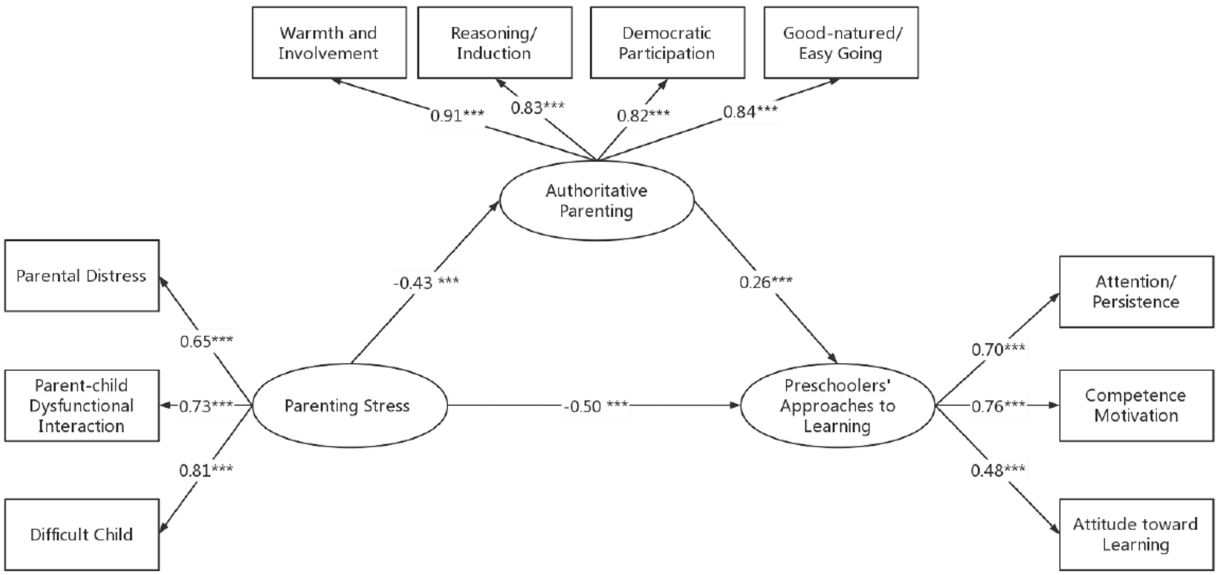

FIGURE 2
Mediation analysis results. *$p < 0.05$, **$p < 0.01$, ***$p < 0.001$. Gender and age were control variables, which are not shown in Figure, for concise purposes.

TABLE 3 Multi-group analyses of different household residency (native and migrant families) on the mediation model.

Model	χ^2	df	AIC	BIC	CFI	TLI	SRMR	RMSEA	ΔCFI	ΔTLI	ΔRMSEA	$\Delta\chi^2$ (Δdf)
Configural	985.35	64	43821.55	44252.30	0.96	0.95	0.04	0.07 [0.07, 0.08]	NA	NA	NA	NA
Metric	1011.24	71	43833.45	44218.51	0.96	0.95	0.05	0.07 [0.07, 0.08]	<0.01	<0.01	<0.01	25.89 (7)***
Scalar	1090.81	78	43899.02	44238.40	0.96	0.95	0.05	0.07 [0.07, 0.08]	<0.01	<0.01	<0.01	79.57 (7)***

***$p < 0.001$.

differences between the two groups in the latter half of the mediation model, the pathway between authoritative parenting and preschoolers' ATL was freely estimated between the two groups. Conversely, the pathway between parenting stress and authoritative parenting as well as the pathway between parenting stress and preschoolers' ATL were constrained between different groups. Then, the Wald Test is used to compare the difference between the two freely estimated paths. As a result of the Wald Test (Wald test = 23.45, $df = 1$, $p < 0.001$), the results indicated that native and migrant families showed significant differences on these two freely estimated paths.

In native families, the mediating effect value of authoritative parenting between parenting stress and preschoolers' ATL was −0.13, 95%CI was [−0.15, −0.11], and the mediating effect was significant, accounting for 21.2%. Among migrant families, the mediating effect was −0.08, 95%CI was [−0.09, −0.06], which was also significant, accounting for 12.8%. The difference in the mediating effect between the two types of families was 0.03, $p < 0.001$. Furthermore, the results show that the mediating effect of native families was significantly greater than that of migrant families. This indicates that household residency moderated authoritative parenting's mediating effects in the relationship between authoritative parenting and preschoolers' ATL. Thus, hypothesis 3 was supported.

Discussion

The relationship between parenting stress and preschoolers' approaches to learning

In this study, it was found that parenting stress negatively affected preschoolers' ATL. The family stress model also emphasizes the impact of family or parental stress on children's development (Masarik and Conger, 2017). According to the model, parental stress can contribute to a stressful home atmosphere, which can adversely affect the children (Schmiedeberg and Bozoyan, 2021). That is, when children are exposed to such a stressful family environment, they also experience more negative emotions such as feeling neglected, anxious, or depressed. Additionally, these negative feeling can hinder their concentration, flexibility, and creativity, discourage their passion for learning, and further impact their academic performance. Moreover, a parent who is stressed out by parenting tends to behave less affectionately and less patiently toward his or her children and becomes less engaged in their daily routine (Conger and Donnellan, 2007). It is conceivable that low-frequency and low-quality parent–child interactions have a negative impact on children's performance (Burchinal et al., 2002). Further, when parents experience high levels of parenting stress, children may not receive positive emotional support and responses from parent–child interactions but rather receive more negative feedback (Fonseca et al., 2020). Preschoolers often receive negative feedback or punishment, resulting in a lack of self-confidence, curiosity, exploration motivation, etc. Further, all these factors will inhibit preschoolers' ATL development. As such, reducing parental stress levels can improve not only the psychological well-being of parents but also the ATL of preschoolers as well (Deater-Deckard, 1998).

Mediating effect of authoritative parenting

The results showed that the authoritative parenting style mediated the relationship between parenting stress and preschoolers' ATL. In other words, authoritative parenting buffers the negative impact of parenting stress on preschoolers' ATL. As such, this pathway fits with the extension of the family stress model (Masarik and Conger, 2017; Lee et al., 2021). The family stress model indicates that parental stress and depression make it difficult for parents to maintain a positive relationship with their children and may lead to a variety of maladaptive parenting practices (Masarik and Conger, 2017). Consequently, children are at a higher risk of displaying problematic behaviors, achieving poor educational outcomes, and experiencing emotional difficulties (Schmiedeberg and Bozoyan, 2021). Firstly, consistent with previous studies, we have found that parenting stress negatively predicts authoritative parenting styles (Cheah et al., 2009). Parents may feel anxious and sullen under high levels of parenting stress, and these negative emotions may reduce their positive responses to their children (Fonseca et al., 2020). Moreover, parents who suffer from high parenting stress may experience self-doubt and low parenting self-efficacy, which leads them to be less involved in their children's daily lives (Crnic and Low, 2002). Nevertheless, all these behaviors are contrary to authoritative parenting. Secondly, the present study confirmed previous findings by indicating that authoritative parenting was positively related to preschoolers' ATL (Xia, 2023). Accordingly, authoritative parenting is more conducive to improving preschoolers' ATL because it displays high levels of warmth, support, and responsiveness. Indeed, parents who adopt authoritative parenting can understand their children's characteristics better and can help them maximize their strengths (Crnic and Low, 2002). Additionally, authoritative parents are better at communicating with their children, respecting and understanding their children's feelings, maintaining a positive parent–child relationship, and caring about their children's school lives. Consequently, children raised in this parenting style will be more independent, confident, and cooperative, as well as more proactive in their learning process, and will exhibit better ATL (Blair, 2002). Thus, parenting stress is not only directly related to preschoolers' ATL, but it is also indirectly related to preschoolers' ATL through authoritative parenting practices.

Moderating effect of household residency

The results of this study showed that household residency can moderate the relationship between authoritative parenting and preschoolers' ATL. Furthermore, compared with parents in migrant families, native parents' authoritative parenting showed a stronger positive relationship with preschoolers' ATL. In our opinion, several factors contributed to this finding. To begin with, economically, the data of the current study showed that migrant preschoolers' parents in China tend to work in manual labor jobs and have lower household incomes than native families. Moreover, it is well known that capital is vital resource parents provide to their children. Low family income will reduce parents' investment in their children's education, including extracurricular books, tutoring, and other education services (Gong and Zhong, 2015). It is imperative to note that this situation is very different from that of native children living in the cities (Gong and Zhong, 2015). Secondly, the result may be explained by the difference in educational background between migrant and native parents. According to the data, it has been found that migrant parents tend to be less educated than parents from native families. However, parents with higher educational levels have a better educational concept and authoritative parenting behavior, which is helpful for the development of children's ATL (Schady, 2011; Sung and Wickrama, 2018). Highly educated parents generally have effective approaches to supporting their children to learn and measuring their children's progress positively (Schmiedeberg and Bozoyan, 2021). Further, migrant parents generally work intensively for long hours, which leaves less time for them to be involved in their children's education (Gong and Zhong, 2015). Additionally, previous research has revealed that parents' mental health significantly impacts the performance of young children (Herba et al., 2016). Due to the household registration system in China, migrants have difficulty accessing the same urban resources as natives (Knight and Gunatilaka, 2010). Therefore, parents of migrant families may suffer from a sense of deprivation (Xiong et al., 2021). This negative feeling may reduce the effectiveness of their authoritative parenting and further influence children's ATL (Knight and Gunatilaka, 2010). Furthermore, Yan and colleagues indicated that parents' perceived social support positively influenced their children's ATL (Yan et al., 2022). However, migrant parents' perceived social support is generally lower than native parents, which in turn negatively impacts the child's ATL (Hashemi et al., 2021). Moreover, the family environment also plays an important role, since migrant families have low-quality housing and a chaotic home environment, which may negatively influence the development of preschoolers' ATL (Zhao et al., 2023). Thus, native families' authoritative parenting styles are more conducive to fostering preschoolers' ATL than migrant families.

Implication

According to the above, it can be concluded that preschoolers' ATL is closely associated with parenting stress, authoritative parenting, and household residency. Holly and colleagues suggested that parenting stress may be more influential on both parent and child development than other forms of stress (Holly et al., 2019). High levels of parenting stress can cause parents to become anxious, depressed, vulnerable, and ineffective at parenting, which may adversely affect the development of their children (Neece et al., 2012). Consequently, in order to improve preschoolers' ATL and help them reach their full potential, reducing parenting stress is crucial. It is possible for parents to alleviate parenting stress through a variety of techniques. These techniques include mindfulness meditation, exercise, reading books related to improving parenting practices, cognitive restructuring, and increasing communication with family members (Neece et al., 2012; Conner and White, 2014). Moreover, since social support is a valuable resource for relieving stress, the government and related institutions can provide parenting guidance or resources to parents (Crnic and Low, 2002). For example, the government can increase financial investment in childcare services and establish a sound childcare system. This will help working parents balance their work and parenting responsibilities. Further, preschools can organize parent support groups or create online communities where parents can connect, share experiences, seek advice and get emotional support from fellow parents. These groups create a sense of belonging and foster a supportive network among parents facing similar challenges.

In addition, authoritative parenting is generally considered to be the most effective parenting style, which is essential for potential early intervention (Crnic and Low, 2002). Children raised by authoritative parenting styles have fewer externalizing problems and better ATL (Pinquart, 2017). Parents can develop authoritative parenting style by receiving support from the government, preschools, or communities. To begin with, the government can establish policies supporting parental leave and appropriate working hours. These policies enable parents to work-life balance and spend quality time with their children, which is crucial for implementing authoritative parenting practices. Secondly, preschools can conduct a variety of parent education lectures where teachers can offer guidance and feedback on parenting approaches for parents. In addition, the community can provide parenting books, articles, and online resources for parents to educate themselves regarding authoritative parenting. Lastly, parents should be familiar with the characteristics of their children and provide them with the appropriate and necessary guidance to foster their development. Importantly, parents should be involved in their children's daily lives in a warm, supportive, and encouraging way.

Furthermore, this study also provides further evidence that household residency affects the relationship between authoritative parenting style and preschoolers' ATL. Burchinal et al. (2002) also point out that children's outcomes were most closely predicted by family characteristics. It has been shown that migrant families are at a disadvantage in accessing urban resources in China (Knight and Gunatilaka, 2010; Xiong et al., 2021). As the number of Chinese migrants continues to increase, we should pay attention to the needs of this special group (Zhao et al., 2023). For example, it may be necessary for the government to reform household registration or adopt more migrant-friendly policies to narrow the resource gap between migrant and native families (Hashemi et al., 2021). Specifically, for migrant preschoolers, the government should improve preschool enrollment policy for migrant children. This can protect migrant preschoolers' equal rights to preschool education in their urban residence and further foster their ATL development. Moreover, preschools can encourage regular parent-teacher communication to offer more assistance and guidance to migrant parents regarding their families' education. In addition, communities should assign more professional social workers or conduct various activities to help migrants integrate into the local community. This will be beneficial for ensuring the community integration, education acquisition, and

urban adaptation of parents and children from migrant families, thereby promoting the improvement of the ATL of migrant children.

Limitations and future research

Although examining the effects of parent and home variables, this study is limited by using parent reports to assess preschoolers' ATL. Even though our assessment is standardized, it may not be as sensitive to ATL as observational measures or individualized criteria assessments. In McDermott's view, teachers are the most effective and reliable source of observations of children's behavior in the classroom (McDermott, 1986; Dominguez et al., 2011). As such, teachers' observations of preschoolers' ATL based on preschool contexts would be valuable in future research.

Additionally, it is imperative to recognize that although our model assumed a relationship between parenting stress and preschoolers' ATL, we did not assess this relationship across multiple time periods. Previous studies have indicated that preschoolers' ATL develops dynamically. Therefore, further research is required to examine whether and how parenting stress influences longitudinal changes in preschoolers' ATL.

Conclusion

This study examined the effects of parenting stress on preschoolers' ATL based on the family stress model. The sample included preschoolers from migrant and native families in China. In addition, a mediating effect of authoritative parenting as well as a moderate effect of household residency was also investigated. Firstly, after controlling for gender and age, parenting stress affected preschoolers' ATL negatively. Secondly, authoritative parenting mediates the relationship between parenting stress and preschoolers' ATL. Last but not least, the mediating effects of authoritative parenting were moderated by household residency. Finally, this study contributes to previous research by examining the mechanisms of parenting stress on preschoolers' ATL. And we also inform efforts to improve ATL among preschoolers in Chinese migrant and native families.

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 for this study was provided by the Guangzhou University School of Education and related research ethics committee. All procedures followed were in accordance with the ethical standards of Institutional Review Board on Human Experimentation of School of Education, Guangzhou University [Guangzhou University, Guangdong Province, China] and with the Helsinki Declaration of 1975, as revised in 2000. Written informed consent to participate in this study was provided by the participants.

Author contributions

JZ and YF designed the study. JZ collected the data. YF and CL analyzed the data. ZL drafted and revised the main manuscript. JZ and LZ provided valuable ideas and substantial feedback for the study. All authors approved the final version of this manuscript.

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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.

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Profiles of parents' emotion socialization within a multinational sample of parents

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Introduction: Seminal emotion socialization theories classify parents according to two patterns of parent emotion socialization processes: 'emotion coaching' (i.e., parents validate and teach children about emotions) versus 'emotion dismissing' parenting (i.e., parents minimize and dismiss their children's emotions). However, empirical evidence supporting this binary distinction of parents remains limited. Our objective was to investigate whether parents can be differentiated by distinct patterns in their (1) beliefs about children's emotions, (2) emotion regulation, and (3) emotion-related parenting practices.

Method: Participants were parents of children aged 4–10 years from the Child and Parent Emotion Study (*N*=869) (https://bmjopen.bmj.com/content/10/10/e038124). Parents completed self-reported measures of emotion socialization processes via an online survey, which took 20–30 min to complete. Data included in the current study were collected May–August 2019. We conducted a latent profile analysis of parents' emotion socialization (13 indicators). To assess reliability of the profiles, we examined stability of the profiles across (1) parents of children in early versus middle childhood, and (2) fathers versus mothers, via measurement invariance testing. Further, to assess for construct validity of the profiles, we examined concurrent associations between six criterion constructs and parents' emotion socialization profiles.

Results: A three-profile model emerged characterizing parents by: (1) emotion coaching; (2) emotion dismissing; (3) emotion disengaged. There was strong support for construct validity and reliability.

Discussion: Our study provides empirical support for distinct differentiated classifications of emotion coaching and emotion dismissing parenting, aligned with emotion socialization theories. We further extend on extant theory and suggest a third 'emotion disengaged' classification, describing parents with moderate levels of emotion dismissing parenting and low levels of emotion coaching parenting. It should be noted that the profiles were derived with self-report data, therefore, data may have been biased by contextual factors. Furthermore, the study sample consisted of Western families from affluent backgrounds. The field should focus efforts on conducting person-centered studies with more diverse samples in future.

KEYWORDS

emotion socialization, child emotion development, meta-emotion theory, latent profile analysis, multiple-group latent profile analysis

1. Background

Emotion competence refers to the ability to manage emotions in an adaptive manner, a skill that is foundational in determining children's long-term socio-emotional functioning and mental health (Saarni, 1999; Kehoe and Havighurst, 2018). Parents' emotion socialization is a strong determinant of children's emotion competence (Morris et al., 2007; Zimmer-Gembeck et al., 2021). Several theoretical frameworks of emotion socialization posit that a number of elements underly parents' emotion socialization, such as parents' beliefs about emotions, parents' emotion regulation, and parents' emotion-related parenting practices (Gottman et al., 1996; Eisenberg et al., 1998; Morris et al., 2007). While the vast majority of emotion socialization research has utilized a variable-centered approach to examine how these elements are interrelated, there has recently been an emergence of person-centered studies. Person-centered analyses can identify subgroups of parents with similar patterns across several variables, and examine how these subgroups function across certain outcomes, as well as child outcomes (Kusurkar et al., 2021). There is a paucity of person-centered analyses that have examined multiple elements of emotion socialization, with large-scale multinational samples of mothers and fathers. Conducting a latent profile analysis of multiple elements of emotion socialization would enhance emotion socialization theory, as it would allow us to empirically validate Gottman et al.'s (1996) emotion coaching and emotion dismissing parenting constructs. The current study aims to (1) identify multivariate profiles of emotion socialization via a latent profile analysis, and (2) examine construct validity and reliability of the profiles.

Emotion socialization can be defined as the process of children learning culturally relevant beliefs and behaviors related to emotions and emotion expression via everyday social interactions within their environment (Bugental and Goodnow, 1998; Eisenberg et al., 1998; Morris et al., 2007; Friedlmeier et al., 2011). The field of emotion socialization typically posits that several elements of parent emotion socialization influence whether parents are considered emotion coaching or emotion dismissing parents, including: (1) beliefs about emotions, i.e., beliefs parents endorse that are related to emotions and emotion competence, such as the belief that emotions are helpful and important versus the belief that emotions are unhelpful and harmful; (2) parents' emotion regulation, i.e., the manner in which parents express and regulate their own emotions, often referred to as *implicit* parent emotion socialization; (3) parents' emotion-related parenting practices, i.e., parenting behaviors that teach children about emotions and scaffold children's emotion regulation skills (Gottman et al., 1996; Meyer et al., 2014; Ford and Gross, 2018; Hajal and Paley, 2020). The vast majority of emotion socialization research has utilized a variable-centered approach, i.e., examined continuous associations across dimensions of these elements.

Broadly, the field of emotion socialization posits that emotion socialization can be classified into *supportive parenting* (i.e., responses that support, guide and teach children how to regulate their emotions); and *unsupportive parenting* (i.e., parenting that invalidates children's emotions and does not help children regulate their emotions) (Eisenberg et al., 1998). Supportive/unsupportive parenting align with Gottman et al.'s (1996) conceptualizations of *emotion coaching* and *emotion dismissing* parenting. Emotion coaching parenting includes parents' beliefs that all emotions can be helpful and important; parents exhibiting adaptive emotion regulation skills; and parents' supportive and sensitive emotion-related parenting practices, whereby parents encourage and validate their children's emotions (Gottman et al., 1996; Halberstadt and Eaton, 2003; Katz et al., 2012). In contrast to emotion coaching, emotion dismissing parenting describes parents' beliefs that do not facilitate child emotion development (e.g., the belief that children use emotions to manipulate others); low levels of emotion regulation; and parents' unsupportive parenting practices, such as invalidation and minimization (Gottman et al., 1997; Katz et al., 2012). Gottman et al. (1996) and other emotion socialization researchers also contend that parents' emotion distraction is a dimension of emotion dismissing parenting. It is posited that parents' emotion distraction does not help guide children's emotion regulation or facilitate emotion awareness and understanding (Eisenberg, 1996; Magai and O'neal, 1997; Denham and Burton, 2003; Halberstadt et al., 2008; Bjørk et al., 2020). There is strong evidence that emotion coaching parenting is associated with positive child development, such as higher levels of emotion competence, academic success, and social competence (Gottman et al., 1996; Buckholdt et al., 2016; Johnson et al., 2017; Bjørk et al., 2020). Furthermore, strong empirical evidence supports that emotion dismissing parenting is associated with negative child development, such as increased levels of externalizing problems and peer problems, and lower levels of emotion competence (Berlin and Cassidy, 2003; Lunkenheimer et al., 2007; Frankel et al., 2012).

It is widely accepted within emotion socialization theory that associations between parents' beliefs about emotions, parents' emotion regulation, and parents' emotion-related parenting practices are reciprocal. However, there is a paucity of empirical work that has examined the manner in which these elements contribute jointly to parents' emotion socialization. Unclear measurement precision and conceptualization of the elements underlying parents' emotion socialization has been a common problem for variable-centered studies. Researchers often conceptualize emotion coaching and emotion dismissing parenting as continuous, unitary variables which combine several dimensions. This approach does not allow researchers to examine the complexity of the dimensions underlying emotion coaching and dismissing constructs. Further, this method cannot provide empirical support for the key proposition of emotion socialization theory, that there are two groupings of parents, since it cannot classify parents into subgroups. While variable-centered approaches examine unitary variables and overlook that some constructs do not exist in isolation (Law and Harrington, 2016), latent profile analysis is a person-centered approach which allows identification of subgroups of participants with similar patterns across several variables (Petersen et al., 2019; Kusurkar et al., 2021). Therefore, it is suitable for modeling complex, multidimensional constructs (Bámaca-Colbert and Gayles, 2010).

Cluster analysis, another type of person-centered analysis, albeit less common, assumes that observations with similar scores across the included variables are a member of the same cluster. On the contrary, latent profile analysis assumes that there are latent profiles which account for patterns of scores across observations (Weller et al., 2020). Two sets of parameters are typically estimated in a latent profile analysis: (1) posterior probabilities which reflect the distribution of profiles within the sample of participants; and (2) item-response means/variances which reflect the profile-specific item means/variances (Witherspoon et al., 2019). The modeling of item-response

mean scores allows researchers to examine the nuances of multiple continuous dimensions, i.e., compare the different mean levels of dimensions (e.g., intensity/frequency of beliefs, behaviors etc.) across profiles identified by the analysis. Finally, latent profile analysis can shed light on which patterns of emotion socialization are more or less prominent within a population of parents.

Within the past five years, there has been an increase in studies applying a person-centered approach to parent emotion socialization: (1) Wang et al. (2019): 731 Chinese fathers of children aged 10–18 years; (2) Sosa-Hernandez et al. (2020): 870 ethnoracially diverse US parents (mothers = 419; fathers = 451) of children aged 8–12 years; (3) McKee et al. (2021): 229 parents (mothers = 144, fathers = 85) of children aged 3–12 years from the US; (4) Buhler-Wassmann et al. (2021): 248 ethnoracially diverse US mothers with children aged 3–7 years; (5) Trevethan et al. (2021): 322 Indian and Chinese mothers of children aged 10 to 15 years; (6) Zhu and Dunsmore (2022): 204 Chinese two-parent dyads (mothers = 102, fathers = 102) of children aged 5–10 years; (7) Howe and Zimmer-Gembeck (2022): 322 Australian mothers of children aged 6–8 years. The majority of studies have conducted a latent profile analysis, with a small number of known studies utilizing a cluster analysis (Howe and Zimmer-Gembeck, 2022; Zhu and Dunsmore, 2022).

Almost all previous studies extracted at least an emotion coaching profile, and/or emotion dismissing profile, thus provide empirical support for supportive/emotion coaching and unsupportive/emotion dismissing subgroups of parents (Wang et al., 2019; Sosa-Hernandez et al., 2020; Buhler-Wassmann et al., 2021; McKee et al., 2021; Howe and Zimmer-Gembeck, 2022; Zhu and Dunsmore, 2022). Furthermore, all studies extracted at least two profiles that do not align with emotion coaching or emotion dismissing parenting, which suggests that a binary classification may be insufficient to capture the heterogeneous patterns of parents' emotion socialization (Wang et al., 2019; Sosa-Hernandez et al., 2020; Buhler-Wassmann et al., 2021; McKee et al., 2021; Trevethan et al., 2021; Zhu and Dunsmore, 2022).

The most common profile identified which did not align with either emotion coaching or emotion dismissing parenting described low-to-moderate levels of emotion coaching and emotion dismissing parenting. Researchers have given these profiles names such as 'disengaged', 'diffuse,' and 'low involved' (Sosa-Hernandez et al., 2020; Buhler-Wassmann et al., 2021; Howe and Zimmer-Gembeck, 2022; Zhu and Dunsmore, 2022). The additional classifications of parent emotion socialization identified beyond emotion coaching and emotion dismissing parenting suggests that levels of engagement in emotion socialization may also be a distinguishing factor between parents.

There are a number of limitations of previous person-centered emotion socialization studies that need to be considered. First, the majority of these studies focused solely on one element of parents' emotion socialization (i.e., emotion-related parenting practices) (Wang et al., 2019; Sosa-Hernandez et al., 2020; McKee et al., 2021; Trevethan et al., 2021; Zhu and Dunsmore, 2022). One known study has included an assessment of parents' beliefs about emotions, and parents' emotion expression, although, this study did not include fathers (Buhler-Wassmann et al., 2021). It should be noted that the aforementioned studies also included the distress reactions subscale from the Coping with Children's Negative Emotions Scale (Fabes et al., 2002), which several researchers argue is an appropriate proxy measure of parents' emotion regulation, since it assesses parents' emotion dysregulation in response to children's negative emotions (Yagmurlu and Altan, 2009; Hajal and Paley, 2020). However, there is evidence that this subscale has poor construct validity (King et al., 2022), thus, a measure/s of parents' emotion regulation that has stronger psychometric properties should also be included in future latent profile analyses of parents' emotion socialization.

An additional limitation of previous studies is that they have not tested whether the profiles identified significantly differ from one another. Examination of the 95% confidence intervals for the profile-specific item means provides evidence that the subgroups of parents significantly differ (Weller et al., 2020). If the 95% confidence intervals are not examined, it is possible that the final model was over-fitted (Weller et al., 2020; Sinha et al., 2021). In a latent profile analysis, each time there are parameters added to the model, i.e., an additional profile, goodness-of-fit indices improve; however, over-fitting of the model becomes more likely (Sinha et al., 2021). Profiles identified in over-fit models are less likely to be replicated in other samples and are less generalizable (Sinha et al., 2021). Examining the 95% confidence intervals can help provide support for profile delineation (Weller et al., 2020; Sinha et al., 2021).

Overall, fathers have been underrepresented in person-centered emotion socialization studies. Variable-centered research has suggested that mothers have higher levels of emotion coaching parenting, and lower levels of emotion dismissing parenting, compared to fathers (Cassano et al., 2007; Nelson et al., 2009; Wong et al., 2009). Further, McKee et al. (2021) latent profile analysis found that mothers were more likely to be assigned to the emotion coaching profile than the emotion dismissing profile, relative to fathers. It is possible that the underrepresentation of fathers in prior studies influenced the profiles that were extracted. Gottman (2001) proposed that fathers are more likely to respond to children's negative emotions with problem-solving. However, a combination of high levels of problem-solving and only low-moderate levels of emotion dismissing parenting would be considered a pattern of emotion dismissing parenting (Gottman, 2001).

Finally, no known person-centered study of emotion socialization has validated their profiles across different samples, in order to assess reliability of the profiles, via multi-group invariance testing. Multiple-group invariance testing can assess whether latent profiles are equivalent across different groups simultaneously, utilizing goodness-of-fit parameters (Morin et al., 2016; Spurk et al., 2020). Considering construct validity and reliability when conducting person-centered analyses is considered an important part of the process (Spurk et al., 2020). Testing construct validity and reliability of profiles extracted from a latent profile analysis establishes whether they can be generalized beyond the specific sample they were drawn from (Hicks et al. 2017; Petersen et al. 2019).

Findings from previous person-centered analyses provide empirical support to the conceptualization of emotion socialization in terms of distinct parenting profiles (Wang et al., 2019; Sosa-Hernandez et al., 2020; Buhler-Wassmann et al., 2021; McKee et al., 2021; Trevethan et al., 2021; Zhu and Dunsmore, 2022). However, the majority of studies have examined how only one element of emotion socialization contributes to parents' profiles of emotion socialization. Investigating several elements of emotion socialization, including, beliefs, emotion regulation, and parenting practices, would clarify how these elements occur together within different parent profiles, thus provide a more precise and holistic understanding of how parents

socialize their children's emotions. Previous studies have underrepresented fathers, and only one known study has included a multinational sample of parents (see Trevethan et al. (2021) latent profile analysis of Chinese and Indian parents). The current study aims to identify multivariate profiles of emotion socialization via a latent profile analysis of parents' self-reported beliefs about children's emotions, parents' emotion regulation, and parents' emotion-related parenting practices. *We predict that the latent profile analysis will extract one or more profiles that align with emotion coaching and emotion dismissing parenting.*

Our second aim is to examine construct validity and reliability of the profiles. To assess reliability of the profiles, we will examine stability of the profiles across (1) parents of children in early versus middle childhood, and (2) fathers versus mothers, via measurement invariance testing. Emotion socialization is thought to be dynamic in nature, changing according to child developmental periods (van der Pol et al., 2015; Mirabile et al., 2016; McKee et al., 2021). Further, strong research evidence suggests that gender influences parent emotion socialization (Cassano et al., 2007; Nelson et al., 2009; McKee et al., 2021). To test construct validity of the profiles, we will examine associations between the profiles and constructs that are theorized to influence parent emotion socialization, i.e., parent gender, familial/parent socio-economic status, parents' levels of stress, interparental conflict; and theoretically similar constructs, i.e., the family emotional climate, parenting warmth and irritability (Crnic et al., 2005; Morris et al., 2007; Park and Walton-Moss, 2012; Lee and Brophy-Herb, 2018; Sosa-Hernandez et al., 2020; McKee et al., 2021).

2. Methods

2.1. Participants and study design

The current study drew on data collected within an age-stratified longitudinal cohort study, the Child and Parent Emotion Study (CAPES) (Westrupp et al., 2020). In the current analysis, data consisted of Time 2 data collected for a pilot cohort of participants recruited in 2018 ($n = 124$), and Time 1 data for a second cohort of participants, recruited in 2019 ($n = 745$). Data were collected May–August 2019 via parent-reported online surveys, which took approximately 15–30 min to complete. CAPES was advertised online to prospective parents (i.e., pregnant), and parents of children aged 0–9 years; living in the following countries: Australia, New Zealand, the United Kingdom, Ireland, the United States, and Canada. Advertisements were posted via two main methods: (1) community organizations, such as libraries, paid and unpaid social media ads; and (2) Prolific, a UK-based participant recruitment platform. In the former method, parents were incentivized 20 x AU$50 gift vouchers as a prize for completing the survey. Parents recruited via Prolific were paid after completing the survey. The research team aimed to recruit a more diverse sample in 2019, by targeting advertisements toward fathers, ethnically diverse families, and families from a lower socio-economic status. They were successful in recruiting a higher number of fathers, migrant parents, and single parents. Data were not collected on parents' race/ethnicity as definitions of these social constructs vary across different countries. Although the study was advertised to parents of children aged up to 9 years, a small number of parents with children above this age completed the survey at Time 1. Further, a small number of parents residing outside of the countries listed under the inclusion criteria provided response data. A more detailed description of participant recruitment and data collection can be found in the Westrupp et al. (2020) protocol paper. The current study was preregistered. Data analysis code for the study is publicly available (see https://osf.io/xtk49/ for preregistration/data analysis code).

2.2. Measures

Demographic Characteristics. Demographic characteristics of parents, their partners, and their eldest child were collected via self-report.

Emotion-related parenting practices. Parent-reported emotion-related parenting practices were measured with six subscales from the short-form Coping with Children's Negative Emotions Scale (King et al., 2022): (1) punitive reactions, i.e., parents' punitive and controlling behaviors/threat of punishment (3 items, $\alpha = 0.78$); (2) minimization reactions, i.e., parents' minimization of emotions and derogative comments (3 items, $\alpha = 0.80$); (3) distress reactions, i.e., parents' emotion dysregulation and distress (3 items, $\alpha = 0.78$); (4) expressive encouragement, i.e., parents' encouragement of the experience and expression of emotions (3 items, $\alpha = 0.85$); (5) empathy, i.e., parental empathy of children's emotions (3 items, $\alpha = 0.81$); (6) problem-solving, i.e., parents' problem-solving to help manage the situation that led to children's negative emotions (3 items, $\alpha = 0.65$). In addition, we included three items with high factor loadings from the emotion-focused responses subscale of the Coping with Children's Negative Emotions Scale (described as 'emotion distraction' in the current paper) that were excluded from the short-form Coping with Children's Negative Emotions Scale: (7) emotion distraction, i.e., i.e., where parents may be warm/comforting, but distract children from their emotions (3 items, $\alpha = 0.65$). Subscales from the short-form Coping with Children's Negative Emotions Scale and the emotion distraction subscale were assessed on a 7-point Likert scale (1 = *very unlikely*, 4 = *medium*, 7 = *very unlikely*). Subscales were derived as standardized mean scores.

Parent emotion regulation. Parent-reported emotion regulation was measured with a modified version of The Difficulties in Emotion Regulation Scale 16-Item Short-Form (Bjureberg et al., 2016). Three items from the impulse subscale were added to strengthen this element of emotion dysregulation (19 items, $\alpha = 0.94$). Higher scores of the subscale reflect higher levels of emotion dysregulation. Items were assessed on a 5-point Likert scale (1 = *almost never*, 5 = *almost always*). The subscale was derived as a standardized mean score.

Parents' beliefs about children's emotions. Parent-reported beliefs about children's emotions were measured with five subscales from the Parents' Beliefs about Children's Emotions Questionnaire (Halberstadt et al., 2013): (1) 'control': the belief that children can control emotions by themselves (5 items, $\alpha = 0.78$); (2) 'autonomy': the belief children do not need help from others to manage their emotions (7 items, $\alpha = 0.86$); (3) 'stability': the belief that children's emotions are stable (4 items, $\alpha = 0.71$); (4) 'value of anger': the belief that children's experience and expression of anger is helpful (6 items, $\alpha = 0.77$); and 'manipulation': the belief that children use emotions to manipulate others (4 items, $\alpha = 0.84$). Items were assessed on a 6-point Likert scale

(1 = *strongly disagree*, 6 = *strongly agree*). The anger subscale was reverse coded to aid interpretation of the latent profile analysis. Subscales were derived as standardized mean scores.

Parents' stress. Parent-reported stress (7 items, $\alpha = 0.89$) was measured with the stress subscale of the Depression Anxiety Stress Scales-21 (Henry and Crawford, 2005). Items were assessed on a 4-point scale (0 = *did not apply to me at all*, 3 = *applied to me very much, or most of the time*). Subscales were derived as standardized mean scores.

Interparental conflict. Parent-reported interparental conflict was measured with two subscales from the Argumentative Relationship Scale, modified from the Co-parental Communication Scale (Australian Institute of Australian Studies, 2005): (1) verbal interparental conflict (4 items, $\alpha = 0.86$); (2) physical conflict (1 item). Items were assessed on a 5-point scale (1 = *never*, 5 = *always*). Subscales were derived as standardized mean scores.

Family emotional climate. Parent-reported family emotional climate was measured with two subscales from the short-form Self-Expressiveness in the Family Questionnaire (Halberstadt et al., 1995): (1) positive emotion expression (12 items, $\alpha = 0.90$); (2) negative emotion expression (12 items, $\alpha = 0.91$). Items were assessed on a 9-point scale (1 = *not at all frequently*, 9 = *very frequently*). Subscales were derived as standardized mean scores.

Parenting warmth and irritability. Parent-reported parenting behaviors were measured with two scales from the Longitudinal Study of Australian Children (Zubrick et al., 2014): (1) parenting warmth (6 items, $\alpha = 0.89$); (2) irritability (5 items, $\alpha = 0.87$). The parenting warmth items were assessed on a 5-point Likert scale (1 = *never/almost never*, 5 = *almost/almost always*), and the parenting irritability items were assessed on a 10-point Likert scale (1 = *not at all*, 10 = *all the time*). Subscales were derived as standardized mean scores.

2.3. Data analysis

2.3.1. Latent profile analysis

To address aim one, we conducted a latent profile analysis using Mplus (V 8.6) (Muthén and Muthén, 1998–2021) to identify multivariate profiles of parents' emotion socialization. We estimated models with 1–10 profiles. Thirteen indicators were included in the latent profile analysis: the standardized mean scores of five subscales for parents' beliefs about children's emotions, one total score of parent emotion dysregulation, and seven subscales of emotion-related parenting practices. A small number of participants ($n = 87$) did not provide response data for all three measures included in the latent profile analysis. We conducted Little's MCAR test via Stata to examine whether their response data were missing completely at random (MCAR). Results suggested that their data were not MCAR (χ^2 [65] = 104.03, $p < 0.01$, $N = 956$). We excluded their data, as they may have biased our results. Missing data, i.e., item-level missing data, were handled with Full Information Maximum Likelihood. A robust maximum likelihood estimator (i.e., MLR) was used in all models to account for clustering by household (i.e., where two parents from the same household participated in the study, $n = 111$). Our sample of $N = 869$ meets Nylund-Gibson and Choi (2018) recommendation of ≥300 observations for a latent profile analysis.

To determine the optimal number of profiles, a variety of fit statistics and methods were utilized. For instance, we examined changes in the Akaike, Bayesian, and sample-size adjusted Bayesian values. Accordingly, the model with the lowest values is selected as the best-fitting model, or, when adding a profile does not improve model fit. However, it is common for the Akaike, Bayesian, and sample-size adjusted Bayesian values to decrease with the addition of a profile. Due to this, it is common practice for researchers to also plot the Akaike, Bayesian, and sample-size adjusted Bayesian values on an elbow plot. The model which has the most prominent bend and/or is the point where the lines begin to plateau is considered to be the best fitting model, based on the elbow plot alone (Morin et al., 2016). In addition to the elbow plot, we examined the Vuong-Lo–Mendell–Rubin Likelihood Ratio Test/Lo–Mendell–Rubin Adjusted Likelihood Ratio Test. Values which are statistically significant ($p < 0.05$) indicate improvement of model fit in comparison to a model with one less profile (Morin et al., 2016). We examined the 95% confidence intervals of the within-profile means to assess profile delineation. In addition to fit statistics, deciding on the best-fitting model was guided by qualitative interpretation of the profiles, parsimony, and a sound theoretical rationale (Christensen et al., 2020).

2.3.2. Measurement invariance testing

To address aim two, i.e., reliability of the profiles, we assessed stability of the profiles across parents of children in early childhood versus parents of children in middle childhood, and mothers versus fathers. The current study followed steps 1–4 of Morin et al.'s (2016) multiple-group latent profile analysis steps, in order to test for measurement equivalence of the latent profile analysis for parents of children in early childhood versus parents of children in middle childhood, and mothers versus fathers. The first step establishes configural similarity, i.e., whether the same number of profiles can be extracted across each group. We conducted four latent profile analyses separately for (1) parents of children in early childhood; (2) parents of children in middle childhood; (3) mothers; (4) and fathers. Next, we conducted a multiple-group latent profiles analysis to use as a baseline comparison model. Using Mplus' 'knownclass' function (Muthen and Muthen, 2013), we estimated two baseline models in total, i.e., one for parents of children in early childhood and parents of children in middle childhood, and one for both mothers and fathers. Mean levels of indicators were freely estimated across groups, and variance was freely estimated across groups, but constrained within each group. The second step tests structural similarity, constraining indicator means to be equal across groups, and model fit is compared to the baseline configural model (i.e., two of Akaike, Bayesian, and sample-size adjusted Bayesian values must be lower than the baseline comparison model). The third step involves establishing dispersion similarity, i.e., the variance of profiles is the same across samples (i.e., two of Akaike, Bayesian, and sample-size adjusted Bayesian values lower than the structural similarity model). The variance of profiles is constrained to be equal across groups, in addition to constraining the indicator means to be equal across groups. The fourth step involves establishing distributional similarity, i.e., the sample size of the profiles is the same across groups (i.e., two of Akaike, Bayesian, and sample-size adjusted Bayesian values lower than the dispersion similarity model). The within-group profile probabilities are constrained to be equal across groups, in addition to constraining the variance of profiles and the within-profile means to be equal across groups.

2.3.3. Regression analysis

To address aim two, i.e., construct validity of the profiles, a multinomial logistic regression using Stata (V 15.1) (StataCorp, 2017) was conducted, to test the association between constructs that are theorized to influence parent emotion socialization (i.e., parent gender, socioeconomic status, parents' stress, interparental conflict), and theoretically related constructs (i.e., the family emotional climate, parenting warmth and irritability) with parents' emotion socialization profiles. We tested one model, whereby all variables were included. Missing data for the criterion constructs ranged from 2 to 15%. All analyses controlled for clustering of parents using a robust variance estimate, the vce cluster command (Williams, 2000).

3. Results

3.1. Demographic characteristics

Demographic characteristics of parents, their partners, and one of their children were collected via self-report (Table 1). The final sample consisted of $N = 869$ parents (mothers: $n = 745$, fathers: $n = 324$) of children aged 4–10.6 years ($M = 7.3$, $SD = 1.9$). Of this sample, 111 parent dyads participated (i.e., both parents in the household participated). On average, parents were 37 years old ($SD = 6.8$, range = 20–63 years). Almost half of parents were residents of Australia. Almost half were employed to work full-time hours. The majority of parents reported that they had a partner, and the majority reported that they were the biological parent of their child. Parents were largely from an affluent, middle-upper class background, with more than half of parents reporting a household income of >AU$52,000 and receiving a tertiary degree as their highest level of education. Household income was displayed in different currencies for participants residing outside of Australia (i.e., US$, NZ$, GPB).

3.2. Latent profile analysis

The three-profile solution was selected as the best-fitting model. Upon inspecting the Akaike (AIC), Bayesian (BIC) and sample-size adjusted Bayesian (ABIC) values plotted on an elbow plot, a bend was visible at the three-profile model, and reductions in the values were smaller for models with additional profiles (see Figure 1). Further, the VLMR and LMR values supported the three-profile model (see Table 2). We plotted and qualitatively examined the standardized mean scores and 95% confidence intervals of the three profiles (see Figure 2). The largest profile (57%, $n = 492$) aligned with 'emotion coaching' parenting, whereby parents on average reported low emotion dismissing beliefs (except for moderate levels of the stability belief), low emotion dysregulation, low emotion dismissing parenting practices, and high emotion coaching parenting practices. The smallest profile aligned with 'emotion dismissing' parenting (10%, $n = 86$), where parents reported high emotion dismissing beliefs, high emotion dysregulation, very high emotion dismissing parenting practices, and low emotion coaching parenting practices. We describe the third profile (33%, $n = 291$), as 'emotion disengaged parenting'. On average, parents in this group reported moderate levels of emotion dismissing beliefs, moderate emotion dysregulation, moderate emotion dismissing parenting practices, and low emotion coaching parenting practices. We examined the confidence intervals of the indicators included in the latent profile analysis to assess profile delineation and found that 9 of 13 indicators significantly differed for the emotion coaching versus emotion dismissing profile; 10 of 13 indicators significantly differed for the emotion coaching vs. emotion disengaged profile; and 7 of 10 indicators significantly differed for the emotion dismissing vs. emotion disengaged profile (see Figure 2 and Supplementary Table S2 of the Supplementary materials).

3.3. Measurement invariance testing

We plotted the standardized mean scores of the three-profile models for mothers, fathers, parents of children in early and middle childhood, to examine whether the profiles were similar for each subgroup. It appears that the emotion coaching, emotion disengaged, and emotion dismissing profiles are present for the three-profile solutions (see Supplementary Figures S1–S4). Further, while the AIC, BIC, and ABIC values continue to decline after the three-profile solution for all subgroups, the decline does not reduce after the three-profile model (see Figures 3, 4). The VLMR and LMR *value of p*s were < 0.05 for the three-profile model of fathers and parents of children in early childhood (see Table 2). For mothers and parents of children in middle childhood, *value of p*s were smallest for the six-profile solution. However, the six-profile solutions include profiles with very small numbers of participants. For mothers, there are profiles with solely 3% ($n = 17$) and 1% ($n = 6$) of the sample. For parents of children in middle childhood, there are profiles with solely 3% ($n = 15$) and 4% ($n = 17$) of the sample. While the additional subgroups identified within the six-profile models could be naturally occurring groups, it is difficult to test this. The profiles with <20 parents are likely too small for conducting further tests of construct validity and reliability. Further, some researchers argue that for models with profiles that include <5% of the sample, they may have been

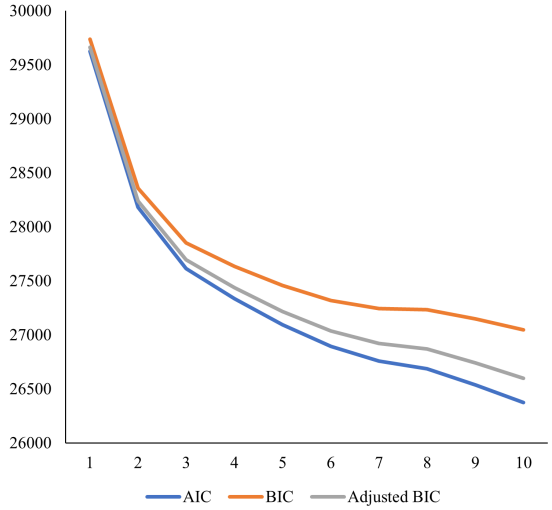

FIGURE 1
Elbow plot of information criteria for latent profile analysis (N = 869). AIC, Akaike; BIC, Bayesian; SABIC, Sample-Size Adjusted BIC.

TABLE 1 Demographic characteristics of sample.

Characteristic	*N* (%)
Parent sex	
Female	545 (63%)
Male	324 (37%)
Child sex	
Female	430 (49%)
Male	432 (50%)
Non-binary/trans-gender	1 (1%)
Total household income per year before tax ($AU)	
Up to $36,400	183 (21%)
$36,400–$52,000	214 (25%)
$52,000–$90,000	182 (21%)
$90,000–$140,000	100 (12%)
Above $140,000	174 (20%)
Parents' employment	
Full-time	241 (28%)
Part-time	366 (43%)
Long full-time (>45 h per week)	69 (8%)
Unemployed	180 (21%)
Parents' highest level of education	
Did not complete high school	14 (2%)
High school	139 (16%)
Trade certificate/diploma/ apprenticeship	192 (22%)
Bachelor degree (with or without honors)	291 (34%)
Postgraduate qualification	221 (26%)
Migration Status	
Parent born outside of country of residence	16%
Parent born in country of residence	84%
Country of residence	
Australia	378 (44%)
New Zealand	19 (2%)
United Kingdom	229 (26%)
Ireland	3 (<1%)
United States of America	198 (23%)
Canada	37 (4%)
Malta	1 (<1%)
Tanzania	1 (<1%)
Chile	1 (<1%)
Germany	1 (<1%)
Greece	1 (<1%)
Relationship status	
Partner	670 (89%)
No partner	85 (11%)
Parents' relationship with child	
Biological parent	672 (96%)
Adopted parent	5 (1%)
Stepparent	15 (2%)
Foster parent	1 (<1%)
Other type of legal guardian	5 (1%)

Data were missing for several parent and child demographics.

overfit (Weller et al., 2020). Conceptually, several of the profiles within the six-profile solutions do not make sense, as they do not align with emotion socialization theory or prior person-centered emotion socialization studies. We continued with the proceeding steps of measurement invariance testing, as we believe there is ample support the emotion coaching, emotion disengaged, and emotion dismissing profiles were identified within all three subgroups.

Two baseline configural models were tested, i.e., the three-profile model was estimated for mothers and fathers, and parents of children in early childhood and parents of children in middle childhood, in multiple-group latent profile analyses. Compared to the baseline configural model, the AIC, BIC, and SABIC values were smaller in the structural model compared to the configural model for parents of children in early childhood versus middle childhood (see Table 3). When comparing the configural model to the structural model for mothers versus fathers, it was found that the AIC value was higher for the structural model, but the BIC and SABIC values were lower for the structural model (see Table 3). Thus, based on fit statistics, there was support for structural similarity across the groups.

It was found that when comparing the dispersion model to the structural model for children in early versus middle childhood, the AIC value was higher for the dispersion model, but the BIC and SABIC values were lower for the dispersion model (see Table 3). Likewise, for mothers versus fathers, the AIC value was higher for the dispersion model, but the BIC and SABIC values were lower for the dispersion model (see Table 3). These findings provided support for dispersion similarity of the profiles.

We compared the fit statistics for the dispersion and distributional models, and found that for children in early versus middle childhood, the SABIC value was higher for the distributional model, but the AIC and BIC values were lower (see Table 3). Therefore, distributional similarity was supported for children in early versus middle childhood. Our findings provided strong support that the three profiles are equivalent for parents of children in early versus middle childhood, since there was support for configural, structural, dispersion, and distributional similarity. While there was support for configural, structural, and dispersion similarity for mothers versus fathers, we found that distributional similarity was not supported. The AIC, BIC, and SABIC values were all higher for the distributional model compared to the dispersion model, for mothers versus fathers (see Table 3).

According to Morin et al. (2016), if distributional similarity is not supported, there is evidence that one or more of the profiles are more prominent for one group over the other.

Compared to mothers, there was a higher proportion of fathers within the emotion dismissing and emotion disengaged profiles, and a lower proportion of fathers within the emotion coaching profile (emotion coaching profile: 67% mothers, 45% fathers; emotion

TABLE 2 Goodness-of-Fit statistics for latent profile analyses of parents' emotion socialization.

Model	*N* FP	LL	AIC	BIC	SABIC	Entropy	VLMR Value of *p*	LMR Value of *p*	*N* (%)
Complete sample									
One	26	−15964.280	31980.560	32104.511	32021.941	-	-	-	869
Two	40	−15189.357	30458.713	30649.407	30522.377	0.92	0.14	0.14	719 (83%) 150 (17%)
Three	54	−14849.385	29806.770	30064.207	29892.716	0.85	0.01	0.01	492 (57%) 291 (33%) 86 (10%)
Four	68	−14677.555	29491.109	29815.289	29599.337	0.88	0.37	0.37	200 (23%) 116 (13%) 497 (57%) 56 (6%)
Parents of children in early childhood									
One	26	−7781.596	15615.191	15720.607	15638.099	-	-	-	426 (100%)
Two	40	−7360.782	14801.564	14963.741	14836.807	0.88	0.24	0.25	309 (73%) 117 (27%)
Three	54	−7174.683	14457.367	14676.306	14504.944	0.87	0.03	0.03	43 (10%) 129 (30%) 254 (60%)
Four	68	−7086.197	14308.394	14584.096	14368.307	0.82	0.03	0.03	121 (28%) 42 (10%) 110 (26%) 153 (36%)
Parents of children in middle childhood									
One	26	−8160.131	16372.262	16478.695	16396.183	-	-	-	427 (100%)
Two	40	−7787.876	15655.752	15819.494	15692.552	0.94	0.24	0.24	374 (84%) 69 (16%)
Three	54	−7632.162	15372.324	15593.377	15422.005	0.84	0.12	0.12	159 (36%) 248 (56%) 36 (8%)
Four	68	−7523.144	15182.288	15460.651	15244.850	0.87	0.15	0.15	127 (29%) 65 (15%) 227 (51%) 24 (5%)
Mothers									
One	26	−9789.479	19630.957	19742.778	19660.244	-	-	-	545
Two	40	−9350.337	18780.674	18952.706	18825.730	0.96	0.12	0.13	58 (11%) 487 (89%)
Three	54	−9140.251	18388.502	18620.745	18449.328	0.86	0.12	0.12	159 (29%) 349 (64%) 37 (7%)
Four	68	−9035.404	18206.807	18499.261	18283.402	0.80	0.43	0.43	165 (30%) 140 (26%) 37 (7%) 203 (37%)
Fathers									
One	26	−5987.140	12026.281	12124.580	12042.111	-	-	-	324
Two	40	−5711.047	11502.095	11653.325	11526.449	0.84	0.34	0.36	309 (73%) 117 (27%)

(Continued)

TABLE 2 (Continued)

Model	*N* FP	LL	AIC	BIC	SABIC	Entropy	VLMR Value of *p*	LMR Value of *p*	*N* (%)
Three	54	−5589.444	11286.888	11491.048	11319.765	0.84	0.03	0.03	144 (44%) 137 (42%) 43 (13%)
Four	68	−5503.175	11142.350	11399.440	11183.751	0.88	0.29	0.29	4 (1%) 41 (13%) 146 (45%) 133 (41%)

N FP, number of free parameters; LL, loglikelihood; AIC, Akaike; BIC, Bayesian; SABIC, Sample-Size Adjusted BIC; VLMR, Vuon Lo–Mendell–Rubin Likelihood Ratio Test; LMR, Lo–Mendell–Rubin Adjusted Likelihood Ratio Test. See Supplementary Tables S1–S3 for results of the models with 1–10 profiles.

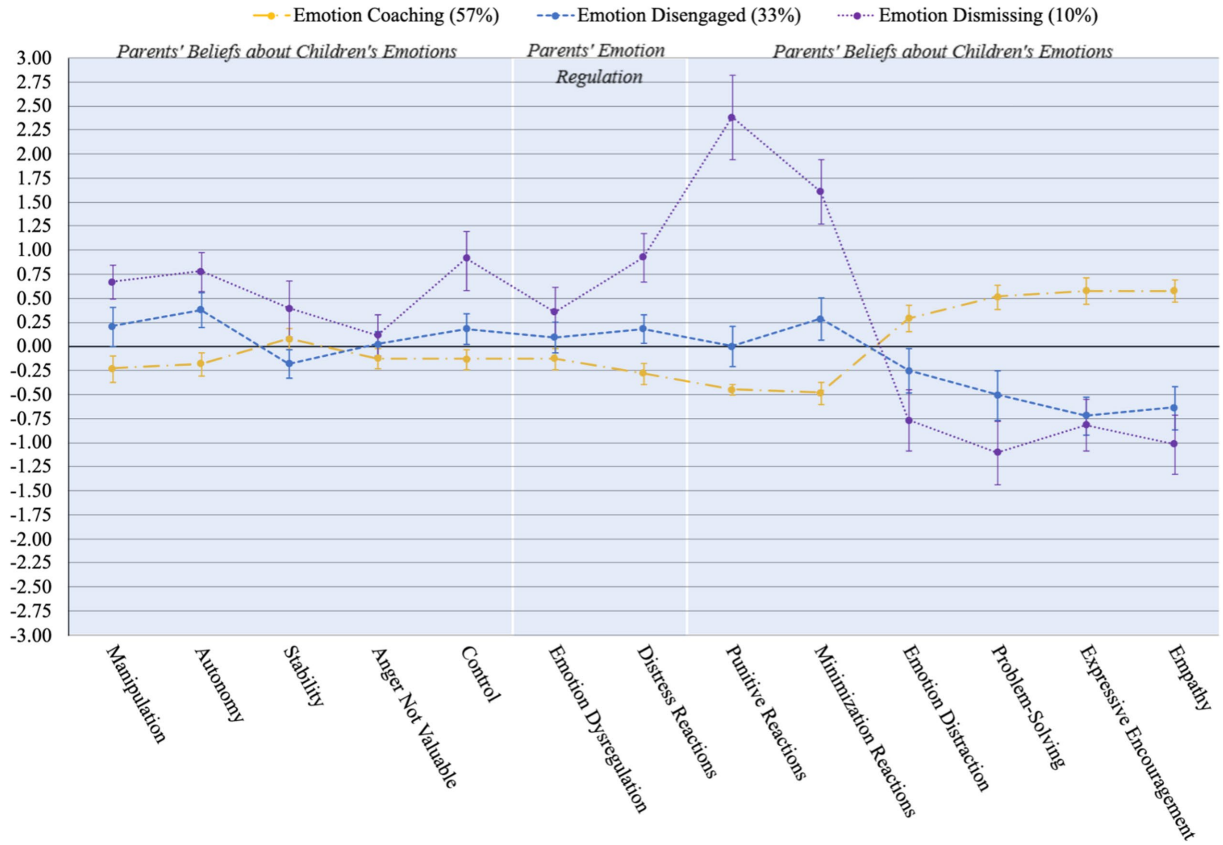

FIGURE 2
Standardized means scores of the three-profile model indicators and their 95% confidence intervals (*N* = 869).

disengaged profile: 26% mothers, 45% fathers; emotion dismissing profile: 7% mothers, 14% males). Morin et al. (2016) propose that if distributional similarity is not supported, a qualitative inspection is appropriate if there are strong theoretical grounds. We argue that although distributional similarity was not supported, altogether there was sufficient support for measurement invariance of the three-profile model for mothers and fathers.

3.4. Associations between familial characteristics and parent emotion socialization profiles

Parent profiles were represented as a categorical variable, i.e., 0 = *emotion coaching* (reference group); 1 = *emotion disengaged*, 2 = *emotion dismissing*. Mplus utilizes posterior probabilities to assign

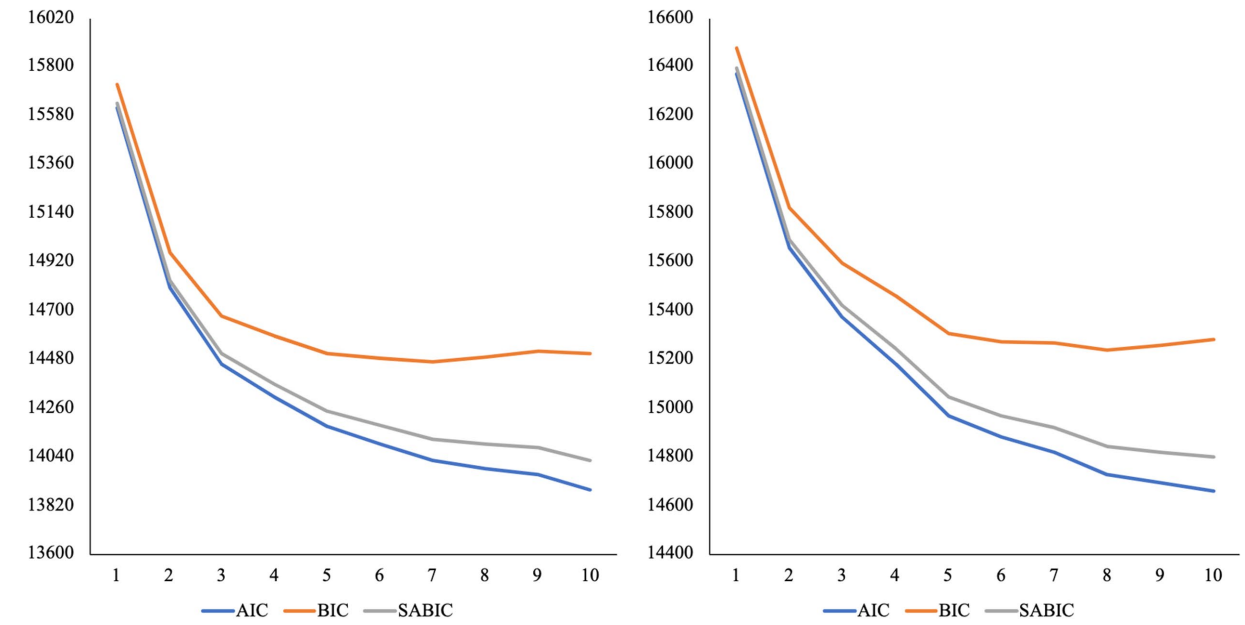

FIGURE 3
Elbow plots of information criteria for latent profile analysis of parents of children in early childhood (*N* = 426) and middle childhood (*N* = 427). AIC, Akaike; BIC, Bayesian; SABIC, Sample-Size Adjusted BIC.

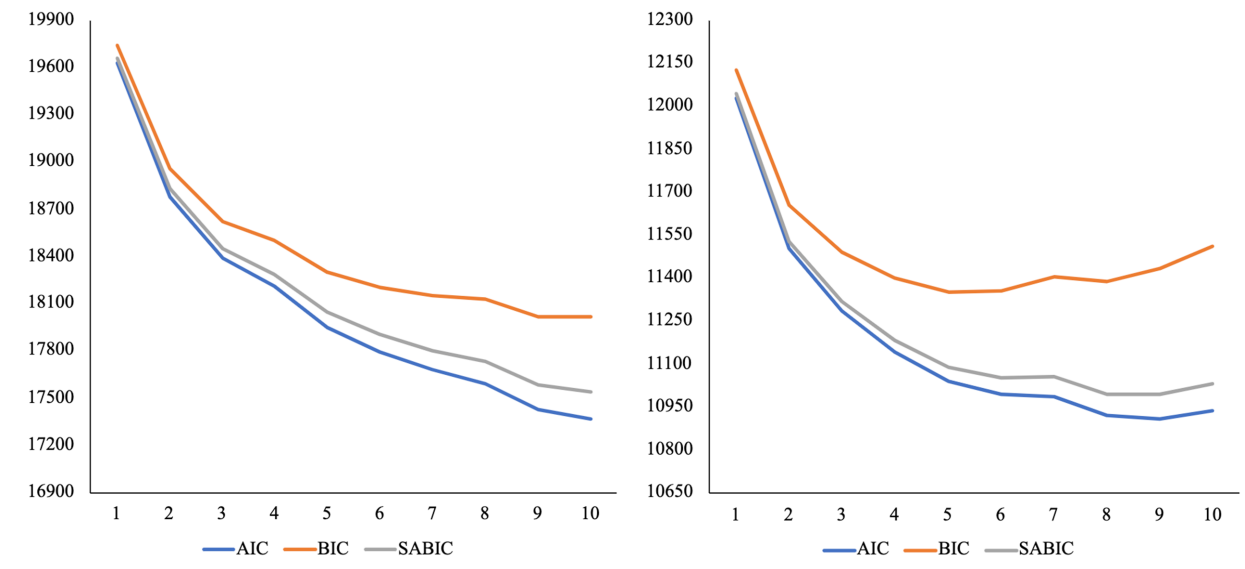

FIGURE 4
Elbow plot of information criteria for latent profile analysis of mothers (*N* = 545) and fathers (*N* = 324). AIC, Akaike; BIC, Bayesian; SABIC, Sample-Size Adjusted BIC.

participants into their most likely latent profile, represented by a categorical variable (Petersen et al., 2019); this variable was exported from Mplus into Stata. In a multinomial logistic regression, the profiles were regressed onto theoretically related constructs (see Tables 4, 5). We tested two models, one in which the emotion coaching profile was set as the base category, and another with the emotion disengaged profile as the base category, so that we could compare emotion coaching versus emotion dismissing, emotion coaching versus emotion disengaged, and emotion dismissing versus emotion disengaged.

Results provided support that fathers were more likely to be a member of the emotion dismissing profile compared to mothers, relative to the emotion coaching profile. We found evidence that negative emotions expressed within the family environment and parenting irritability were associated with the emotion dismissing profile, relative to the emotion coaching profile. Positive emotions

TABLE 3 Measurement invariance testing.

Model	k	*N* FP	LL	AIC	BIC	SABIC	Entropy
Parents of children in early childhood versus middle childhood							
Configural similarity	3	107	−15411.404	31036.807	31546.913	31207.107	-
Structural similarity	3	69	−15437.113	31012.225	31341.172	31122.045	0.85
Dispersion similarity	3	56	−15452.300	31016.600	31283.571	31105.729	0.85
Distributional similarity	3	55	−15451.038	31012.077	31274.281	31274.281	0.85
Mothers versus Fathers							
Configural similarity	3	107	−15305.095	30824.190	31334.296	30994.490	0.85
Structural similarity	3	69	−15369.349	30876.698	31205.645	30986.518	0.85
Dispersion similarity	3	56	−15388.980	30889.961	31156.932	30979.090	0.85
Distributional similarity	3	55	−15417.568	30944.568	31206.772	31032.106	0.85

k, number of profiles; N FP, number of free parameters; LL, loglikelihood; AIC, Akaike; BIC, Bayesian; SABIC, Sample-Size Adjusted BIC.

TABLE 4 Associations between criterion constructs and emotion socialization profiles: emotion coaching as base category.

Criterion construct	Emotion disengaged				Emotion dismissing			
	RR	*SE*	UL/LL 95% CI	*p*	*RR*	*SE*	UL/LL 95% CI	*p*
Parent gender	2.3	0.42	1.6, 3.3	**<0.001**	3.1	0.84	1.8, 5.3	**<0.001**
Socioeconomic status								
Parent education	1.1	0.23	0.77, 1.7	0.52	1.6	0.54	0.78, 3.1	0.20
Household income	0.79	0.16	0.53, 1.2	0.25	0.56	0.19	0.30, 1.9	0.08
Parents' stress	0.90	0.11	0.70, 1.1	0.36	0.77	0.13	0.56, 1.1	0.12
Interparental conflict								
Verbal interparental conflict	0.92	0.11	0.731, 1.2	0.44	0.84	0.14	0.60, 1.2	0.29
Physical interparental conflict	0.93	0.13	0.71, 1.2	0.56	1.1	0.15	0.85, 1.5	0.44
Family emotional climate								
Positive emotions expressed	0.54	0.08	0.41, 0.71	**<0.001**	0.50	0.09	0.35, 0.73	**<0.001**
Negative emotions expressed	1.3	0.16	1.0, 1.7	**0.03**	1.9	0.35	1.3, 2.7	**<0.001**
Parenting behaviors								
Parenting irritability	1.3	0.14	0.71, 1.2	**0.03**	1.7	0.29	1.2, 2.3	**<0.01**
Parenting warmth	0.65	0.08	0.51, 0.83	**<0.001**	0.51	0.08	0.38, 0.69	**<0.001**

RR, relative risk; SE, standard error; CI, upper limit and lower limit confidence intervals. The emotion coaching profile, being a cis mother, parents' higher education, (i.e., completion of an undergraduate or postgraduate university degree; education was recoded into a binary variable), and a medium/high income (household income was recoded into a binary variable) were used as the base outcomes for categorical variables. *p*-values of significant associations ($p<0.05$) are in bold.

expressed within the family environment and parenting warmth were negatively associated with the emotion dismissing profile, relative to the emotion coaching profile. There was no evidence of associations between membership of the emotion dismissing profile and socio-economic status, parents' stress, or interparental conflict, relative to emotion coaching. In the model with emotion disengaged set as the reference category, these associations were in the opposite direction.

Findings supported that, relative to the emotion coaching profile, parents in the emotion disengaged profile were more likely to be fathers than mothers. There was evidence that negative emotions expressed within the family environment and parenting irritability were associated with the emotion disengaged profile, relative to the emotion coaching profile. Our findings suggested that positive emotions expressed within the family environment and parenting

TABLE 5 Associations between criterion constructs and emotion socialization profiles: emotion disengaged as base category.

Criterion construct	Emotion coaching				Emotion dismissing			
	RR	*SE*	UL/LL 95% CI	*p*	*RR*	*SE*	UL/LL 95% CI	*p*
Parent gender	0.43	0.08	0.30, 0.62	**<0.001**	1.3	0.35	0.81, 2.3	0.25
Socioeconomic status								
Parent education	0.88	0.18	0.59, 1.2	0.52	1.4	0.47	0.70, 2.7	0.36
Household income	1.3	0.25	0.85, 1.9	0.25	0.71	0.22	0.39, 1.3	0.26
Parents' stress	1.1	0.14	0.88, 1.4	0.36	0.87	0.13	0.65, 1.2	0.32
Interparental conflict								
Verbal interparental conflict	1.1	0.12	0.87, 1.4	0.44	0.91	0.14	0.67, 1.2	0.54
Physical interparental conflict	1.2	0.15	0.83, 1.4	0.56	1.2	0.11	1.0, 1.4	**0.04**
Family emotional climate								
Positive emotions expressed	1.9	0.26	1.4, 2.4	**<0.001**	0.94	0.13	0.72, 1.2	0.64
Negative emotions expressed	0.77	0.10	0.60, 0.98	**0.03**	1.4	0.26	1.0, 2.0	**0.04**
Parenting behaviors								
Parenting irritability	0.79	0.09	0.64, 0.10	**0.03**	1.3	0.21	0.98, 1.8	0.07
Parenting warmth	1.5	0.19	1.2, 2.0	**<0.01**	0.79	0.10	0.62, 1.0	0.05

RR, relative risk; SE, standard error; CI, upper limit and lower limit confidence intervals. The emotion disengaged profile, being a cis mother, parents' higher education, (i.e., completion of an undergraduate or postgraduate university degree; education was recoded into a binary variable), and a medium/high income (household income was recoded into a binary variable) were used as the base outcomes for categorical variables. *p*-values of significant associations ($p<0.05$) are in bold.

warmth were negatively associated with the emotion disengaged profile, relative to the emotion coaching profile. There was no evidence of associations between membership of the emotion disengaged profile and socio-economic status, parents' stress, or interparental conflict, relative to emotion coaching.

Findings provided evidence that physical interparental conflict and negative emotion expression in the family were associated with the emotion dismissing profile, relative to the emotion disengaged profile. There was no evidence of associations between membership of the emotion dismissing profile and parent gender, socio-economic status, positive emotion expression in the family, parents' stress, verbal interparental conflict, parenting warmth, and parenting irritability, relative to emotion disengaged.

4. Discussion

The current study identified multivariate profiles of parents' emotion socialization. Our study presents empirical evidence challenging the proposition that patterns of emotion socialization converge around only two configurations, represented by emotion coaching and emotion dismissing parenting (Gottman et al., 1996; Eisenberg et al., 1998). In support of a broader classification framework, we identified a three-profile model: (1) emotion coaching; (2) emotion dismissing; and (3) emotion disengaged. We found evidence supporting the three-profile model in both mothers and fathers, parents of children in early childhood (i.e., child aged 4–6 years), and parents of children in middle childhood (i.e., child aged 7–11 years). Furthermore, our results support construct validity of the model given that the profiles were differentially associated with similar constructs and with constructs theorized to influence parent emotion socialization.

4.1. Emotion coaching profile

The profile with the highest number of parents was the emotion coaching subgroup (57%, $n=492$). The extraction of an emotion coaching profile supported our prediction that at least one of the profiles would align with this pattern of parenting. The emotion coaching profile describes a group of parents who endorse beliefs that are supportive of children's emotion competence; have strong emotion regulation skills; and exhibit supportive, emotion-validating parenting practices. Findings from variable and person-centered research have provided evidence that emotion coaching parenting scaffolds children's emotion development and teaches them how to effectively manage their emotions (Morris et al., 2007; Katz et al., 2012; Bjørk et al., 2020; McKee et al., 2021). Our study provides further empirical support for Gottman et al.'s (1996) meta-emotion theory construct, emotion coaching, and more broadly, supportive parenting (Gottman et al., 1996; Eisenberg et al., 1998). Our findings extend on previous person-centered studies that have also identified a pattern of emotion coaching parenting (Wang et al., 2019; Sosa-Hernandez et al., 2020; Buhler-Wassmann et al., 2021; McKee et al., 2021; Howe and Zimmer-Gembeck, 2022; Zhu and Dunsmore, 2022).

4.2. Emotion dismissing profile

The smallest profile (10%, $n=86$) described a subgroup of emotion dismissing parents. We predicted that the latent profile analysis would identify one profile aligned with emotion dismissing parenting, thus our findings supported this prediction. Parents within this profile endorse beliefs that do not facilitate child emotion competence; find it difficult to manage their emotions; and tend to invalidate and minimize their children's negative emotions.

Variable and person-centered research has found that emotion dismissing parenting does not teach children how to effectively manage their emotions, and may in fact lead to children experiencing increased distress (Denham et al., 2007; Johnson et al., 2017). Person-centered studies have found that children of parents within a similar profile have higher levels of internalizing problems, externalizing problems, and negative affect, relative to parents of children within an emotion coaching profile (Wang et al., 2019; McKee et al., 2021; Howe and Zimmer-Gembeck, 2022; Zhu and Dunsmore, 2022). Identification of the emotion dismissing profile provides further support for Gottman et al.'s (1996) emotion dismissing parenting construct, and broader emotion socialization theory's unsupportive parenting.

Our findings support previous studies that have also identified an emotion dismissing parenting profile (Wang et al., 2019; McKee et al., 2021; Howe and Zimmer-Gembeck, 2022; Zhu and Dunsmore, 2022). Likewise to the majority of previous studies, the profile with the smallest number of parents was the emotion dismissing profile (Wang et al., 2019; McKee et al., 2021; Zhu and Dunsmore, 2022).

4.3. Emotion disengaged profile

The identified third parent profile described 'emotion disengaged' parenting (33%, $n = 291$). While this profile extends on theoretical conceptualizations of emotion socialization, prior person-centered studies have extracted a similar profile (Sosa-Hernandez et al., 2020; Wang et al., 2020; Buhler-Wassmann et al., 2021; McKee et al., 2021; Trevethan et al., 2021; Zhu and Dunsmore, 2022). Parents in the emotion disengaged profile reported moderate levels of emotion dismissing beliefs, emotion dysregulation, and emotion dismissing practices, as well as low levels of emotion coaching practices. We emphasize that in naming this group 'emotion disengaged' parenting we refer to parents' passiveness toward children's emotions, and low levels of support and guidance for managing children's emotions, rather than more broadly referring to parental engagement with their child. Similar patterns have been described in the broader parenting literature (Kawabata et al., 2011; Briere et al., 2017; Shen et al., 2020; Lan, 2021). For instance, Baumrind (1991) proposed a 'disengaged' parenting style that describes parents low in warmth, sensitivity, and attentiveness. Our findings extend emotion socialization research by showing that a 'disengaged' parent group appears to be evident when simultaneously examining multiple constructs of emotion socialization, and appears to be evident consistently during early and middle childhood, and for mothers and fathers.

In contrast to the sizeable and established literature examining child outcomes of emotion coaching and dismissing parenting, there is less known about child outcomes for this parent profile. However, some person-centered studies have found that compared to children of parents with an emotion coaching profile of parenting, children of parents with an emotion disengaged profile had higher levels of internalizing problems externalizing problems, negative affect, and diurnal stress, lower levels of emotion regulation, and prosocial behavior (Wang et al., 2019; Sosa-Hernandez et al., 2020; Buhler-Wassmann et al., 2021; McKee et al., 2021; Zhu and Dunsmore, 2022).

4.4. Construct validity and reliability of the profiles

We found evidence supporting adequate reliability and construct validity of the profiles. First, we found that the profiles were equivalent in early and middle childhood, suggesting that parents' approach to emotion socialization is not dependent on child age. Second, in relation to parent gender, we found overall evidence supporting equivalence, but we did find that fathers were less likely to be a member of the emotion coaching profile; this is in line with findings from previous studies (Cassano et al., 2007; Nelson et al., 2009; Wong et al., 2009; McKee et al., 2021). It is of note that we included parental empathy in our latent profile analysis, a dimension not included in prior person-centered analyses. Parental empathy of children's emotions is considered a key aspect of emotion coaching and child emotional development (Stern et al., 2015; Meng et al., 2020). Fathers may have been disproportionally represented in the emotion coaching profile as a result of measurement bias. Research has suggested that self-report measures of empathy are influenced by gender expectations and biases, thus do not adequately capture empathy of fathers (Baez et al., 2017; Macdonald et al., 2022).

We found evidence that fathers were more likely to be assigned to the emotion dismissing and disengaged profiles than the emotion coaching profile. These findings have extended on our understanding of emotion socialization and parent gender (i.e., cis-gender parents). Research has suggested that mothers have higher levels of emotion coaching parenting, and lower levels of emotion dismissing parenting, compared to fathers (Cassano et al., 2007; Nelson et al., 2009; Wong et al., 2009). One known latent profile analysis found that mothers were more likely to be assigned to an emotion coaching profile than an emotion dismissing profile, relative to fathers (McKee et al., 2021). Overall, fathers have been underrepresented in previous variable-centered research.

The profiles were associated with several criterion constructs within expected directions. Compared to parents in the emotion coaching profile, parents within the emotion dismissing and disengaged profiles reported higher levels of negative emotions expressed within the family environment and parenting irritability. Furthermore, parents within the emotion dismissing and disengaged profiles reported lower levels of positive emotions expressed within the family environment and parenting warmth. These findings provide support for validity of the emotion socialization profiles (Sharp and Fonagy, 2008; Bariola et al., 2011; Warmuth et al., 2020; Davis-Kean et al., 2021; Chung et al., 2022). We note that effect sizes of the aforementioned associations for the disengaged profile were attenuated compared to those for the emotion dismissing profile. For instance, emotion dismissing parents reported higher levels of negative emotions expressed within the family environment compared to the disengaged parents. In a regression model with emotion disengaged set as the reference category, we found evidence that parents within the emotion dismissing profile had higher levels of physical interparental conflict and negative emotion expression within the family environment, although these were weak associations. These findings provide support for profile delineation of the emotion dismissing and disengaged profiles.

Although the emotion dismissing and disengaged parenting profiles share some elements, there is evidence that they are distinct patterns of parenting. Previous person-centered studies found that

children of emotion dismissing parents had lower levels of emotion regulation and prosocial behavior compared to children of emotion disengaged parents (Wang et al., 2019; Zhu and Dunsmore, 2022). It is of note that we found emotion dismissing parents were higher in punitive responses to children's emotions, compared to disengaged parents. Frequently responding to children's emotions with harsh, punitive responses teaches children that emotions are uncomfortable and increases children's distress (Gottman et al., 1997; Denham et al., 2007; Thompson and Meyer, 2007). While disengaged parenting may not provide children ample guidance and support to manage their emotions, disengaged parents' lack of harsh, punitive responses to children's emotions may buffer their children from the more severe negative outcomes. It is worth considering that the absence of parenting practices which are optimal for children's emotion competence, versus the presence of parenting practices found to have a negative impact on children's emotion competence, likely has distinct developmental impacts on children's emotion competence (Little et al., 2019).

We note that 'emotion distraction' (i.e., parents offer comfort to children in a way that distracts the child from their negative emotions) was high for parents within the emotion coaching profile. Although relatively high on average, this subscale was rated lower by parents compared to the other emotion coaching parenting practices (e.g., parental empathy). This suggests that parents within this profile respond to their children's emotions with emotion distraction/comforting behaviors at times, but are more likely to respond with the other dimensions of emotion coaching we assessed.

It is of note that not all indicators included in the latent profile analysis differentiated parents as expected. Firstly, parents within the emotion coaching profile had higher levels of the belief that children's emotions are stable over time, than the disengaged profile, and no difference was found for the stability belief between the emotion dismissing and emotion coaching profiles, which was unexpected. Perhaps parents' stability belief is related to the intensity of parents' belief about the value or danger of children's emotions, albeit in different directions for the subpopulations in the emotion coaching and emotion dismissing profiles. Halberstadt et al. (2013) theorize that parents' beliefs that emotions remain stable over time is linked to less supportive emotion-related parenting practices, due to pessimism about effecting change in children's emotions. Our findings might suggest the contrary. Perhaps, for parents in the emotion coaching profile, believing their children's emotions are stable motivates emotion coaching behaviors so they can help their child experience well-regulated emotions and establish long-lasting emotional skills. For parents in the disengaged profile, believing their children's emotions are changeable may motivate a *laissez-faire* attitude such that they engage in emotion-related parenting practices simply to manage behavior in the moment, thereby limiting their engagement in supportive emotion-related parenting practices relative to emotion coaching parents and in unsupportive emotion-related parenting practices relative to emotion dismissing parents. However, these ideas regarding the attributions that may connect parents' emotion-related beliefs and parenting practices need to be tested through additional empirical research.

It is of note that parents' emotion regulation for the emotion disengaged profile was not significantly differentiated from the other two profiles, based on the 95% confidence intervals. Hajal and Paley (2020) argue that for emotion socialization research, measures which assess 'parent-specific' emotion regulation should be prioritized. While Hajal and Paley (2020) posit that the distress reactions subscale of the Coping with Children's Negative Emotions Scale (Yagmurlu and Altan, 2009; Hajal and Paley, 2020) is a viable assessment of parents' emotion regulation, there is evidence of poor construct validity for this subscale (King et al., 2022). Nevertheless, we found that the short-form distress reactions subscale differentiated parents' emotion regulation as expected, which has a more parsimonious set of items compared to the original subscale (King et al., 2022).

Finally, it is important to note that in the majority of previous emotion socialization person-centered studies, the emotion coaching profile has accounted for roughly a third of the sample (Wang et al., 2019; Sosa-Hernandez et al., 2020; McKee et al., 2021; Howe and Zimmer-Gembeck, 2022; Zhu and Dunsmore, 2022). More than half of our sample was assigned to emotion coaching (57%), which suggests our sample was overrepresented by emotion coaching parents. Furthermore, on average, 15% of previous studies' samples were assigned to the emotion dismissing profile (Wang et al., 2019; McKee et al., 2021; Zhu and Dunsmore, 2022). In comparison, 10% of our sample was assigned to this profile. The measures used to assess parents' beliefs and emotion-related parenting practices may have led to an overrepresentation of emotion coaching parents. These measures align with emotion socialization theory's binary classification of emotion socialization, thus are not designed to capture other patterns of parents' emotion socialization. Furthermore, it is possible that the lack of diversity within our sample explains this discrepancy. Families in the current study were largely from an affluent, middle-upper class background, and while parents did not provide response data on their race/ethnicity, it is likely that they were from an Anglo-Celtic/European background, due to the intersection of race/ethnicity and socio-economic status.

While a dearth of research has examined the interplay of emotion socialization and socio-economic status, evidence suggests that higher levels of social disadvantage is associated with emotion dismissing parenting (Shaffer et al., 2012; McKee et al., 2021). For instance, McKee et al.'s (2021) latent profile analysis found that compared to low-income families, high income families were less likely to be a member of an emotion dismissing profile. Parents with limited resources and support likely experience increased stressors and difficulties managing their emotions, therefore, emotion dismissing parenting (Shaffer et al., 2012; Burke and Dittman, 2022). Furthermore, parents who have a higher education may be more likely to receive opportunities and resources that educate them on more optimal parenting approaches.

The cultural background of parents is salient in determining their children's emotion competence (Curtis et al., 2020). To-date, emotion socialization research has largely focused on samples from a Western background. Therefore, the social norms surrounding emotions and emotion competence within these samples needs to be considered. For example, within Western countries, children's emotion expression is often supported, in-general, but in several cultures emotion expression is less valued (Yang et al., 2020; Ip et al., 2021). For instance, in several Asian countries, especially those with a more collectivist culture, in which social harmony is emphasized, children's emotion expression is often viewed as disruptive and unhelpful, thus less accepted by parents (Yang et al., 2020; Ip et al., 2021).

While a number of previous person-centered emotion socialization studies have included samples from ethnically diverse

and non-Western backgrounds (Wang et al., 2019; Sosa-Hernandez et al., 2020; Trevethan et al., 2021), as well as families experiencing high levels of social disadvantage (McKee et al., 2021), the majority of studies have included parents from one, but not both, of these marginalized groups. Families from intersecting marginalized groups face cumulative pressures and stressors, which likely influences familial functioning (Morris et al., 2007; White et al., 2012; Sarno et al., 2021). Examining these families is important for understanding how they can be better supported, and subsequently improve child emotional outcomes. Only two known person-centered studies to-date have included samples which represent ethnically diverse/non-Western families, as well as families experiencing social disadvantage (Buhler-Wassmann et al., 2021; Zhu and Dunsmore, 2022). Interestingly, while Buhler-Wassmann et al.'s (2021) study included a diverse sample with high levels of social disadvantage, a large proportion of parents (44%) were still assigned to an emotion coaching profile. Although, this sample only included mothers. On the contrary, in Zhu and Dunsmore (2022) study, roughly a third of the sample were assigned to an emotion coaching profile, which included fathers. How contextual factors influence parents' profiles of emotion socialization, especially race/ethnicity and socio-economic status, remains understudied, and warrants future attention.

4.5. Strengths

There are several strengths of the current study. Firstly, we conducted the first known latent profile analysis of parents' beliefs about children's emotions, parents' emotion regulation, and parents' emotion-related parenting practices. A large number of indicators that reflected these elements of emotion socialization were included; we were able to examine how these dimensions of emotion socialization are reflected in a large-scale, multinational sample of parents, in a holistic and concise manner. The emotion socialization profiles were equivalent for parents of children in early childhood, middle childhood, mothers, and fathers, thus are generalizable to these groups of parents.

4.6. Limitations

It should be noted that there are several limitations of the current study. First, all measures were self-reported by parents, thus responses may have been biased. Research has provided evidence that how social desirability bias influences families' self-report data is nuanced. For instance, evidence suggests that providing objective parent-report assessments of parenting is more difficult for parents compared to parent-report assessments of child outcomes (Bennetts et al., 2016). Furthermore, self-report data do not provide a direct assessment of parents' emotion socialization. Person-centered studies which utilize a range of data collection methods, such as survey data as well as observational data, would provide more accurate assessment of parents' emotion socialization profiles. Our sample underrepresented LGBTQI+ families, First Nations families, and families with high levels of social disadvantage; more than half of parents in the current study had received a tertiary education, and income was positively skewed. Since parenting is contextually driven, person-centered emotion socialization research that is representative of marginalized groups and families experiencing social disadvantage is needed to gain a better understanding of emotion socialization within these families. Marginalized groups experience unique parenting challenges compared to the majority group/s, e.g., identity issues, discrimination, and cumulative stressors. Although our sample was multinational, parents were from Western, English-speaking countries, and as such, share some commonality of cultural values that could relate to emotions. Parents were not asked to provide self-report data related to their race/ethnicity, which would have provided more insight into diversity of our sample. However, it is likely that families were predominantly from a European/Anglo-Celtic background. While latent profile analysis is a robust procedure based on fit statistics, selection of the final model is also informed by researcher's qualitative interpretation (Petersen et al., 2019). Thus, replication of profiles can be limited by researcher decisions. Additionally, sample characteristics can limit replication (Van De Schoot et al., 2017; Petersen et al., 2019). Nevertheless, the profiles extracted in our latent profile analysis corresponded largely with similar analyses, further supporting the validity and generalizability of these groupings of parents.

4.7. Conclusion

The current study identified three profiles of parent emotion socialization that reflect theoretically meaningful constructs, via a latent profile analysis. We have extended emotion socialization theory by providing rigurous empirical support for Gottman et al.'s (1996) meta-emotion theory parenting constructs, i.e., emotion coaching and emotion dismissing. Our findings provide evidence for a third classification of parenting, 'emotion disengaged'. This profile describes parents' passiveness toward children's emotions, and low levels of support and guidance for managing children's emotions. Drawing attention to disengaged parenting could be helpful for clinicians and researchers. Current emotion-focused parenting interventions aim to reduce emotion dismissing parenting and increase emotion coaching parenting (Havighurst et al., 2020). Clinicians and parenting interventions may be able to tailor their services for parents with an emotion disengaged pattern of emotion socialization, thus potentially improve treatment efficacy and retention rates of parents, and subsequent child development outcomes. Future research should aim to replicate the emotion socialization profiles with diverse samples, and assess child outcomes of the profiles.

The increasing popularity of utilizing a person-centred approach to assess parents' emotion socialization is a positive development in the field. However, researchers need to consider several factors when applying this analytic approach, such as theory; the dimensions included; the measures used; the sample of parents included in the study; transparency of the key decisions and steps made when conducing the latent profile analysis and selecting the final model; delineation of the profiles; validation and reliability of the profiles.

Data availability statement

The datasets presented in this study can be found in online repositories. The names of the repository/repositories and accession number (s) can be found below: doi: 10.26193/82RCP6.

Ethics statement

The studies involving human participants were reviewed and approved by Deakin University Human Research Ethics Committee (DUHREC). The patients/participants provided their written informed consent to participate in this study.

Author contributions

EW, JM, and GK: conception of the project. EW, CK, SH, and JD: conception of the theoretical frameworks underpinning the project. GK, EW, GY, and TB: data collection. GK, EW, JM, and CG: data analysis. EW and JM: supervision. GK, EW, CK, SH, JD, JM, and CG: drafting of the manuscript. All authors contributed to the article and approved the submitted version.

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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.

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Supplementary material

The Supplementary material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/fpsyg.2023.1161418/full#supplementary-material

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Parental warmth, adolescent emotion regulation, and adolescents' mental health during the COVID-19 pandemic

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Introduction: The United States (U.S.) Surgeon General Advisory has characterized the COVID-19 pandemic as a youth mental health crisis. Thus, elucidating factors affecting adolescents' mental health during the pandemic is important for supporting youth through current and future challenges. Parenting influences adolescents' ability to cope with stressors, and emotion regulation strategy use may underlie these effects.

Methods: This longitudinal study of 206 adolescents (49% female; 46.6% Latine) from the U.S. evaluated pathways from perceived parental warmth and affection at age 12 to changes in adolescents' internalizing and externalizing problems from before the pandemic (age 14) to the initial phase of the U.S COVID-19 pandemic in Spring 2020 (age 15) through adolescents' pre-pandemic cognitive reappraisal and expressive suppression emotion regulation strategy use at age 14.

Results: Parental warmth and affection predicted decreased internalizing, but not externalizing, problems during the initial phase of the pandemic, and this effect was explained by adolescents' reduced reliance on expressive suppression as an emotion regulation strategy.

Conclusion: These findings illuminate parenting and emotion regulation strategy selection as modifiable processes to support adolescents' mental health in this crisis and beyond.

KEYWORDS

adolescence, COVID-19, emotion regulation, longitudinal, mental health, multiple mediation

Introduction

The COVID-19 pandemic negatively affected the physical, economic, and psychological well-being of individuals across the world. In addition to global grieving over lost lives, efforts to prevent the spread of COVID-19 (e.g., isolation, remote learning; Park et al., 2020) negatively impacted mental health (Hertz-Palmor et al., 2021), particularly for adolescents (Samji et al., 2022). Longitudinal studies have documented significant increases in adolescents' internalizing symptoms (e.g., anxiety, depression; Ravens-Sieberer et al., 2022) and externalizing symptoms

(e.g., attention problems, rule-breaking; Rosen et al., 2021) over pre-pandemic levels. Informed by these patterns, the United States (U.S.) Surgeon General issued an advisory underscoring the youth mental health crisis precipitated by the COVID-19 pandemic on December 6th, 2021, and encouraged research to understand changes in adolescents' mental health and identify key opportunities for support (U.S. Surgeon General's Advisory, 2021).

Despite trends toward increased mental health difficulties among adolescents during the COVID-19 pandemic, marked individual differences remained. Research to identify mechanisms driving these individual differences will inform efforts to support adolescents' navigation of future challenges. Thus, this investigation drew on an ongoing longitudinal study to evaluate prospective relations between warmth and affection in the parent–child relationship at age 12 and adolescents' mental health during the first phase of the U.S. COVID-19 pandemic 3 years later (i.e., spring 2020; age 15) beyond adolescents' pre-pandemic problems at age 14. A mediation analysis evaluated the extent to which hypothesized positive effects of parental warmth and affection on adolescents' mental health during the pandemic would be explained by adolescents' pre-pandemic emotion regulation strategy use at age 14.

Parenting and adolescent mental health

A host of parenting qualities and practices (e.g., hostility, demandingness, supportiveness, responsiveness) influence youth's internalizing and externalizing behavior problems (Pinquart, 2017a, b). Parental warmth and affection, which is linked to parental responsiveness (Khaleque and Rhoner, 2002), is a particularly important aspect of parenting for understanding adaptive adjustment across adolescence (Alcaide et al., 2023), demonstrating positive relations with adolescent adjustment across diverse cultural groups (Khaleque, 2013), and as relevant to adolescents' capacities for socioemotional resilience in contexts of adversity (Masten et al., 2004). For example, in a study of adolescents' anxiety pre- and post-hurricane Katrina, Costa et al. (2009) found that adolescents who reported their parents engaged in low communication, acceptance, and high control prior to Katrina showed elevated rates of anxiety in response to the hurricane as compared to their peers who reported their parents provided more communication, warmth, and sensitivity.

Parenting effects may be magnified in stressful contexts, especially during the COVID-19 pandemic when lockdown restrictions limited developmentally normative peer connections (Hartup, 1989) and heightened the salience and frequency of parent-adolescent contact. During the COVID-19 pandemic, cross-sectional data showed that positive parenting (e.g., emotion socialization, supportive responses to pandemic-related reactions) has the potential to mitigate negative relations between COVID-19 stressors and adolescents' adjustment (Cohodes et al., 2021). However, both longitudinal studies that include pre-pandemic controls and process-oriented studies that evaluate potential mediating mechanisms underlying these effects remain rare. The current study filled these gaps by evaluating prospective relations from early adolescents' reports of parental warmth and affection at age 12 to adolescents' COVID-19 mental health symptomatology 3 years later during the spring of 2020 (i.e., age 15) as related to adolescents' pre-pandemic emotion regulation strategy use at age 14.

Parenting and adolescent emotion regulation

Emotion regulation involves monitoring, appraising, and modifying one's emotional reactions to upregulate, downregulate, or maintain emotional states to achieve a desired regulatory goal (Gross, 2015). Effective deployment of emotion regulation strategies requires adequate emotional knowledge (Denham et al., 2015) and confidence in one's ability to manage emotions, both of which develop in the context of parent–child relational exchanges (Brumariu, 2015). Thus, emotion regulation is a central mechanism by which parenting may influence youth adjustment. Further, as with parenting effects in contexts of adversity, emotion regulation takes on heightened adaptive significance in risky contexts.

Among the many strategies used to regulate emotions (McRae and Gross, 2020), antecedent-focused *cognitive reappraisal* (CR; i.e., altering one's thoughts about an emotionally evocative stimulus to change its emotional impact; John and Gross, 2004) is more often associated with positive adjustment outcomes (Aldao et al., 2010) than response-focused *expressive suppression* (ES; i.e., inhibiting emotionally expressive behaviors; Gross, 1998), which is commonly associated with negative adjustment outcomes (Dryman and Heimberg, 2018). Among adolescents, CR is related to greater life satisfaction, perceived social support, and positive affect (Verzeletti et al., 2016), as well as fewer internalizing problems (Garnefski et al., 2005) and better emotional recovery after a social stressor (Shapero et al., 2019). In contrast, adolescents' ES is related to strained social interactions (Butler et al., 2003), PTSD symptoms (Zhou et al., 2017), and internalizing problems (Balan et al., 2017).

A sizable body of evidence indicates that parenting behaviors influence the degree to which youth engage specific emotion regulation strategies. For example, in a sample of young children, Gunzenhauser et al. (2014) found that parents' support of their child's emotional experiences coupled with their own use of CR predicted their child's use of CR. In contrast, parents who were unsupportive (i.e., minimizing or punitive reactions) of their child's emotional experiences and who used ES to manage their own emotions had children who were more likely to use ES. Extending to early adolescence, Jaffe et al. (2010) found that warm and affectionate parenting as reported by youth in early adolescence (9–12 years old) predicted adolescents' greater concurrent use of CR, whereas less warmth and affection was associated with greater use of ES. Informed by these prior studies, we hypothesized that parental warmth and affection in early adolescence would be related to adolescents' later use of more CR and less ES emotion regulation strategies.

Parenting, emotion regulation, and adolescent mental health

Emotion regulation skills are a salient mechanism undergirding parenting effects on adolescents' socioemotional adaptation (Sheppes and Gross, 2011). These effects may be especially pronounced in adolescence because it is a uniquely vulnerable time for socio-emotional development (Rapee et al., 2019), as well as in the context of the COVID-19 pandemic because it was a stressor for children and families. Indeed, adaptive strategies, such as CR, typically decrease

across early adolescence with less adaptive strategies, such as ES, taking hold during mid-adolescence (Gullone et al., 2010; Zimmermann and Iwanski, 2014). Coincident with increasing reliance on potentially problematic emotion regulation strategies, adolescents also develop heightened levels of internalizing (McLaughlin et al., 2011) and externalizing (Compas et al., 2017) problems, particularly in stressful contexts (Larson et al., 2002), such as the COVID-19 pandemic (Park et al., 2020).

A handful of studies have tested mediating relations from elements of parenting associated with warmth and affection to adolescent mental health problems via CR and/or ES emotion regulation strategies. For example, Ogbaselase et al. (2020) found that adolescents who reported family exchanges characterized by high levels of negative emotion, low levels of positive emotion, and low parental warmth endorsed lower reliance on CR and greater use of ES which, in turn, predicted elevated depressive symptoms. Likewise, negative parenting practices, such as inconsistent discipline, corporal punishment, and poor monitoring, are linked to adolescents' higher internalizing difficulties through their greater use of ES (Balan et al., 2017). Regarding positive parenting quality, parent's supportive responses to adolescents' negative emotions are linked to better wellbeing through emotion regulation strategies, such as ES and CR (Ding et al., 2022). Walton and Flouri (2010) found that adolescents who reported higher parental warmth and affection endorsed fewer emotion regulation difficulties and, by extension, fewer conduct problems than those who reported lower parental warmth and affection. Similarly, adolescents who reported high autonomy support from their mother in early adolescence engaged in less ES, and, ultimately, experienced fewer depressive symptoms, as compared to adolescents who reported lower levels of maternal autonomy support and higher rates of ES strategy use (Brenning et al., 2015). Therefore, we hypothesized that parental warmth and affection during early adolescence would be related to adolescents' increased use of positive emotion regulation strategies, such as CR, and decreased use of problematic strategies, such as ES, in ways that would protect and promote adolescents' mental health during the COVID-19 pandemic.

The current study

Recent data suggest that close and secure caregiver-child relationships promote better-than-expected mental health responses to the COVID-19 pandemic (Coulombe and Yates, 2021). Likewise, some research has shown that adolescents' pre-pandemic emotion regulation difficulties predicted more mental health problems during the pandemic (Breaux et al., 2021). Extending these investigations, the current study offered a novel test of theoretically specified mediating relations from parental warmth and affection at age 12 to fewer internalizing and externalizing problems during the initial phase of the U.S. COVID-19 pandemic at age 15 via adolescents' pre-pandemic emotion regulation strategy use at age 14. Importantly, this investigation examined both internalizing *and* externalizing problems simultaneously with both CR *and* ES emotion regulation strategies, whereas prior studies have typically focused on either ES *or* CR (Balan et al., 2017) as related to either internalizing *or* externalizing symptoms (e.g., Walton and Flouri, 2010; Weissman et al., 2021). We hypothesized that parental warmth and affection at age 12 would be associated with adolescents' later use of more frequent CR and less frequent ES emotion regulation strategies at age 14. In turn, we predicted that pre-pandemic reports of more CR and less ES would be related to fewer internalizing and externalizing problems in the context of the COVID-19 pandemic 1 year later over and above pre-pandemic symptomatology.

In addition to controlling for prior levels of internalizing and externalizing problems, this three-wave longitudinal investigation considered adolescents' sex assigned at birth, ethnicity-race, family income-to-needs, and contemporaneous exposure to stressful life events during the pandemic as potentially salient influences on the hypothesized relations. Extant literature points to significant sex differences in mental health problems as related to parenting (Lansford et al., 2014), emotion regulation (Nolen-Hoeksema, 2012), and the COVID-19 pandemic (Magson et al., 2021). Moreover, given documented disparities in COVID-19 experiences (i.e., morbidity and mortality rates) across ethnic, racial, and economic groups (Karmakar et al., 2021), as well as in parenting influences on adolescent adjustment (Williams and Merten, 2014), we included these sociodemographic characteristics as covariates. Due to the negative influences of stressors related to COVID-19 on the parent–child relationship and adolescents' mental health during the pandemic (Achterberg et al., 2021), we also controlled for adolescents' contemporaneous reports of COVID-19 stressors (e.g., missed or canceled events, parental job loss, death or serious illness of a family member).

Method

Participants

The current sample was drawn from an ongoing study following 250 caregiver-child dyads every 1–2 years from preschool through late adolescence. The current analyses included the 206 dyads that completed one or more assessments at ages 12, 14, and/or 15. Participating caregivers at age 12 were biological mothers (92%), biological fathers (3%), adoptive mothers (2.5%), and other female extended kin (2.5%). Adolescents completed assessments at age 12 (N = 201; M_{age_W1} = 12.25; SD = 0.35), 1 year prior to the onset of COVID-19 pandemic at age 14 (N = 160; M_{age_W2} = 14.19; SD = 0.28), and/or during the first 2 months of the U.S. national emergency declaration in the spring of 2020 at age 15 (N = 157; M_{age_W3} = 15.22; SD = 0.57). The sample was diverse with respect to sex (49% female sex assigned at birth, 51% male sex assigned at birth), ethnicity and race (46.6% Latine, 24.3% multiethnic/racial, 18.4% Black, 10.2% white, 0.5% Asian), and income (23.5% qualified for government assistance). Data for adolescents who completed one or more study waves were included in these analyses. Of the 206 participating adolescents, 173 (83.9%) participated in two or more data waves.

Procedures

Flyers inviting participation in a longitudinal study of children's learning and development were distributed to community-based childcare centers in Southern California. Families were screened to ensure the child was between the ages of 3.9 and 4.6 months, proficient in English, and not diagnosed with a developmental disability at the time of the first assessment. Several years later, these same children

completed a variety of measures, which were administered in-person at age 12, via telephone at age 14, and using an on-line survey at age 15 during the initial months of the COVID-19 pandemic when stay-at-home orders were in effect. Informed consent was obtained from the legal guardian and informed assent was collected from the participating adolescent at each wave. Adolescents were compensated $10–25 per assessment hour across waves. All procedures were approved by the human research review board of the participating university.

Measures

Parental warmth and affection

At age 12, adolescents completed the short form of the Parental Acceptance and Rejection Questionnaire (PARQ-SF; Rohner et al., 1978). Adolescents reported their perception of their caregiver's warmth and affection across 8 items (e.g., My caregiver makes it easy for me to tell them things that are important to me) on a scale from 1 (*almost never true*) to 4 (*almost always true*). The average item score was used for these analyses. The PARQ-SF has been shown to be a reliable measure across diverse ethnic and cultural groups (Khaleque and Rohner, 2002), including in the current study (alpha = 0.74).

Emotion regulation

At age 14, adolescents completed the 10-item Emotion Regulation Questionnaire for children and adolescents (ERQ-CA; Gross and John, 1998). Adolescents responded to six items assessing their tendency to use CR (e.g., When I want to feel happier, I think about something different) and four items assessing their tendency to use ES (e.g., When I am feeling happy, I am careful not to show it) on a scale from 1 (*not at all true for me*) to 3 (*really true for me*). The average item score was used for these analyses. This measure has shown good internal consistency across a 12-month period (Gullone and Taffe, 2012), and reliabilities for both the CR (alpha = 0.78) and ES (alpha = 0.66) scales were acceptable in this sample.

Behavior problems

At ages 14 (1 year prior to the U.S. national emergency declaration) and 15 (in spring of 2020), adolescents completed the Youth Self Report (YSR; Achenbach and Edelbrock, 1991). The YSR is a 112-item questionnaire asking adolescents to respond to statements about their behaviors on a 3-point-likert scale ranging from 0 (*not true*) to 2 (*very true/often true*). At age 14, adolescents reported their problem behaviors within the prior 6 months. However, to capture problems in response to the initial COVID-19 crisis, adolescents were asked to report on their behavior problems within the previous 2 weeks at the spring 2020 COVID-19 assessment. The internalizing and externalizing broadband *t*-scores from the YSR were used in these analyses. The internalizing scale incorporated 31 items tapping anxiety, depression, and somatic complaints (e.g., I worry a lot; alphas = 0.90 and 0.91 at ages 14 and 15, respectively). The externalizing scale included 32 items about rule-breaking, hyperactivity, and aggressive behaviors (e.g., I have a hot temper; alphas = 0.90 at both ages 14 and 15).

Family income-to-needs

At age 12, family financial resources were determined based on the caregiver's reported household income. Caregivers described all financial contributions to the household during the preceding 12-month period (e.g., salary, child support). This figure was divided by the appropriate poverty threshold for a one- or two-parent household and the number of dependent children in the home (U.S. Census Bureau, 2016) to yield the continuous income-to-needs ratio that was used in all analyses.

Stressors related to COVID-19

At age 15, an adapted version of the Adolescent Life Events scale (ALEQ; Hankin and Abramson, 2002) assessed adolescents' exposure to stressors related to COVID-19 during the initial phase of the pandemic. Adolescents reported either 0 (*no*) or 1 (*yes*) regarding whether they had experienced 22 negative events during the preceding 2 weeks, which were adapted to capture specific stressors related to COVID-19 (e.g., Has your caregiver tested positive for coronavirus/COVID-19?). Stress related to COVID-19 was indicated by the total number of stressful life events endorsed by adolescents.

Data analytic plan

Descriptive and bivariate analyses were conducted using IBM SPSS Statistics (Version 27). A multivariate analysis of variance (MANOVA) evaluated group differences across study variables as a function of adolescents' sex assigned at birth, ethnicity-race, and their interaction. The hypothesized parallel mediation model was evaluated using the Lavaan package (Rosseel, 2012) in RStudio 4.1.0 (RStudio Team, 2021). All analyses controlled for adolescents' sex, ethnicity and race, family income-to-needs, stressors related to COVID-19, and pre-pandemic symptomatology. A sensitivity analysis evaluated this same model using only the 122 participants who provided complete data at all three waves of the study.

Inspection of missing data patterns revealed that 5 (2.4%) adolescents were missing data on parental warmth and affection because they did not complete the age 12 assessment, and an additional 12 (5.8%) adolescents did not complete the PARQ due to time constraints. Five families (2.4%) were missing income-to-needs data because they did not complete the age 12 assessment and an additional 5 (2.4%) were missing due to insufficient information provided. At age 14, 46 (22.3%) adolescents did not have data on the ERQ or YSR because they did not complete the age 14 assessment. At age 15, 49 (23.8%) adolescents were missing data on internalizing and externalizing problems because they did not complete the COVID-19 assessment, and one (0.5%) additional adolescent did not complete the YSR during the assessment. Little's (1988) MCAR test indicated data were missing at random, $\chi^2(169) = 192.96$, $p = 0.100$, supporting the use of full information maximum likelihood (FIML) to handle missing data (Schafer and Graham, 2002).

Results

Descriptive and bivariate analyses

Table 1 depicts descriptive and bivariate relations among study variables. Paired-samples *t*-tests utilizing listwise deletion revealed significant increases in adolescents' internalizing and externalizing problems from pre-pandemic ($M_{internalizing}$ = 45.91; *SD* = 10.46;

TABLE 1 Descriptive statistics and bivariate correlations of study variables.

	1	2	3	4	5	6	7	8	9
1. Family income-to-needs ratio (age 12)	–								
2. Parental warmth/affection (age 12)	0.077	–							
3. Cognitive reappraisal (age 14)	0.055	0.195*	–						
4. Expressive suppression (age 14)	0.062	−0.177*	0.159*	–					
5. Pre-COVID-19 internalizing problems (age 14)	−0.049	−0.144	−0.044	0.167*	–				
6. Pre-COVID-19 externalizing problems (age 14)	0.057	−0.046	0.046	0.253**	0.660**	–			
7. COVID-19 internalizing problems (age 15)	0.019	−0.016	−0.055	0.315**	0.098	0.087	–		
8. COVID-19 externalizing problems (age 15)	0.025	−0.096	−0.018	0.251**	0.060	0.074	0.676**	–	
9. COVID-19 related stressors (age 15)	0.204*	0.011	0.076	−0.001	0.053	0.007	0.336**	0.198*	–
M	2.35	3.67	2.18	1.82	45.93	44.31	51.26	48.58	2.51
SD	1.5	0.4	0.5	0.5	10.5	10.7	11.8	10.5	2.8

Note: *$p < 0.05$ level. **$p < 0.001$.

$M_{externalizing}$ = 44.31; SD = 10.70) to COVID-19 ($M_{internalizing}$ = 51.26; SD = 11.85; $M_{externalizing}$ = 48.58; SD = 10.52) reports ($t_{internalizing}$ [133] = −3.78, $p < 0.001$; $t_{externalizing}$ [133] = −2.76, $p = 0.007$). A MANOVA tested whether there were differences by sex (i.e., females, males), ethnicity-race (i.e., white, Black, Latine, multi-ethnic/racial/other), or their interaction across all nine study variables (i.e., family income-to-needs, parental warmth, ES and CR internalizing and externalizing symptoms at ages 14 and 15, and stressors related to COVID-19). Based on the 122 participants with complete data at all waves, the MANOVA revealed no significant main effects by adolescents' sex [$F(9, 106) = 1.73$, $p = 0.091$; Wilks' $\lambda = 0.872$], ethnicity-race [$F(27, 310) = 0.72$, $p = 0.849$; Wilks' $\lambda = 0.838$], nor their interaction [$F(27, 310) = 1.31$, $p = 0.144$; Wilks' $\lambda = 0.730$].

Bivariate analyses showed parental warmth and affection at age 12 was positively related to CR and negatively related to ES emotion regulation strategy use at age 14, though CR and ES emotion regulation strategies were positively correlated with another. Adolescents' internalizing and externalizing problems were positively and concurrently related at both ages 14 and 15. ES was positively related to internalizing and externalizing problems at both ages 14 and 15. Family income-to-needs at age 12 and behavior problems at age 15 were positively related to stressors related to COVID-19.

Mediation analysis

A parallel mediation model tested relations between parental warmth and affection at age 12 and changes in adolescents' internalizing and externalizing problems from age 14 (pre-pandemic) to age 15 (COVID-19) as mediated by CR and ES emotion regulation strategy use at age 14 while controlling for sex assigned at birth (female =1, male = 0), ethnicity and race (Latinx = 1, non-Latinx = 0), and family income-to-needs (see Figure 1). Table 2 depicts unstandardized and standardized bootstrapped estimates of the mediation results. The mediation model accounted for 23.5% of the variance in adolescents' internalizing problems (Cohen's $f^2 = 0.307$) and 10.8% of the variance in their externalizing problems (Cohen's $f^2 = 0.121$). Despite the absence of a significant direct effect from early adolescents' reports of parental warmth and affection to adolescents' internalizing and externalizing responses to the COVID-19 pandemic, indirect paths through CR and ES were tested as per current recommendations (Hayes, 2009). Results revealed a significant indirect effect from parental warmth and affection in early adolescence to fewer internalizing problems in response to the COVID-19 pandemic 3 years later (i.e., beyond pre-pandemic internalizing problems) via adolescents' lower reliance on ES as an emotion regulation strategy at age 14. This indirect pathway accounted for 21.5% of the variance in adolescents' internalizing problems during the COVID-19 pandemic. Neither the indirect effect through CR to internalizing problems, nor indirect pathways to externalizing problems through CR or ES attained significance.

Sensitivity analysis

A sensitivity analysis evaluated the proposed model among the 122 cases with complete data at all waves (i.e., list-wise deletion). This analysis replicated the primary study finding of a significant indirect effect from parental warmth and affection at age 12 to a reduction in adolescents' internalizing problems during the COVID-19 pandemic through lower reliance on ES at age 14 ($B = -1.99$, $SE = 0.10$, $p = 0.045$) but not through CR ($B = -0.98$, $SE = 0.17$, $p = 0.17$). All other pathways were consistent with the full sample analyses, with two exceptions. First, the pathway from parental warmth and affection to cognitive reappraisal was marginal in this subsample ($p = 0.066$), but significant in the full sample ($p = 0.038$). Second, the pathway from cognitive reappraisal to internalizing symptoms was significant in this subsample ($p = 0.034$), but marginal in the full sample ($p = 0.058$).

Discussion

This investigation advances our understanding of parenting influences on adolescents' mental health during the COVID-19 pandemic. We evaluated whether and how parental warmth and affection at age 12 predicted changes in adolescents' internalizing and externalizing problems across the transition to the U.S. COVID-19 pandemic lockdown. As predicted, adolescents who reported higher levels of warm and affectionate parenting at age 12 also endorsed greater use of CR and less use of ES emotion regulation strategies at

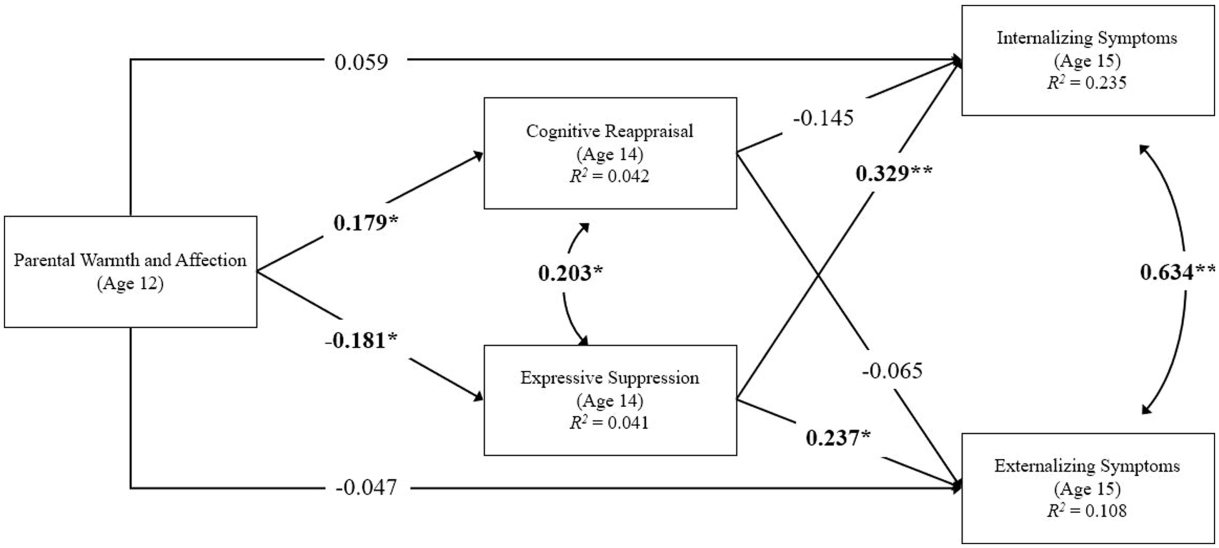

FIGURE 1
A parallel mediation model with cognitive reappraisal and expressive suppression (age 14) as mediators of warm and affectionate parenting (age 12) on internalizing and externalizing symptoms (age 15). Pathways depict standardized coefficients with significant relations indicated in bold with asterisks. Covariates (not shown) include child sex, race and ethnicity, income-to-needs, prior internalizing and externalizing symptoms (age 14), and stressful events during COVID-19 (age 15). *$p < 0.05$ level. **$p < 0.001$.

age 14. Although CR was marginally related to fewer internalizing, but not externalizing, problems in response to the pandemic disruptions of spring 2020, CR did not emerge as a significant mediator of parenting effects on adolescents' mental health during the pandemic. In contrast, adolescents' pre-pandemic reliance on ES predicted significant elevations in both internalizing and externalizing problems during the initial phase of the COVID-19 pandemic and mediation analyses revealed a significant indirect pathway from parental warmth and affection to fewer internalizing problems during COVID-19 through adolescents' reduced reliance on ES. The absence of significant pathways from CR to adolescents' mental health problems and the modest magnitude of the pathway from ES to externalizing problems precluded the emergence of significant indirect effects.

A wealth of research demonstrates that warm and affectionate parenting can facilitate positive adaptation to stressful life events for children (McLaughlin and Lambert, 2017) and adolescents (Howard and Medway, 2004) from all cultural groups (Khaleque, 2013), including in the context of the COVID-19 pandemic (Chang et al., 2021; Cohodes et al., 2021; Wang et al., 2021). Emotion regulation has long been thought to mediate such effects (Morris et al., 2017), though, to the best of our knowledge, the current study offered a novel test of this hypothesis in a relatively large sample of adolescents as they confronted the initial phase of the COVID-19 pandemic. Moreover, whereas studies of parenting, emotion regulation, and adjustment have typically focused on single facets of emotion regulation (e.g., ES *or* CR; Balan et al., 2017) as related to either internalizing *or* externalizing problems (e.g., Walton and Flouri, 2010; Weissman et al., 2021), this investigation offered a comprehensive picture of pathways to adolescents' internalizing and externalizing problems via both CR and ES strategies using a single multiple mediation model. In doing so, this study revealed interesting patterns whereby ES, but not CR, accounted for significant variance in adolescents' internalizing, but not externalizing, problems during the COVID-19 pandemic.

Adolescents who perceive their parents as warm and affectionate may feel more comfortable expressing emotions (Alegre et al., 2014) in ways that garner support for their positive coping with stressors (Cameron and Overall, 2018). In turn, reduced reliance on ES may alleviate the physiological and psychological strain of stress exposure (Gross and Cassidy, 2019), including during the COVID-19 pandemic (Ellis et al., 2020). The salience of ES as a mediator of parenting effects on internalizing problems in this study is consistent with prior cross-sectional work suggesting that insensitive parenting is linked to adolescents' internalizing problems through their increased reliance on ES (Balan et al., 2017). These findings also extend initial data from the COVID-19 pandemic suggesting that stressors related to COVID-19 were related to increased internalizing problems among adolescents who used more ES (Weissman et al., 2021), as well as with research showing that adolescents who had difficulties regulating their emotions prior to the pandemic endorsed more stress and lower social support during the initial months of the pandemic (Essau and de la Torre-Luque, 2021). The moderate effect size of the obtained indirect pathway from parental warmth and affection to adolescents' reduced internalizing symptomatology via decreased reliance on ES is magnified by the universal salience of parenting, emotion regulation, and adaptation in all families such that even a small effect would have substantial practical significance (Funder and Ozer, 2019).

Although warm and affectionate parenting was related to greater use of CR by adolescents prior to the pandemic, CR only marginally predicted fewer internalizing problems during the pandemic and did not emerge as a significant mediator of parenting effects on adolescents' mental health. It may be that CR is less helpful during the initial phase of a crisis because it entails attending to unpleasant stimuli (Moore et al., 2008). It may also be that mid-adolescents have not yet mastered the ability to successfully utilize CR (Ford and Troy, 2019). Thus, as proposed by Sheppes and Gross (2011), these findings suggest that, rather than universally positive or negative, the

TABLE 2 Standardized and unstandardized mediation model estimates.

Variable	*B*	SE	*β*	*p*	95% bias corrected	
					LLCI	ULCI
Covariates						
Female Sex = > Cognitive Reappraisal	0.06	0.07	0.07	0.318	−0.12	0.16
Female Sex = > Expressive Suppression	0.00	0.07	0.00	0.997	−0.14	0.14
Female Sex = > COVID-19 Internalizing	1.97	1.76	0.08	0.264	−1.48	5.42
Female Sex = > COVID-19 Externalizing	0.75	1.74	0.04	0.667	−2.65	4.15
Latine = > Cognitive Reappraisal	0.02	0.07	0.02	0.751	−0.12	0.16
Latine = > Expressive Suppression	−0.08	0.07	−0.08	0.275	−0.22	0.06
Latine = > COVID-19 Internalizing	−0.62	1.71	−0.02	0.719	−3.97	2.74
Latine = > COVID-19 Externalizing	−0.98	1.64	−0.05	0.549	−4.19	2.23
Family Income-to-Needs = > Cognitive Reappraisal	0.01	0.02	0.04	0.569	−0.03	0.06
Family Income-to-Needs = > Expressive Suppression	0.02	0.11	0.06	0.377	−0.02	0.06
Family Income-to-Needs = > COVID-19 Internalizing	−0.50	0.59	−0.06	0.394	−1.66	0.65
Family Income-to-Needs = > COVID-19 Externalizing	−0.19	0.50	−0.03	0.705	−1.18	0.80
Pre-COVID-19 Internalizing = > COVID-19 Internalizing	0.04	0.09	0.04	0.623	−0.13	0.21
Pre-COVID-19 Externalizing = > COVID-19 Externalizing	0.02	0.07	0.02	0.748	−0.12	0.16
COVID-19 Stressors = > COVID-19 Internalizing	**1.42**	**0.31**	**0.33**	**0.000**	**0.82**	**2.02**
COVID-19 Stressors = > COVID-19 Externalizing	**0.75**	**0.32**	**0.20**	**0.018**	**0.13**	**1.37**
Predictor pathways						
Parental Warmth and Affection = > Cognitive Reappraisal	**0.22**	**0.11**	**0.18**	**0.038**	**0.01**	**0.43**
Parental Warmth and Affection = > Expressive Suppression	**−0.23**	**0.11**	**−0.18**	**0.032**	**−0.44**	**−0.02**
Cognitive Reappraisal = > COVID-19 Internalizing	−3.70	1.96	−0.16	0.058	−7.53	0.13
Cognitive Reappraisal = > COVID-19 Externalizing	−1.47	2.13	−0.07	0.492	−5.65	2.71
Expressive Suppression = > COVID-19 Internalizing	**8.21**	**1.91**	**0.33**	**0.000**	**4.48**	**11.94**
Expressive Suppression = > COVID-19 Externalizing	**5.24**	**1.98**	**0.24**	**0.008**	**1.35**	**9.13**
Direct effects						
Parental Warmth and Affection = > COVID-19 Internalizing	1.90	2.47	0.06	0.443	−2.95	6.75
Parental Warmth and Affection = > COVID-19 Externalizing	−1.33	2.28	−0.05	0.561	−5.80	3.15
Indirect effects						
Parental Warmth and Affection = > Cognitive Reappraisal = > COVID-19 Internalizing	−0.83	0.60	−0.03	0.168	−2.01	0.35
Parental Warmth and Affection = > Expressive Suppression = > COVID-19 Internalizing	**−1.90**	**0.96**	**−0.06**	**0.047**	**−3.78**	**−0.03**
Parental Warmth and Affection = > Cognitive Reappraisal = > COVID-19 Externalizing	−0.33	0.51	−0.01	0.520	−1.33	0.67
Parental Warmth and Affection = > Expressive Suppression = > COVID-19 Externalizing	−1.22	0.75	−0.04	0.103	−2.68	0.25
Total indirect effect	**−4.48**	**2.03**	**−0.14**	**0.035**	**−8.25**	**−0.30**
$R^2_{internalizing} = 0.235$; Cohen's $f^2_{internalizing} = 0.307$						
$R^2_{externalizing} = 0.108$; Cohen's $f^2_{externalizing} = 0.121$						

Note: SE, standard error; LLCI, lower limit confidence interval; ULCI, upper limit confidence interval. Female = 1. Latinx = 1. All analyses were conducted using 95% bootstrapped CI. Significant findings are indicated in bold.

effectiveness of specific emotion regulation techniques vary depending on the timing and emotional intensity of a stressor. One implication of this interpretation is that adolescents should be taught a large repertoire of emotion regulation strategies and skills for optimizing strategy selection to the unique demands of a given challenge.

Significant pathways to internalizing, but not externalizing, problems align with prior work examining emotion regulation and psychopathology. Pepping et al. (2016) observed a similar pattern in their study of adolescents' mindfulness and adjustment outcomes, finding that ES, but not CR, mediated the relation between mindfulness and fewer problems of depression and anxiety, but not fewer externalizing problems. In a study of college students' coping with ethnic and racial discrimination, Juang et al. (2016) found that ES predicted higher internalizing, but not externalizing, problems.

The use of ES may be less relevant to externalizing behaviors than more specific aspects of emotion expression, such as direct (i.e., expressing feelings toward the antagonist) versus indirect (i.e., expression of emotion not directed at the antagonist) strategies, which appear especially relevant for understanding externalizing outcomes (Brinke et al., 2021).

The absence of a significant direct pathway from parental warmth and affection to adolescents' internalizing and externalizing problems during the COVID-19 pandemic was unexpected. Given the unique context of COVID-19 as a potent threat to the health of self and others, this finding may point to multiple (and potentially counteracting) pathways from parenting to adolescents' mental health during COVID-19. For example, given well-documented relations between positive parenting and adolescent empathy (Padilla-Walker and Christensen, 2011), some adolescents who perceived their parents as warm and affectionate may also have been more attuned to (and affected by) the distress of parents and others during COVID-19. Likewise, the protective function of warm and affectionate parenting may have been countered by contrasting processes wherein these youth may have experienced heightened anxiety due to worries or concerns about their parent's susceptibility to dying or becoming disabled from COVID-19. Moving forward, it will be important for researchers to elucidate moderating factors to clarify when and for whom these processes hold.

Strengths and limitations

This study evaluated explanatory relations among parenting, emotion regulation, and adolescents' mental health during the initial phase of the U.S. COVID-19 pandemic. Drawing on a relatively large and sociodemographically diverse sample across three data waves, this study filled gaps in the current literature by examining adolescents' internalizing *and* externalizing problems from age 14 (pre-pandemic) to age 15 (early pandemic in spring 2020) as predicted by adolescents' reports of parental warmth and affection at age 12 and explained by adolescents' use of both CR *and* ES emotion regulation strategies at age 14. Despite these strengths, the current findings should be evaluated in consideration of several limitations.

First, the current sample was representative of the Southern California region from which the participants were recruited beginning in 2006 (U.S. Census Bureau, 2007), with particularly valuable representation of Latine participants (i.e., 46.6% of participating adolescents). At the same time, however, the current sample did not reflect the broader ethnic and racial composition of U. S. at the time of the COVID-19 pandemic (U.S. Census Bureau, 2020). Further, the sizes of each ethnic-racial group in the broader sample were too small to support our evaluation of the proposed model within each group. Although supportive parenting practices, such as warmth and affection, demonstrate consistently positive relations with adolescent development across diverse cultural and experiential contexts (Masten et al., 2004; Khaleque, 2013), research has shown significant variation in the adaptive significance of other parenting facets across groups (e.g., authoritative parenting; Chao, 2001; physical punishment; Deater-Deckard et al., 1996). Thus, it will be important to test indirect pathways among parenting, emotion regulation, and adolescent adaptation using a larger and more diverse nationally representative probability sample in future research.

Second, this study focused on only two emotion regulation strategies, leaving many additional strategies (e.g., avoidance, rumination; McRae and Gross, 2020) and distinctions (e.g., direct versus indirect expression; Brinke et al., 2021) unexamined. Further, the reliability for ES was acceptable, but modest. Moving forward, researchers should examine additional emotion regulation techniques individually and potentially collectively using well-validated measures. For example, some data point to the additional explanatory power afforded by attending to a combination of emotion regulation approaches (e.g., profile analysis; van den Heuvel et al., 2020), rather than only to individual strategies.

Third, although this longitudinal design with pre-pandemic controls supported directional interpretations of these findings, we were not able to evaluate causal assertions fully in the absence of prior emotion regulation strategy use patterns at age 12 to support a fully cross-lagged model. Consistent with broader models of child effects (Bell and Chapman, 1986), adolescents who utilize certain emotion regulation strategies or who struggle with specific socioemotional difficulties may evoke different degrees of warm and affectionate parenting. Future investigations that include measures of all variables at all waves would be best suited to evaluate the likely bidirectionality of these relations and strengthen causal claims about parental influences on adolescents' emotion regulation and resulting psychopathology in the face of major stressors.

Fourth, this investigation was limited to self-report measures, which may have inflated observed relations due to shared method variance or distorted them due to informant bias. In particular, the obtained pathway to internalizing, but not externalizing, problems may reflect known tendencies for adolescents to report their externalizing behaviors less accurately as compared to parent reports or clinician diagnoses (Penney and Skilling, 2012). Future research will benefit from evaluating the current explanatory model using observational data and multi-informant reports from parents, teachers, and/or clinicians.

Finally, the low stability of internalizing and externalizing problems from ages 14 (pre-pandemic) to 15 (early pandemic) was surprising. Although the COVID-19 pandemic restrictions demanded a shift to online data collection methods, prior data support the validity of online data collection using the YSR (Achenbach et al., 2004). This instability may reflect the shift from a 6-month to 2-week symptom period to capture early-pandemic behavior problems and/or true instability in symptom expression across the transition into the pandemic. However, post-hoc analyses examining symptom stability in YSR reports across ages 12, 14, and 15 in this sample indicated that the phone-based administration of the YSR at age 14 may have biased adolescents' reports during this assessment. Whereas YSR administrations at ages 12 in the lab and 15 on-line during the pandemic showed strong stability for both internalizing [$r(145) = 0.346$, $p < 0.001$] and externalizing [$r(145) = 0.478$, $p < 0.001$] problems across a three-year period, stability values were modest for externalizing problems [$r(150) = 0.202$, $p = 0.013$] and nonsignificant for internalizing problems [$r(150) = 0.095$, $p = 0.243$] from ages 12–14, even though both administrations occurred prior to the pandemic and over a shorter period of time than ages 12–15. Indeed, the lowest stabilities were seen across the one-year period spanning from the pre-pandemic phone assessment at age 14 to the COVID-19 on-line assessment at age 15 in the current study.

Implications and conclusion

Accumulating data points to ongoing and negative effects of the COVID-19 pandemic on adolescent development (Samji et al., 2022). As noted in the U.S. Surgeon General's Advisory on youth mental health during the COVID-19 pandemic, it is imperative to understand how to support adolescents as they navigate this and future challenges. Extant research demonstrates that parenting is a strong and enduring influence on adolescents' socioemotional development, one with heightened salience in stressful contexts, such as the COVID-19 pandemic. Moreover, parenting is readily modified by both parent- and family-centered approaches (Ryzin and Dishion, 2012).

This study illuminated the importance of warm and affectionate parenting for adolescents' emotion regulation strategy use. Teaching adolescents to be more expressive about their emotional experiences and to rely less on ES as an emotion regulation strategy can help them to cope with some of the anxiety and distress associated with the COVID-19 pandemic (and other stressors). Prior intervention studies suggest that adolescents can be taught a range of emotion regulation strategies (Houck et al., 2016), as well as how to flexibly engage such strategies in ways that maximize their positive adaptation (Eadeh et al., 2021). As the COVID-19 pandemic presents new variants and new viruses gain traction (e.g., monkeypox), efforts to help parents create warm and affectionate relational environments that encourage adolescents' emotional expression, or at least deter them from engaging ES strategies, can be mobilized to protect promote adolescents' mental health.

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 California, Riverside. 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

TMY contributed to conception and design of the study. AMB organized the database. AMB and LK performed the statistical analysis. AMB wrote the first draft of the manuscript. All authors contributed to manuscript revision, read, and approved the submitted version.

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Conflict of interest

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

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Parenting style and children emotion management skills among Chinese children aged 3–6: the chain mediation effect of self-control and peer interactions

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Drawing on ecosystem theory, which is based on the interaction of family environment, individual characteristics, and social adaptation, this study aimed to examine the effects of parenting style on emotion management skills and the mediating roles of self-control and peer interactions among Chinese children aged 3–6 years. Some studies have investigated the relationship between parenting style and emotion management skills. However, research on the underlying mechanisms is still deficient. A sample of 2,303 Chinese children completed the PSDQ-Short Version, the Self-Control Teacher Rating Questionnaire, the Peer Interaction Skills Scale, and the Emotion Management Skills Questionnaire. The results show that: (1) Authoritarian parenting style negatively predicted children's emotion management skills, self-control, and peer interactions; (2) Authoritative parenting style positively predicted children's emotion management skills, self-control, and peer interactions; (3) Structural equation models indicated that self-control and peer interactions partially mediated the effects of authoritarian and authoritative parenting styles. The parenting style of Chinese children aged 3–6 years is related to emotion management skills, and self-control and peer interactions have chain mediating effects between parenting style and children's emotion management skills. These results provide further guidance for the prevention and intervention of emotional and mental health problems in children.

KEYWORDS

authoritarian parenting style, authoritative parenting style, emotion management skills, self-control, peer interactions, chain mediating effects, Chinese children

Introduction

Behavioral and emotional difficulties commonly occur during childhood, often without recognition or awareness, yet they have a profound impact on mental well-being and behavioral patterns. Early and middle childhood encompass a broad spectrum of behavioral issues in children, including defiance, tantrums, aggression, and destructive tendencies (American Psychiatric Association, 2013). In the late 20th century, concerns arose regarding the rising prevalence of emotional and behavioral problems among children and adolescents, leading to an interest in addressing and modifying these secular trends (Rutter and Smith, 1995). Recent nationally representative data from the NSCH reveals the widespread occurrence of depression, anxiety, and conduct problems among children and adolescents in the

United States (Ghandour et al., 2019). Based on a report released by the National Center on Birth Defects and Developmental Disabilities from 2005 to 2011, it is approximated that around 13–20% of children in the United States face a mental, emotional, or behavioral disorder each year (Avenevoli et al., 2013). Increased levels of aggression have been associated with emotional instability (Carlo et al., 2011; Mestre et al., 2012), as well as addictive behaviors, conduct issues, and borderline personality (Mehroof and Griffiths, 2010). However, a preschooler's ability to conform to societal behavioral standards is influenced by both emotional comprehension and regulation (Di Maggio et al., 2017). Generally, possessing strong emotional management skills indicates adaptability and good health, while inadequate management can contribute to individual social maladjustment and behavioral problems. Neglecting to address these issues leads to considerable societal expenses and places a substantial burden on individuals and communities (Scott et al., 2001; Romeo et al., 2006), underscoring the importance of timely intervention.

Individual variations in emotional tendencies may serve as an implicit underlying factor influencing the diverse externalizing behaviors observed in children. However, the factors that shape children's ability to regulate their emotions are intricate and multifaceted. Parenting styles within the familial context exert a substantial direct or indirect impact on children's emotional and mental well-being, receiving considerable attention in the field of child growth and development both domestically and internationally (Ong et al., 2018; Feng et al., 2021; Rongeven et al., 2022). Numerous studies have explored the association between childhood anxiety disorders (Sahithya and Raman, 2021), emotional well-being (Le and Impett, 2019), oppositional defiant disorder (Fooladvand et al., 2021), and parenting styles. Additionally, research has investigated the efficacy of the Emotional Development (ED) module of Parent–Child Interaction Therapy (PCIT) in treating early childhood depression (Luby et al., 2020). However, few studies have delved into the intricate mechanisms through which various parenting styles influence children's emotion regulation skills, exploring the complex and intriguing network of relationships involved. Spanish researchers approached psychological research on children aged 4–6 years from the sociocultural perspective of psychological development theory, proposing the Morris triple model of early childhood adjustment (Badenes et al., 2000), which serves as the theoretical foundation for this study. The model comprises three components: (a) family factors influencing individual emotions, (b) the impact of young children's social adjustment on individual emotions to varying degrees, and (c) the influence of family factors on young children's adjustment. In this study, parenting style represents the family aspect, children's emotion regulation skills represent the individual emotion aspect, and factors influencing young children's social adjustment encompass their self-control abilities (Wang et al., 2019) and peer interactions (Badenes et al., 2000; Domberg et al., 2018). Consequently, parenting styles not only directly affect children's emotional well-being but also exhibit lasting effects on their psychological characteristics and the development of peer relationships. The development of self-control and peer interactions has been shown to be significantly influenced by family factors, particularly parenting styles and behaviors (Russell et al., 2013; Wang et al., 2019; Ahmetoglu et al., 2022). Therefore, investigating the mechanisms through which parenting style influences children's emotion regulation skills is essential. The objective of this study was to examine the impact of parenting style on children's emotion regulation skills and the mediating roles played by self-control and peer interactions.

The effect of parenting style on emotion management skills

The family plays a pivotal role in a child's growth, yet other influential environments, including schools (Chao, 2001; Veiga et al., 2021) and peer groups (Maccoby and Martin, 1983; Martinez-Escudero et al., 2023), also contribute to their development. Both parental involvement theory and bioecological theory indicate that parenting style significantly influences the healthy development of children's emotion management skills (Morris et al., 2007; Luo et al., 2019). Parenting styles encompass a range of parental attitudes and behaviors toward raising children (Darling and Steinberg, 1993), reflecting the quality of children's interactions with family members and their emotional well-being. Parenting approaches can be characterized by integrating two core dimensions: responsiveness and demandingness (Lamborn et al., 1991; Villarejo et al., 2023). These dimensions, namely responsiveness and demandingness, are typically seen as independent of each other (Darling and Steinberg, 1993; Fuentes et al., 2022). The term "responsiveness" captures a parent's warmth, active involvement, and ability to nurture a child's unique personality (Baumrind, 1991; Climent-Galarza et al., 2022). On the other hand, "demandingness" describes the level of strictness and expectations parents set for their children in aligning with societal or familial norms (Steinberg et al., 1994; Palacios et al., 2022). Within this dual-dimensional framework, several scholars have outlined specific parenting categories. These include authoritative (high in both responsiveness and demandingness), authoritarian (high demandingness, low responsiveness), neglectful (low in both dimensions), and indulgent (high responsiveness, low demandingness) as common classifications in familial research (Lamborn et al., 1991; Steinberg et al., 1994; Villarejo et al., 2023). Baumrind's work (Baumrind, 1968; Baumrind, 1971) has distinguished between permissive-indulgent and permissive-neglectful parents, noting both a variance in levels of parental responsiveness and resultant child outcomes (Lamborn et al., 1991; Martinez-Escudero et al., 2020). Interestingly, children from families emphasizing responsiveness but lacking in demandingness often exhibit better adaptability and skills compared to their counterparts from neglectful households. Building on Baumrind's foundational theoretical approach, Maccoby and Martin (1983) advanced the classification of parenting styles into four distinct categories: authoritative, authoritarian, indulgent, and neglectful. Interestingly, parenting styles and their impacts vary across cultures (Pinquart and Kauser, 2018; Martinez-Escudero et al., 2023). The cultural backdrop can significantly influence the dynamics between parenting methods and child adjustment (Pinquart and Kauser, 2018; Garcia et al., 2019). Considering China's rich cultural tapestry deeply rooted in Confucian principles, parenting often mirrors its hierarchies and moral teachings. Such teachings promote understanding and respecting familial hierarchies and social statuses. Chinese societal norms value a child's proper upbringing, which emphasizes elements of guidance and discipline. Therefore, parents may employ stern disciplinary measures if children fall short of set expectations, viewing this strictness as their responsibility (Chao, 1994). This rigorous parenting instills in the young an understanding

of their roles within family and society, facilitating their smooth societal integration (Pan and Shang, 2023). In studies of European-American families, an authoritative approach frequently emerges as optimal for child development (Maccoby and Martin, 1983; Lamborn et al., 1991; Steinberg et al., 1994). However, China's competitive social fabric has intensified parental involvement in children's upbringing. There's an evident trend of parents being increasingly directive yet responsive to their children's needs, with neglectful parenting being a rarity (Henry et al., 2020; Liu F. et al., 2020; Liu J. et al., 2020; Vogel et al., 2021). Contemporary young Chinese parents are veering toward promoting children's independence, challenging the traditional norm of grandparents' indulgence. This change has led to a decline in overly permissive parenting practices (Scharff, 2022; Lin et al., 2023; Guo J. et al., 2023). Research by Wu (1996) suggests that Chinese parents frequently resort to reprimands to guide their children's behavior, particularly in academic realms, reflecting an authoritarian approach (Kriger and Kroes, 1972; Lin and Fu, 1990). Interestingly, recent studies from European and South American contexts highlight the potential advantages of high responsiveness combined with low demandingness (Gimenez-Serrano et al., 2022; Martinez-Escudero et al., 2023; Villarejo et al., 2023). Historically, China has emphasized social harmony and order. Consequently, in Chinese familial contexts, most parents not only respond to their children's expressions and actions but also set expectations for their emotional and behavioral conduct. An authoritative approach resonates with many Chinese parents, aligning with the cultural ethos of balance. In general, several studies focusing on Chinese-American families have identified the benefits of the authoritative style (Chao, 1994, 2001). Therefore, it can be argued that the two primary parenting styles, authoritative (characterized by both responsiveness and demandingness) and authoritarian (characterized by responsiveness without demandingness), are most prevalent in Chinese families. This research aimed to determine which of these two styles is optimal.

Researchers have long studied the mechanisms through which parenting styles influence children's emotional health (Li J. B. et al., 2019; Li Y. et al., 2019). This research complements and builds upon Gottman's classification of parenting styles related to emotion (Gottman et al., 1996). However, studies have typically reported differential manifestations of children's emotional dysregulation (Camisasca et al., 2022), emotional monitoring and behavioral problems (Haslam et al., 2020) under different parenting styles, or the profound impact of children's perceived parenting style on their mental health (Feng et al., 2021). Nevertheless, little in-depth research has been conducted on the complete system of children's emotion management skills. According to family systems theory (Bowen, 1993), the degree of individual socialization determines how individuals experience emotional states, and at the same time, the degree of individual emotionalization is closely related to personal, family, and cultural contexts (Lewis, 1995). Thus, the family has been described as the primary environment for children's emotional establishment and social adjustment patterns. Research has shown that authoritarian parenting styles (e.g., discipline, control, say no) negatively affect children's emotional and psychological stability (Kawabata et al., 2011). Additionally, in Helping Families Change, Satir et al. (1994) suggest the importance of family communication theory, which states that 93% of emotional states in parent–child conversations are perceived by each other, and that an emotionally unstable or impulsive child who elicits a hostile parental response may make the child's response more aggressive than the child's response prior to the parent's response (Wahl and Metzner, 2012). In contrast, authoritative parents employ positive emotional communication, characterized by active listening, understanding, and positive recognition, along with consistent rules for their children, which positively influences their children's emotional management and psychological adjustment (Khaleque, 2013). Family systems theory highlights the critical impact of overall family system stability, harmony, and health on children's emotional and psychological development (Lindahl et al., 2012). While numerous theoretical and empirical studies have demonstrated the influence of parenting styles on children's emotion management skills, the role of protective factors has been relatively understudied. Firstly, research on self-control in school-aged children suggests that parent-grandparent co-parenting can predict children's self-control through maternal authoritative parenting, and authoritative parenting itself is associated with children's self-control (Yang et al., 2023). Pratt and Cullen (2000) meta-analysis have unequivocally shown that low self-control is significantly and positively correlated with involvement in crime and deviant behaviors. Additionally, Gibbs et al. (1998) found that low self-control mediated a substantial portion of the effect of parenting on college deviance, encompassing behaviors such as alcohol use, class-cutting, academic dishonesty, and school suspension or expulsion. Secondly, punishment and harsh parenting styles can have adverse effects on children, which can be magnified within peer interactions, leading to disharmony in social relationships (Shen et al., 2015). The effects of these variables may manifest not only in the short term but also during long-term developmental processes. In fact, detrimental effects on peer relationships, such as becoming targets of exclusion and bullying, can arise from characteristics of the parent–child relationship, including abusive, neglectful, or maladaptive parenting (Reijntjes et al., 2010, 2011; Lereya et al., 2013). Both children's self-control and peer interactions exert powerful influences on their emotion management skills. Studies have indicated that individuals with higher levels of peer interactions and self-control tend to hold more positive beliefs about managing negative emotions and expressing positive emotions (Chow et al., 2015; Meng et al., 2020). Consequently, we hypothesize that both self-control and peer interactions mediate the relationship between parenting style and children's emotion management skills. We proposed that parenting style is related to children's emotion management skills (hypothesis one). We expect that authoritative parenting will have a positive correlation with children's emotion management skills, while authoritarian parenting will have a negative correlation.

The mediating effect of self-control between parenting style and emotion management skills

The ability of children to consciously regulate their behavior in order to meet their specific needs contributes to enhanced focus, improved social adjustment, and effective coping with negative emotional experiences such as pain and frustration (Chen et al., 2012). Self-control refers to an individual's capacity to regulate behavior, emotions, and various other responses in a timely manner to accomplish specific goals and serves as a significant indicator of early socialization (Moffitt et al., 2011). It encompasses attentional aspects,

such as the ability to shift or sustain attention, as well as behavioral aspects, such as inhibiting impulses or undesirable behaviors (Duckworth and Kern, 2011). The initiation hypothesis of the psychological mechanisms of self-control (Mischel and Ayduk, 2002) suggests that children's attention, cognition, and emotions mature as they develop self-control, with higher levels of self-control reducing an individual's arousal in emotionally charged situations and regulating emotional expression and impulsive behaviors. Prior studies have established a significant correlation between self-control and prosocial behavior among children and adolescents, indicating that individuals with higher levels of self-control are more likely to exhibit prosocial acts (Carlo et al., 2012). Children experiencing challenges in self-control are susceptible to emotional and behavioral issues (Chui and Chan, 2015). Inadequate regulation of negative emotions can contribute to chronic emotional distress, leading to elevated levels of anxiety and depression (Nigra et al., 2015), ultimately manifesting as irritable moods and pathological behaviors commonly associated with autism. Therefore, adequate self-control facilitates individuals in planning their actions, managing their emotions, conserving ego-depleting resources, and effectively anticipating conflict precursors, making it easier to maintain emotional stability in the face of arbitrary outcomes (Hofmann et al., 2009).

Furthermore, the development of self-control is significantly influenced by family dynamics, particularly parenting styles (Russell et al., 2013). Authoritarian parenting styles, characterized by frequent negative emotions and caregiver disengagement, can hinder children's adaptive efforts to regulate their behavior and impede the cultivation of self-control (Harrist and Waugh, 2002; Li et al., 2015). Parental rejection and excessive intervention have been found to predict children's low self-control, as well as heightened levels of anger, anxiety, and aggression (Wang et al., 2015). The imposition of high levels of parental control and intervention may suppress children's intrinsic motivation, subsequently limiting their exploration and adaptation abilities (Guan et al., 2018). Additionally, research suggests that individuals with higher levels of self-control demonstrate better regulation of mood and emotions, whereas poor self-control is associated with anxiety and depression (Özdemir et al., 2014; Yen et al., 2014; Pan et al., 2021). Given that poor self-control serves as a risk factor for mood disorders, it may contribute to comorbidity between anxiety-depression, substance use, and Internet addiction during later childhood (Na et al., 2017). Some empirical studies have shown that authoritative parenting facilitates children's perceptions of behavioral autonomy, so that children believe they can make and stick to their own decisions (Yu et al., 2013), have a better sense of control and accomplishment over themselves, and reinforce their positive behaviors. Children with high levels of proprioceptive self-control have fewer externalizing problems and less dissociative distress, and are more socially competent with skills to control negative emotions, get along with others, and follow social rules (Spinrad et al., 2007; Sun et al., 2022). Calm thinking and stable emotion management allow them to focus their energy and time on solving practical problems, prefer a positive view of things, and have an optimistic personality (Baesu, 2019; Li J. B. et al., 2019; Li Y. et al., 2019). The presence of positive interactions, coupled with authoritative parenting, is linked to enhanced self-control outcomes in children throughout their developmental stages. For instance, children who engage in more mutually positive and prosocial interactions with their caregivers exhibit improved behavioral and emotional regulation (Kim and Kochanska, 2012; Davis et al., 2017). Therefore, based on the aforementioned research, we hypothesized that self-control could mediate the effects of parenting style on children's emotion management skills (hypothesis two).

The mediating effect of peer interactions between parenting style and emotion management skills

Group dynamics theory suggests that as children grow older, the proportion of peer group participation in children's lives will increase substantially, and that interactions in different social situations will satisfy children's intrinsic values (Lewin, 1948; Burnes and Bargal, 2017). Peer acceptance is closely related to emotional perception and positive personality (Beazidou and Botsoglou, 2016). Peer interactions is the comprehensive ability of young children to perceive, adapt, coordinate, and manage peer relationships during interactions with peers of the same or similar age (Jiang et al., 2015). Children's peer interactions play an important role in children's emotion management skills, the better children's peer interactions are, the more they promote children's ability to identify their own and others' emotions, manage their bad emotions, and use positive emotions to make better decisions (Mayer et al., 2004). Children who are unpopular, rejected, and ostracized by their peers often develop inappropriate emotional expressions and behavioral conflicts, but inappropriate emotions and behaviors can be observed, learned, imitated, and corrected through peer interactions to reshape emotional perceptions and have stable emotion management. When children's ability to recognize expressions and select emotion perspectives is better developed, they are more likely to be accepted by their peers (Denham and Couchoud, 1990). Therefore, children's peer interactions are one of the necessary conditions to determine their level of emotion management skills.

The tendency to exhibit behavioral deficits or excessive behavior increases with poorer peer interactions, and the lack of social skills leading to peer alienation predisposes to the development of autism spectrum disorder (ASD), which interferes with normal interpersonal interactions in adulthood (Corbett et al., 2014). Social learning theory states that children tend to develop their own patterns of interpersonal interactions by observing their parents' everyday interactive behaviors (Bandura, 1976; Ladd and Kochenderfer-Ladd, 2019). Safdar and Zahrah (2016) found that children raised by authoritative parents were more dominant in peer interactions, more likely to integrate into groups and be accepted by peers, and had a significant positive correlation with peer cooperation behaviors (Lau and Power, 2020). Children with authoritarian parenting, on the other hand, are overly dependent on parents, have less self-control, are more likely to exhibit disobedient behavior, have poorer peer interactions, and often suffer from peer rejection (Lee and Wong, 2009). This situation can increase children's pride or low self-esteem, and even lead to school bullying, social withdrawal, and self-blocking behaviors, resulting in negative emotional experiences and negative social relationship evaluations (Zheng et al., 2019).

In a study conducted in Spain, the examination of parenting style and peer attachment as predictors of emotional instability in late childhood revealed that both parenting style and peer group played equally significant roles in predicting emotional instability among children (Llorca-Mestre et al., 2017). The findings align with the

principles of ecological theory (Bronfenbrenner, 1979), which emphasize the continuous interaction between individual characteristics and their context. According to this theory, individual characteristics evolve and develop over time through ongoing interactions with their environment (Bronfenbrenner and Ceci, 1994). Therefore, when children's emotional needs are not met by their parents, contextual interactions among peers play a compensatory role in children's emotional management. Children may be able to learn from their peers how to control their emotions, suppress unreasonable desires, coordinate with others, and rationally handle peer conflicts (Wang et al., 2019). When children can correctly understand their peers' basic mental states, such as thoughts, intentions, and emotions, and can predict and interpret their peers' behavior through emotional transference, they will have normal, friendly interactions with their peers and perform better on tasks (Astington and Barriault, 2001). Children who are unpopular, rejected, and ostracized by their peers are more likely to experience bullying (Zhu et al., 2020) and may become more sensitive to frustration, which can further exacerbate levels of problem behavior and contribute to impaired interactions and poor social adjustment in adolescence (Buhs and Ladd, 2001). These negative childhood experiences can further increase a child's withdrawal behaviors and rejection of peer interactions, resulting in a withdrawn personality disorder (Guina, 2016; Bang et al., 2018). There is a strong correlation between children's emotion management and well-being and parenting styles and children's peer interactions (Malonda et al., 2019; Zhang and Deng, 2022). Therefore, we hypothesized that parenting styles may be predictors of peer interactions, such that authoritarian parenting styles negatively predict peer interactions, whereas authoritative parenting styles positively predict peer interactions. Based on the aforementioned research, we hypothesized that peer interactions would mediate the effects of parenting style on children's emotion management skills (hypothesis three).

The mediating effect of self-control and peer interactions between parenting style and emotion management skills

Existing research has demonstrated the protective influence of both self-control and peer interactions on the development of children's emotion management skills (Li et al., 2013; Xu et al., 2021). Moreover, parenting style indirectly affects children's emotion management skills through the mediating factors of self-control and peer interactions, forming a chain mediating process within the relationship (Erkan and Sop, 2018; Farzadi et al., 2021). Consequently, there is a crucial need for comprehensive investigations into the mechanisms through which parenting styles impact children's emotion management skills. However, limited studies have directly explored the interplay between self-control, peer interactions, and their mediating effects on the association between parenting styles and children's emotion management skills. Therefore, this study aims to examine the relationship among these four variables by drawing upon relevant theoretical frameworks and empirical evidence.

Multiple research studies have consistently demonstrated that children's ability to exercise self-control contributes positively to their social adjustment and interactions with peers. Drawing from a situational-developmental theory perspective, children's self-control plays a significant role in shaping their preferences for peers, thereby influencing the development of emotional stability in later stages (Llorca-Mestre et al., 2017). Children with high levels of self-control exhibit better regulation of their behavior and emotions, leading to more appropriate and positive interactions with peers. Consequently, favorable group preferences contribute to higher levels of peer status and act as a protective factor against internalization problems in children (Heinrich and Gullone, 2006). In contrast, children with low self-control tend to interpret social cues in group settings as threatening or hostile toward themselves, which can trigger intense emotional reactions and a hostile disposition, making them more prone to engaging in bullying behaviors (Plexousakis et al., 2019; Camodeca and Nava, 2022). It is evident that high levels of self-control are associated with increased opportunities for social interactions, which, in turn, impact children's ability to engage with peers, form social relationships, enhance their sense of belonging, and foster positive emotional experiences during peer interactions. Additionally, Chinese parents place a strong emphasis on fostering their children's socialization, including the control of negative emotions and the suppression of desires to prioritize group interests and attain a favorable position within peer relationships (Liu et al., 2017). Given the link between children's self-control and their peer interactions—both of which jointly and adaptively moderate and manage their emotions and behaviors—this study proposes a third pathway. We speculate that parenting styles impact children's emotion regulation skills through a chain mediation process that involves both self-control and peer interactions (hypothesis four).

Materials and methods

Participants

A total of 2,397 participants were recruited from 16 kindergartens (both public and private) in 10 provinces in seven geographic regions (northern, eastern, southern, central, northwestern, southwestern, and northeastern) of China using stratified cluster sampling. Data collection took place at the start of the spring school year in 2023. Prior permission was obtained from the schools, and written informed consent was obtained from both parents and teachers of the participants. The informed consent forms ensured anonymity and confidentiality and did not require signatures or include subject names. Parents and teachers were clearly informed that participation in the study was voluntary, and they had the right to withdraw at any time. Those who agreed to participate independently completed the paper-and-pencil questionnaire during the parent-teacher conference, with the guidance of a trained research assistant. After completion, the questionnaires provided by the children's parents and teachers were sealed in envelopes. A small token of appreciation, such as a flower or snack, was given to participants as a gesture of gratitude. Upon screening, 94 questionnaires were identified as invalid due to significant missing information. Thus, a total of 2,303 questionnaires were included in the final analysis, resulting in an overall response rate of 96.08%. Participants were aged 3–6 years ($M = 4.00$, SD = 0.499), 1,180 (51.2%) were boys and 1,123 (48.8%) were girls, 1,082 (34.0%) were in junior class, 782 (34.0%) in middle class, 737 (32.0%) in senior class. The two questionnaires were completed by 476 fathers and 1,827 mothers. These participants were categorized into three age groups

($M = 31.00$, SD = 0.532): 229 were under 30 years of age, 1,702 were between 30 and 40 years of age, and 372 were over 40 years of age.

Before the survey was started, the local education department and the survey schools were consulted to obtain their approval to conduct the study. During the survey, we asked the principal and teachers about the basic conditions of the campus, and the researcher informed the parents and teachers about the purpose and procedures of the study and administered the questionnaires. The questionnaires were administered in the classroom, where teachers conducted parent-teacher conferences with parents. Participants provided written consent before completing the study questionnaire and were informed of the purpose, confidentiality, and anonymity of this study.

All study materials in this study were reviewed and approved by the research ethics committee of the corresponding author's university.

Instruments

Parenting styles and dimensions questionnaire-short version

The PSDQ-Short Version (Robinson et al., 2001) with 27 items is a modified version of the original 62-item PSDQ (Robinson et al., 1996), developed to measure parent's self-own behavior and report their behavior with children. The shortened version of the PSDQ consists of two dimensions: authoritarian parenting style and authoritative parenting style, and was completed by the parents. An example item is "I punish my children by excluding them, without explanation". Each item based on a 5-point Likert-type scale ranging from 1 (Never) to 5 (Always). The scale has been shown to have good reliability and validity. Also, it has shown excellent psychometric properties in the Chinese subject population (Robinson et al., 2001; Li et al., 2012). In this study, the Cronbach's alpha coefficient of the subscales of authoritarian parenting style and authoritative parenting style were 0.95 and 0.92, respectively.

Self-control teacher rating questionnaire

The 22-item Self-Control Teacher Rating Questionnaire (SCTRQ) (Dong, 2005) is a modified version of the original 33-item Self-Control Rating Scale (SCRS-C) by Kendall and Wilcox (Kendall and Wilcox, 1979). The SCRS was developed to assess children's levels of self-control and is evaluated by their teachers. An example item is "The child can stop what he or she is doing to listen when the teacher starts talking." Items in the questionnaire are scored on a five-point scale. There are questions with reverse scoring (questions 17 and 22), and the questionnaire encompasses a total of four dimensions. Evidence has been provided in studies of the effects of parenting practices and self-control on problem behavior in left-behind and non-left-behind children in rural China (Zhang et al., 2023). The Cronbach's alpha coefficient of the scale in this study was 0.94.

Peer interaction skills scale

The Peer Interaction Skills Scale (PISS) (Zhang, 2002; Qin, 2022; Qin and Caizhen, 2022) was designed to assess children's peer interaction skills. It encompasses four dimensions: social initiative, verbal and non-verbal interactions, social barriers, and pro-social behavior. Vandell (2000) noted that teachers can influence children's peer interaction skills through their own perceptions of the classroom. Therefore, the questionnaire was completed by the teachers based on the children's daily learning and living performance. A sample item reads, "The child can proactively introduce himself/herself to new peers." The PISS contains four dimensions measured on a four-point scale. The higher the total score, the higher the level of peer interaction skills. In this study, the Cronbach's alpha of this scale was 0.84.

Emotion management skills questionnaire

The 30-item Emotion Management Skills Questionnaire (EMSQ) (Wu, 2013; Qiu et al., 2021) comprises three dimensions and is completed by teachers, who assess children's daily emotional expressions and reactions. The questionnaire contains 11 items related to emotion perception skills, 13 items focused on emotion regulation skills, and 6 items assessing emotion utilization skills. Emotion perception refers to the child's ability to accurately identify both their own and others' emotional states, as well as to perform preliminary analyses to express emotions appropriately (e.g., "The child notices when the moods of friends around them change"). Emotion regulation pertains to the child's ability to manage their emotions in accordance with organizational norms specific to a given situation (e.g., "The child takes the initiative to stop a fight between peers"). Emotion utilization skills involve the child's capability to convey emotions appropriately through facial expressions and behavior to foster positive interpersonal relationships (e.g., "When they are happy or sad, they do not display it overtly and tend to appear emotionally reserved"). Each item is measured using a 5-point Likert scale to evaluate the child's ability to manage their emotions effectively. The higher the score of children's emotional management skills scale，the better the children's ability to maintain their own emotional stability. In this study, the Cronbach's alpha coefficient of the subscale in the present study was 0.94.

Data analysis

Statistical analysis in this study was conducted using SPSS 26.0 and Mplus 8.3. First, we used Harman's one-way method to test for the presence of common method bias (Zhou and Long, 2004). Second, we completed descriptive statistics and Pearson correlation analysis on all study variables by running SPSS 26.0. Considering that gender, age, and grade level may be additional influencing factors for children aged 3–6 years, we decided to control for these variables in the analysis. Third, structural equation modeling (SEM) was used to examine mediating effects. To explore the mediating effects of children's self-control and their peer interactions in the pathway of parenting styles on children's emotion management skills, we conducted variable-by-variable analyses of authoritative and authoritarian parenting styles to assess a diverse set of hypotheses. Finally, the bootstrap method (Tibshirani and Efron, 1993) was used to repeat the sample 5,000 times to test the mediating effect of children's self-control and peer interactions in the pathway of parenting style on children's emotion management skills.

Results

Common method bias test

Harman's one-way method was used to test for the existence of common method bias (Zhou and Long, 2004). Exploratory factor analysis resulted in 12 factors with eigenvalues greater than 1. The first factor accounted for 36.90% of the total variance, which is less than

40% of the critical standard, indicating that common method bias is not apparent. Therefore, data analysis can proceed.

Descriptive statistics and significance test

Bivariate correlations between the core variables were performed using Pearson correlation analysis. The results are presented in Table 1, including the means, SDs, and Pearson correlation coefficients of the core variables. The results indicated that all the core variables were significantly related. Emotion management skills were negatively associated with authoritarian parenting style ($r = -0.640$, $p < 0.001$), but positively associated with authoritative parenting style ($r = 0.733$, $p < 0.001$), self-control ($r = 0.723$, $p < 0.001$), and peer interactions ($r = 0.700$, $p < 0.001$). Authoritarian parenting style was negatively associated with self-control ($r = -0.656$, $p < 0.001$) and peer interactions ($r = -0.570$, $p < 0.001$). Whereas authoritative parenting style was positively associated with self-control ($r = 0.586$, $p < 0.001$) and peer interactions ($r = 0.602$, $p < 0.001$). In addition, self-control was positively associated with peer interactions ($r = 0.663$, $p < 0.001$).

Total effect, direct effect, and indirect effect of the chain mediating effect

A chain mediation model was tested, which consisted of three indirect effects as follows: (1) self-control played a mediating role in the relationship between parenting styles and children's emotion management skills; (2) peer interactions mediated the relationship between parenting styles and children's emotion management skills; and (3) parenting styles may indirectly affect children's emotion management skills through the chain mediation of self-control and peer interactions (Figure 1).

The SEM was used to examine the mediating effects of self-control and peer interactions between parenting styles and emotion management skills. The results showed that authoritarian parenting style and emotion management skills established significant and negative relationships ($\beta = -0.640$, $t = -52.028$, $p < 0.001$). After accounting for the influences of control variables, the mediation model showed that authoritarian parenting style had a significant negative direct effect on both self-control ($\beta = -0.659$, $t = -49.244$, $p < 0.001$) and emotion management skills ($\beta = -0.100$, $t = -5.080$, $p < 0.001$). Meanwhile, self-control had a significant positive direct effect on both the peer interactions ($\beta = 0.725$, $t = 40.725$, $p < 0.001$) and emotion management skills ($\beta = 0.329$, $t = 12.201$, $p < 0.001$). The peer interactions had a significant positive direct effect on emotion management skills ($\beta = 0.532$, $t = 122.453$, $p < 0.001$; see Figure 2).

As shown in Figure 3, authoritative parenting style had a significant positive direct effect on self-control ($\beta = 0.591$, $t = 39.157$, $p < 0.001$), peer interactions ($\beta = 0.304$, $t = 15.867$, $p < 0.001$), and emotion management skills ($\beta = 0.315$, $t = 19.139$, $p < 0.001$). Self-control had a significant positive direct effect on both peer interactions ($\beta = 0.633$, $t = 35.437$, $p < 0.001$) and emotion management skills ($\beta = 0.338$, $t = 14.527$, $p < 0.001$). Peer interactions had a significant

TABLE 1 Descriptive statistics and correlation analysis of all the variable.

	1	2	3	4	5
1. Authoritarian parenting style	–				
2. Authoritative parenting style	−0.584***	–			
3. Self-control	−0.656***	0.586***	–		
4. Peer interactions	−0.570***	0.602***	0.663***	–	
5. Emotion management skills	−0.640***	0.733***	0.723***	0.700***	–
Mean	2.925	3.889	3.529	2.717	3.747
SD	0.476	0.760	0.958	0.407	0.618

*$p < 0.05$, **$p < 0.01$, ***$p < 0.001$.

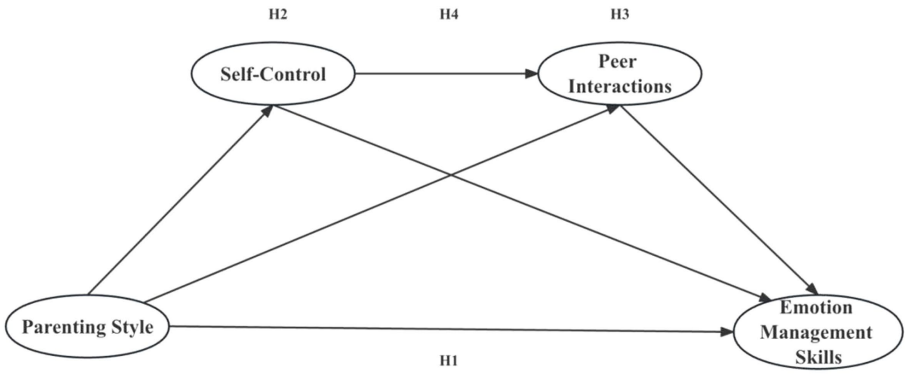

FIGURE 1
The mediating roles of self-control and peer interactions between authoritarian parenting style and emotion management ability. *$p < 0.05$, **$p < 0.01$, ***$p < 0.001$.

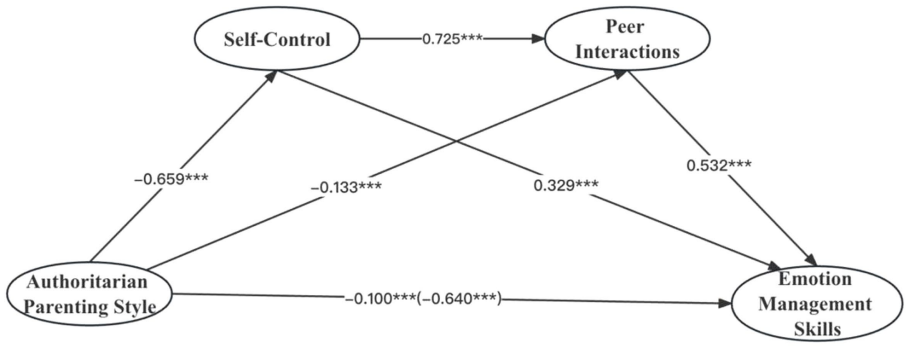

FIGURE 2
Research hypothesis model.

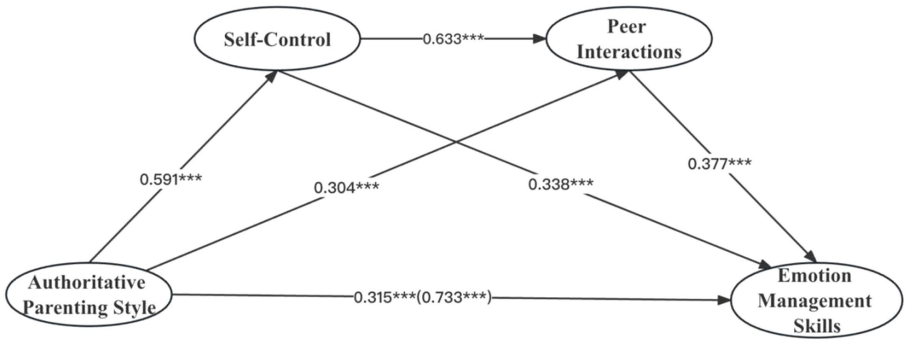

FIGURE 3
The mediating roles of self-control and peer interactions between authoritative parenting style and emotion management ability. *$p < 0.05$, **$p < 0.01$, ***$p < 0.001$.

TABLE 2 Direct, indirect, and total effects of the hypothesized model.

Model pathways	Estimated effect (β)	Boot SE		95% CI	
				Lower	Upper
Direct effect					
Authoritarian parenting style → Emotion management skills	−0.100	0.020		−0.139	−0.062
Indirect effects					
Authoritarian parenting style → Self-control → Emotion management skills	−0.217***	0.018	33.801%	−0.254	−0.183
Authoritarian parenting style → Peer interactions → Emotion management skills	−0.071***	0.010	11.059%	−0.092	−0.051
Authoritarian parenting style → Self-control → Peer interactions → Emotion management skills	−0.254***	0.013	39.564%	−0.280	−0.230
Total effect	−0.641***	0.018		−0.674	−0.604

Authoritarian parenting style as a predictor variable. *$p < 0.05$, **$p < 0.01$, ***$p < 0.001$.

positive direct effect on emotion management skills ($\beta = 0.377$, $t = 14.988$, $p < 0.001$).

Furthermore, as shown in Table 2, the total effect of authoritarian parenting style on emotion management skills was −0.641 (SE = 0.018, 95% CI [−0.674, −0.604], $p < 0.001$) and the direct effect was −0.100 (SE = 0.020, 95% CI [−0.139, −0.062], $p < 0.001$), indicating that both the total effect and the direct effects were statistically significant. The indirect effect was −0.217 (SE = 0.018, 95% CI [−0.254, −0.183], $p < 0.001$) in the pathway of authoritarian parenting style → self-control → emotion management skills, and the mediation effect accounted for 33.801% of the total effect (−0.642). And the indirect effect was −0.071 (SE = 0.010, 95% CI [−0.092, −0.051], $p < 0.001$) in the pathway of authoritarian parenting style → peer interactions → emotion management skills, and the mediation effect accounted for 11.059% of the total effect. Finally, the indirect effect was −0.254(SE = 0.013, 95% CI [−0.280, −0.230], $p < 0.001$) in the pathway of authoritarian parenting style → self-control → peer interactions → emotion management skills, and the mediation effect

TABLE 3 Direct, indirect, and total effects of the hypothesized model.

Model pathways	Estimated effect (β)	Boot SE	Ration	95% CI	
				Lower	Upper
Direct effect					
Authoritative parenting style → Emotion management skills	0.315	0.016		0.282	0.346
Indirect effects					
Authoritative parenting style → Self-control → Emotion management skills	0.200***	0.014	25.940%	0.173	0.230
Authoritative parenting style → Peer interactions → Emotion management skills	0.115***	0.010	14.916%	0.095	0.136
Authoritative parenting style → Self-control → Peer interactions → Emotion management skills	0.141***	0.011	18.288%	0.121	0.163
Total effect	0.770***	0.012		0.747	0.793

Authoritative parenting style as a predictor variable. *$p < 0.05$, **$p < 0.01$, ***$p < 0.001$.

accounted for 39.564% of the total effect. Then, as shown in Table 3, the total effect of authoritative parenting style on emotion management skills was 0.770 (SE = 0.012, 95% CI [0.747, 0.793], $p < 0.001$), and the direct effect was 0.315 (SE = 0.016, 95% CI [0.282, 0.346], $p < 0.001$), indicating that both the total effect and the direct effect were statistically significant. The indirect effect was 0.200 (SE = 0.014, 95% CI [0.173, 0.230], $p < 0.001$) in the pathway of authoritative parenting style → self-control → emotion management skills, and the mediation effect accounted for 25.940% of the total effect (0.771). And the indirect effect was 0.115 (SE = 0.010, 95% CI [0.095, 0.136], $p < 0.001$) in the pathway of authoritative parenting style → peer interactions → emotion management skills, and the mediation effect accounted for 14.916% of the total effect. Finally, the indirect effect was 0.141 (SE = 0.011, 95% CI [0.121, 0. 163], $p < 0.001$) in the pathway of authoritative parenting style → self-control → peer interactions → emotion management skills, and the mediation effect accounted for 18.288% of the total effect. Given that the bootstrapped 95% confidence intervals do not include zero, the statistical significance of these three indirect effects is established. The data analysis revealed that the indirect effect of parenting styles (authoritarian parenting style and authoritative parenting style) on emotion management skills was contingent upon self-control and peer interactions, which served as significant and positive partial mediators in the association between parenting styles (authoritarian parenting style and authoritative parenting style) and emotion management skills.

Discussion

This study aimed to investigate the impact of parenting style on children's emotion management skills, considering the factors of self-control and peer interactions. Our findings validate parental involvement theory (McCurdy and Daro, 2001), bioecological theory (Tudge et al., 2022), and Morris' triple model of early childhood adjustment (Morris et al., 2017), providing support for the notion that self-control mediates the relationship between parenting style and emotion management skills. Furthermore, peer interactions mediate the relationship between negative parenting style and emotion management skills. Additionally, both self-control and peer interactions serve as chain mediators in the association between parenting style and emotion management skills. Finally, the results of this study support Gottman's emotion-based approach to parenting and lay the groundwork for determining whether children express constructive or destructive affective tendencies (Jespersen et al., 2021).

First, this study found a significant relationship between parenting style and children's emotion management skills between the ages of 3–6 (hypothesis one). The evidence confirms that parenting style is the primary factor influencing differences in children's emotion management skills, and that the more authoritative parenting attitudes and behaviors are, the stronger children's emotion management skills have, with a positive association. Whereas authoritarian parenting styles negatively affect children's emotion management skills. The results of this pathway are consistent with previous studies (Tao et al., 2010; Acar et al., 2019; Cantekin and Akduman, 2020; Kashyap et al., 2020). The direct link between parenting style and emotion management skills provides theoretical support for parental involvement theory (Hoover-Dempsey et al., 2005), which states that parents who take an active role tend to listen patiently to their children rather than reprimanding and punishing them, and are more likely to participate in children's activities and guide children's emotional perception, expression, and control either directly or subliminally. In such a family environment, children gain a sense of security, increase their self-confidence and independence, and further improve their emotion management skills balanced by their self-control (Guo Y. et al., 2023). High-quality parent–child interactions result in children feeling supported by their families, accumulating positive energy, being more advantaged in complex social situations, having better self-control, and having positive and optimistic stability (Dinkha et al., 2023; Li et al., 2023).

A longitudinal study of parental behaviors related to children in the United States highlighted warmth and emotionally democratic parenting as determinants of good social and emotional development in children (Garthe et al., 2015). However, according to social learning theory, the more often parents adopt authoritarian parenting attitudes that are less supportive and more intrusive, the more difficult it is for children to regulate their emotions during parent–child interaction tasks (NICHD Early Child Care Research Network, 2004). Children tend to hide their emotions or have variable emotions, intimacy is relatively difficult to establish, and the parent–child bonding is in an unhealthy state of development (Hollenstein and Lewis, 2006; Duncan et al., 2009; Tao et al., 2020). The "helicopter parenting" of a collectivist society produces "good

children who know what they are doing" and "subordinates who do not think for themselves but follow orders (Ho et al., 2022; Hwang et al., 2023). "Helicopter parents" interfere and manipulate their children's thoughts and behavior always, and help them decide everything. In this kind of authoritarian family in China, children are only responsible for studying, working and living according to the path planned by their parents or other adults, so there are a large number of "giant babies" with high scores and low abilities who can only study but not actually live (Zhang et al., 2022). Their emotional changes are completely dependent on their parents' approval, and their emotional stability is brought about by getting used to being planned every step of the way. When they lose the guidance of their parents or teachers, they experience anxiety symptoms of restlessness, worry, confusion, and are in emotional dysregulation and self-doubt (Cui et al., 2019), which seriously affect their physical and mental health (Gao et al., 2023). Based on the above discussion, firstly, in the process of parenting, parents should not only play the role of modeling emotions to improve the quality of parent–child bonding interaction, but also convey positive emotions and emotion management strategies. Secondly, parents should provide guidance and effective communication about children's hidden and variable emotions, and focus on their inadequate emotion management or behavioral withdrawal, as both may be the cause and effect of children's behavioral problems.

Second, this study revealed that self-control mediates the relationship between parenting style and children's emotion management skills, i.e., authoritarian parenting mitigates the negative impact on children's ability to manage their emotions through greater self-control (hypothesis two). This is similar to findings from previous studies (Özdemir et al., 2013; Briki, 2020; Pan et al., 2021). Overall, the internal mechanisms by which parenting style affect children's emotion management skills are consistent. As an extension of previous research, the present study shows that parenting style influence children's emotion management skills through their self-control. This suggests that self-control may be an important factor in protecting against emotional disorders.

During early childhood, the development of self-control is influenced by a range of environmental stressors and supports, shaping its trajectory (Center on the Developing Child at Harvard University, 2011). Individual variations in child self-control have been found to predict outcomes in adulthood, including physical and mental health, criminal behavior, and socioeconomic status (Gagne, 2017). Parenting style plays a significant role in shaping individual differences in self-control among children and adolescents (Gibson et al., 2010; Wang et al., 2016; Li J. B. et al., 2019; Li Y. et al., 2019). On the one hand, with a more stable parent–child relationship, children have a greater sense of integration and trust in the family environment, better control over themselves, and high self-control to better regulate their attentional and behavioral problems so as to display appropriate emotional states (Schmeichel and Baumeister, 2010). Establishing good intimacy between children and parents also promotes mutual emotional contagion and emotional management skills. Therefore, a positive, enthusiastic, and responsive authoritative parenting style can support and promote children's ability to self-regulate, whereas a negative, harsh, and insensitive authoritarian parenting style appears to have detrimental effects (Gajos and Beaver, 2016). On the other hand, when children's emotion management skills are not available from the foundational source of parenting style, the ontological factor of self-control comes into play. Research has shown that people with higher levels of self-management tend to have rational self-perceptions and positive self-initiatives (Vohs et al., 2014). Emotional stability and switching between different emotions require the ego to have a more sensitive sense of perception and a stronger level of control. As a result, children's mastery of self-control will build up their strong willpower from their inner being, promote the development of their good personalities and the successive formation of comprehensive abilities. External emotional management and behavioral dominance will increase in response to more positive evaluations from others, allowing children to integrate more quickly and comfortably into their social or natural environments. At the same time, children's emotional responses and behaviors become more ethical and promote the development of socialization.

Third, the present study also found a mediating effect of peer interactions between parenting style and emotion management skills, where authoritative parenting style could improve children's emotion management skills by influencing their peer interactions. This finding is consistent with national and international research that higher levels of peer interactions are associated with authoritative parenting (Bornstein and Bornstein, 2007; Morris et al., 2021; Lanjekar et al., 2022), suggesting that peer interactions play an important mediating role in the way parenting styles influence children's emotion management skills. Authoritative parenting styles contribute positively to children's peer interactions in a study of the relationship between effortful control and character anger in Chinese children, and that higher peer interactions enhances children's good social adjustment function and cultivates individual pro-sociality and a sense of collective responsibility (Zhou et al., 2004). Well-functioning, well-adjusted families have the capacity to successfully mitigate a wide range of developmental threats to children, while at the same time reducing the likelihood of maladjustment in at-risk groups of children (Azimi et al., 2012).

The most significant difference between peer relationships and parent–child and teacher-student relationships is the "equality" of peer groups, which makes it clear that peer interactions are egalitarian and can be constructed by choice, which helps children express their emotions, transfer information, and learn from each other (Reitz et al., 2014; Leung et al., 2021). In this model, children are more active and willing to accept each other's expressions of opinions and emotions, further developing children's interpersonal skills. Children's current and future cognitive development and social adjustment will be negatively affected if they have problems interacting with their peers (Bosacki, 2015). The present study found that authoritative parenting styles positively predicted children's peer interactions, consistent with previous research (Hong et al., 2021; Marcone et al., 2021). The higher the ability to interact with peers, the better their ability to manage their emotions, which is consistent with Eisenberg's findings (Eisenberg et al., 2001a). Summary of the above, peer interactions play a partial mediating role in the relationship between parenting style and emotion management skills (hypothesis three). First, as children are exposed to a complex and diverse environment, along with the demands of physiological development, they gradually pay attention to external perceptions and imitate the behaviors and emotional expressions of members of that environment, both consciously and

unconsciously. Children with authoritative parents are more emotionally stable, have better peer interactions, have fewer externalizing and implicit problem behaviors, and are more socially adjusted, resulting in higher academic achievement (Kim et al., 2018; Steele and McKinney, 2019). Children who form secure attachments with positive parenting styles are more likely to develop responsive, harmonious peer interactions in kindergarten and elementary school, and these children will have more peer support (Coleman, 2003). Second, children's peer interactions play a mitigating or ameliorating role in the process of the negative effects of authoritarian parenting styles on children's emotion management skills, consistent with ecosystem theory (Bronfenbrenner and Morris, 2007). Children in authoritarian parenting styles tend to have social impairments, more academic problems, exhibit higher levels of negative emotions, and experience both explicit and implicit problem behaviors (Ng-Knight et al., 2016; Kim et al., 2018). They are often unable to develop a healthy emotional management system that is conducive to the development of psychological distress in children. When children face unpleasant situations and obstacles in such negative parenting, peers can re-engage their own emotional perceptions through communication or distraction, and their ability to manage emotions will provide time to consider emotional control, enabling children to choose the final emotion presented and promoting the continued occurrence of positive emotions. Such children who are able to use a constructive approach to managing negative emotions also achieve higher social efficacy, reducing their chances of rejection and exclusion by peers (Eisenberg et al., 2001b) and re-establishing better emotion management skills in peer interactions. Therefore, peer interactions are a highly contextualized imitation and learning process in which external and internal emotions are more likely to be displayed. Children discover themselves and others as emotional individuals, develop unconscious emotional imitation and conscious emotional awareness (Izard et al., 2008), become more aware of their emotional problems, and continue to acquire skills for managing their emotions.

Forth, this study revealed a chain mediating effect, with self-control and peer interactions playing intermediary roles between parenting style and emotion management skills (hypothesis four). These findings support the idea that children with authoritative parenting styles tend to exhibit higher levels of self-control and engage in more positive peer interactions, thereby facilitating the development of their emotion management skills (Chase-Lansdale et al., 1995; Pan et al., 2021; Papadopoulos, 2021). Conversely, children with authoritarian parenting styles tend to have lower levels of self-control and limited peer interactions, impeding the development of their emotion management skills and leading to emotional dysregulation and behavioral problems. These results are consistent with prior research findings (De Minzi, 2007; Gagnon et al., 2014). According to the situational developmental perspective, the family, community, and culture significantly influence children's emotional stability, while their attitudes, judgments, emotional perceptions, and behavioral expressions are highly susceptible to external influences from others' behaviors and group norms (Lamm et al., 2018). Inhibitory control skills are crucial for successful school adjustment, positive peer relationships, and social–emotional functioning (Rueda et al., 2005; Bell and Deater-Deckard, 2007; Crandall et al., 2015). Both inhibitory control and effortful control are important aspects of self-control in children (Scholtes et al., 2021). Given that weaker self-control is associated with lower academic achievement, difficulties in establishing positive peer relationships, and deficits in social–emotional functioning, further research should investigate the ways in which interactive coordination can support healthy developmental outcomes for children (Blair, 2002).

Children who are guided by their parents' positive emotional concepts and emotional behaviors at an early age will develop better self-control. Simultaneously, children who interact with their peers will develop more positive emotions about themselves and others to create happy atmosphere, and such positive emotions will infect the entire peer group from individual to individual, influencing each other emotion management skills for better or worse. Children with high levels of emotion management have better empathy and are able to put themselves in the shoes of their peers, which not only enhances children's observational and analytical skills, but also motivates them to share emotional feelings, speculate on emotion-generating motivations, and improve self-social adaptability, consistent with previous research on similar models (Llorca-Mestre et al., 2017). Overall, this finding extends previous research that has examined the complex relationships among parenting style, self-control, peer interactions, and children's emotion management skills within the framework of Morris' three-model of early childhood adjustment. Authoritative parenting styles help children develop better self-control and become popular in peer interactions, both of which promote children's ability to manage their emotions. Conversely, children in authoritarian parenting styles develop poorer levels of self-control and peer interactions that hinder the development of their emotion management skills. This highlights the need to pay more attention to family education and parenting style choices to improve children's emotional management and mental health, then to shape physically and mentally healthy children through better self-control and peer interactions.

Implications

This study examined the influence of parenting styles on children's emotion management skills from the perspective of self-control and peer interactions, and provided theoretical and practical guidance on how families and schools can actively and rationally promote children's emotion management skills. At the same time, it established a reference direction for parents to choose which parenting styles to implement. Our findings showed that self-control plays an important role in the influence of parenting style on children's emotion management skills. Parents should promote their children's self-control by using parenting behaviors that are high in support and understanding, low in rejection and over-interference. Our findings also indicated that peer interactions play an important role in the influence of parenting style on children's emotion management skills and affect their personality development. Therefore, parents should pay attention not only to the establishment of appropriate self-control but also to the development of their children's peer interactions. Parents need to cultivate their children's self-control and peer interactions through parenting attitudes that are high in emotional warmth, high in supportive acceptance, low in rejection, and low in excessive

control, which, in turn, promote the growth of their children's emotion management skills. Specifically, parents must first be sensitive to children's emotional changes and provide positive emotional experiences to satisfy children's emotional needs and psychological demands. For example, in their relationship with their children, parents are not only listeners but also companions. They need to excel at observing and guiding their children's emotional responses and fostering their awareness of emotion management. When parents listen attentively and provide warmth, acceptance, and emotional support, children will perceive more positive emotional feedback from their caregivers and demonstrate stronger emotional skills (Feng et al., 2021). Second, children will learn and regulate uncomfortable emotions in peer interactions, redirecting emotional attention, reducing both the intensity and maintenance of negative emotions, and maintaining emotional health without stressing the mind and body (Li J. B. et al., 2019; Li Y. et al., 2019). Parents and peers play a crucial role in children's emotional growth and development. Thus, emotional harmony within the family and positive peer relationships are essential for healthy physical and mental development in childhood. This is why early childhood educators should emphasize family education and the cultivation of beneficial peer relationships for children. Ultimately, the combined strengths of the family, preschool, and community create opportunities for children to develop healthy emotion management skills by taking full advantage of multiple environmental resources to learn and experience.

Limitations and future work

The results of the current study should be considered in light of its limitations. First, due to the cross-sectional design of the data, we could not infer causal relationships among the variables. For example, it is not clear that children's lower emotional competence is caused by negative parenting or poor peer interactions, a longitudinal study would be needed to explore these possibilities. Second, we controlled for the age factor of children aged 3–6 years in the study, and all variables were reported using other-rated questionnaires. Although multi-subject reports increase the validity of the data, they lack data on children's self-perceptions, so future studies suggest that researchers can collect data directly from children's responses and performance through play-based tests combined with other-rated questionnaires to improve measurement accuracy. Third, this study only explored the mediating mechanism of parenting style on children's emotion management skills without considering individual differences, and future studies could conduct a more in-depth analysis of the relationship between parenting style and emotion management skills from the perspective of regulation mechanism. Fourth, considering the Chinese cultural context in which parental socialization occurs, we focused on comparing and analyzing the two dominant parenting styles, without considering the permissive style from the three-style model. While we have observed the benefits of the demanding and responsive authoritative parenting styles for children's development, it might be worthwhile to explore the potential advantages of the authoritarian parenting style for children in future research. Fifth, our subjects were selected from China, and culture is also one of the important contextual factors. For example, as a collectivist country, China will show higher collective will and more harmonious consistency (Marginson and Yang, 2020). Therefore, cultural and geographical differences should be considered in the subjects, and the relationship between the variables discussed in the model may be different. Therefore, a larger sample is needed in future studies to build research models that can be generalized to different countries or regions.

Conclusion

The present research investigated the status of emotion management skills among Chinese children aged 3–6 years, while exploring various preceding factors that exert influence on emotion management and emotional stability. Specifically, this study reveals the differential effects of two different types of parenting styles on children's emotion management skills. Furthermore, self-control and peer interactions were identified as a potential mediator in the relationship between parenting style and children's emotion management skills. In addition, this study examined the following mediating pathways: authoritarian parenting style → self-control → peer interactions → emotion management skills and authoritative parenting style → self-control → peer interactions → emotion management skills. As children's levels of self-control and peer interactions increase, the impact of parenting style on children's emotion management skills becomes more pronounced. This study contributes both theoretically and practically. Firstly, it enhances the existing theoretical framework concerning the connection between parenting style and children's emotion management skills, shedding light on the underlying mechanisms by which parenting style impacts the occurrence of children's emotional well-being. Secondly, this study integrates environmental and individual perspectives in the exploration of potential factors that can ameliorate children's emotion management skills, which will provide a more comprehensive picture of the development of emotion management in Chinese children between the ages of 3 and 6 years. Lastly, the results of this study provide practical implications for parents seeking the best parenting style to develop good emotion management skills in children and contribute to family education.

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 the Ethics Committee Review Board of Liaoning Normal University. The studies were conducted in accordance with the local legislation and institutional requirements. The participants provided their written informed consent to participate in this study. 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

DL: writing—original draft, writing—review and editing. WL: conceptualization, methodology, software, formal analysis, writing—original draft, writing—review and editing. XZ: writing—original draft, writing—review and editing. All authors contributed to the article and approved the submitted version.

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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.

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Potential connection between positive frustration in family leisure time and the promotion of adolescent autonomy

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Family relationships during leisure time in adolescence have the potential to promote positive development, particularly in terms of autonomy. However, the scientific literature that links specifically positive family leisure to the development of adolescent autonomy is scarce, and lower when analyzing the role of frustration in leisure time. Grounded in Self-Determination Theory (SDT) this article examines the potential relationship between positive frustration in family leisure time and the promotion of adolescent autonomy. For that purpose, the manuscript addresses four objectives to be discussed consecutively: (1) to delimit the concept of adolescent autonomy and point out the difficulty of parental support; (2) to explore positive frustration, a concept aligned with Csikszentmihalyi's theory of flow, as a construct that can promote socio-emotional development in adolescence; (3) to describe the components of family leisure; and (4) to understand how the experience of optimal frustration may be linked to the development of adolescent autonomy during family leisure time. From this central question, several additional inquiries emerge: the interplay of frustration and failure in adolescence, the importance of parents and adolescents spending quality time together, the enjoyment in structured family leisure time, the autonomy-supportive parenting in leisure time activities in relation to daily activities, the need to strengthen adolescent bonds developed in infancy, and the complexity of paternal and maternal autonomy granting.

KEYWORDS

positive frustration, parental support, family leisure, adolescents, autonomy, coping with stress, structured leisure, motivation

1. Introduction

Research focused on the adolescent population emphasizes a model of positive development, which seeks to identify, understand, and strengthen the factors that increase the capacity of adolescents to maintain and improve their health and wellbeing. While health is understood from the combination of social, physical, and mental domains (World Health Organization [WHO], 2006), the concept of wellbeing broadens its hedonic meaning to eudaimonic (Appelqvist-Schmidlechner et al., 2023; Maurer et al., 2023), in that it emphasizes the potential of the person to engage and fulfill oneself, as well as develop and find meaning in one's life (Ryan and Deci, 2001). Consequently, the approach centered on the vision of a passive adolescent with deficiencies or incapacities who needs protection from risk

behaviors (Lerner et al., 2009), has been overtaken by one that considers the adolescent as an active agent and values his or her potential (Seligman and Csikszentmihalyi, 2000; Gagné and Vansteenkiste, 2013).

There is also broad consensus in the literature in defining adolescence as a relational stage in which context plays a crucial role to develop positively (Caldwell and Faulk, 2013; Shek et al., 2019; Belošević and Ferić, 2022a). Bronfenbrenner's (1979) ecological perspective describes the reciprocal and bidirectional interaction between the different environments in which the individual moves. From a contextual evolutionary paradigm, Lerner's (1992) work on the contextualization of development reinforces the understanding of developmental regulations, shaped by the connection of ecologies within the community and by the reciprocal influences between adolescents and the changing social context. Also noteworthy is Benson's (2006) developmental assets approach, which advocates the alignment between what the subject needs and what is offered from the context, thus distinguishing internal from external assets. Finally, Self-Determination Theory (SDT; Ryan and Deci, 2017, 2020) defines different environments between which a mutually beneficial or positive interaction for development can occur. Other authors have taken a similar approach, presenting different spheres for positive personal development (Arranz-Freijo and Barreto-Zarza, 2022). Of all the environments, the ecology of family experience stands out for its importance.

According to SDT assumed in this paper, the family occupies the most privileged position as an educational and socializing context in the lives of adolescents (Kuczynski and Grusec, 1997), because it has the capacity to promote their progress (Ryan and Deci, 2006) –also in leisure time (Coyl-Shepherd and Hanlon, 2013)– through the family relationships. Parents, as a loving and demanding unit, are called upon to ensure comprehensive development, giving priority in adolescence to the development of autonomy, relationships, and competence (Ryan and Deci, 2000; Grusec and Davidov, 2010).

More specifically, family leisure time has the potential to be the space where parents and adolescents respond together to stressors. From the choice of the activity itself, to the behavior during leisure time, or to the management of emotions, work must be done to make these frustrations positive and in line with the development of adolescent autonomy. For this reason, parents bring two of their external developmental assets into play in leisure time: the establishment of clear behavioral rules –which includes setting family boundaries– and the constructive use of time –which includes time at home– (Shek et al., 2019).

The literature has pointed out that leisure experiences in family dynamics are protective factors against risk behaviors, as well as promoters of health and wellbeing. Although there has been a rapid expansion of studies relating to leisure, it is still necessary to further study how positive frustration –specifically in family leisure– helps adolescents develop their autonomy.

For that purpose, and assuming SDT, this manuscript delimits the concept of adolescent autonomy and points out the difficulty of parental support; it shows positive frustration as a variable that promotes socio-emotional development in adolescence; it offers a theoretical body that justifies that positive frustration within family leisure time can contribute to the development of adolescent autonomy; and it finishes with an extensive discussion and conclusions.

2. Development of adolescent autonomy and autonomy-supportive parenting

Kimmel and Weiner (1998) defined adolescence as a period of transitions from the end of childhood –marked by physical changes– to the onset of adulthood –identified by the ability to cope with new roles–. The concept of adolescence has been approached from various perspectives. While some paradigms have emphasized biological or cultural determinants, others suggest a combination of biopsychosocial or psychosocial factors (Alonso-Stuyck, 2005). In alignment with this paper, the psychosocial perspective views adolescent autonomy as an integral part of the maturation process, crucial for the development of their initial identity. This process occurs during adolescence, marking the transition into the adult world and playing a vital role in promoting adolescent health and wellbeing (Arnett, 2000).

The trajectory of adolescent development is characterized by a prominent pursuit of greater autonomy. From the perspective of SDT, autonomy is conceptualized as adolescents' inclination to independently organize their experiences and behaviors. It involves engaging in activities aligned with an integrated sense of self (Deci and Ryan, 2000), all while recognizing the influence and interdependence of established social connections (Ryan and Deci, 2018). Autonomy, regarded as a defining attribute of adolescents' wellbeing (Avedissian and Alayan, 2021; Bi et al., 2022), encompasses valuational, emotional, cognitive, and behavioral elements that develop at varying rates (Karabanova and Poskrebysheva, 2013). During this phase, individuals aim to form a unique sense of self and identity distinct from parental influences. To construct their identity, adolescents need to establish and organize their abilities, needs, interests, and desires in a manner that allows them to express themselves within a social context. This developmental stage is often described as a "psychosocial moratorium" (Erikson, 1968), where adolescents engage intensely with their environment, treating it as a testing ground for various experiences involving people, objects, or emotions, while temporarily delaying the consequences of their actions.

The process of developing their autonomy inherently intersects with the dynamics of familial interactions and the quality of relationships therein. Consequently, the meaning and significance of adolescent autonomy are profoundly influenced by the quality of these family relationships.

The interrelation between adolescent autonomy and the quality of family relationships constitutes a growing scholarly literature. The examination of the interconnections among adolescents and their parents in the literature is commonly situated within the framework of scrutinizing parental approaches to education and caregiving -parental educational styles vs. parenting practices-. Central to this exploration are the facets of parental warmth and regulatory oversight, both of which hold prominent positions, owing to the foundational role of the family in furnishing adolescents with an environment characterized by affectionate backing, fostering healthy psychological development (Palacios and Rodrigo, 1998). Correspondingly, the dimensions conducive to establishing affirmative emotional bonds during adolescent progression are routinely subjected to examination. Nevertheless, research that comprehensively links educational methodologies

to the dimensions underpinning educational enactments within adolescents (Reparaz et al., 2021), while concurrently shaping the trajectory of their conduct with the intent of steering their emotive evolution, remains less abundant in the literature (Steinberg, 2001).

Parental autonomy support is defined as the parent's active support of the child's capacity to be self-initiating and independent (Ryan and Deci, 2006). Specifically, the study of parental support for adolescent autonomy has traditionally been carried out from two approaches: separation-individuation vs. SDT (Meeus et al., 2005; Mattanah et al., 2011; Kocayörük et al., 2015). There are two other perspectives that complement the previous view. On the one hand, the promotion of independence seeks to help the adolescent to make decisions for him/herself, prioritizing separation from his/her primary group. On the other hand, the promotion of volitional functioning (Benito-Gomez et al., 2020; Francis and Roemhild, 2022) guides adolescents to behave according to their own interests, values, and beliefs (Soenens et al., 2007), appropriating the decisions of close people and supporting themselves with them. While the former perspective seems to be more prevalent in so-called individualistic cultures, the latter is more aligned with the values of collectivist cultures (Fousiani et al., 2014; Marbell-Pierre et al., 2019).

Autonomy-supportive parenting has been characterized from the perspective of family development as a dynamic process of adaptation, a construct that varies over time, in different life situations (Bumpus et al., 2001; Benito-Gomez et al., 2020) and that adapts to cultural issues (Wang et al., 2017). From this framework, three defining dimensions of autonomy, that interact with each other, are mostly cited (Parra et al., 2015). Firstly, "the adolescent's ability to act independently and the possibility of knowing how to take control of his or her own life, having first assimilated the meaning itself" (p. 48), refers to *cognitive autonomy*. The educational challenge for the adolescent is to acquire clearer and realistic awareness about himself/herself. Secondly, "the perception of independence through self-confidence and individuality" deals with *behavioral autonomy*. In this process, parents and children must compromise and negotiate, so that the filial decision is exercised in ever-wider areas. Thirdly, "the establishment of more symmetrical affective bonds than those observed during childhood" (Parra et al., 2015, p. 48) relates to *emotional autonomy*. It allows for a better self-awareness and connection with others.

In practice, parent-child relationships that foster adolescent autonomy are complex due to the maladjustments that characterize adolescence, which hinder the relationship and mutual understanding. Adolescents progressively demand greater personal freedom to form and express their opinions (Smetana et al., 2005), seek to assert themselves in their way of thinking and acting autonomously at a time of particular vulnerability, while maintaining emotional ties with their parents (Van Petegem et al., 2013). Also, they seek to satisfy the need to experience risk and progressively share more time with their friends than with their family. Moreover, there is social pressure on families to overprotect their children from possible dangers (Lukianoff and Haidt, 2018), leading to a flight from an upbringing in risk or adversity (Van Petegem et al., 2020). This exercise of hyper parenting has invasive features of hyper protection (Segrin et al., 2013; Millet, 2021; Schønning Vigdal and Kallesten Brønnick, 2022), which may be driven by the adolescent (Brown et al., 2023). Finally, there may also be internal opposition due to the division of opinion between spouses on what conditions should support or disapprove of this autonomy (Caldwell, 2007).

Thus, the development of adolescent autonomy is a fertile ground for disagreements (Steinberg, 2001). Parental disputes are noted in perceptions of conflict in the family (Mastrotheodoros et al., 2020), in the legitimacy of parental authority (Smetana et al., 2005), in the quality of family communication (De Los Reyes et al., 2016) or in the lack of consensus in the choice of shared experiences (Álvarez-Muñoz et al., 2023). Parents navigate between demanding and responsive to the development of adolescent autonomy (Bornstein, 2019). However, parental control and autonomy-supportive behaviors are not shown to be mutually exclusive (Benito-Gomez et al., 2020): low autonomy does not imply greater behavioral control, nor does the absence of control imply autonomy-granting behavior. To sum up, while adolescents seek the development of their autonomy because it is the major aspect of adolescent psychosocial development which occurs within relationships with parents (Steinberg, 1990), parents are called to implement the situational mechanisms involved in the processes of protection and promotion in the development of adolescent autonomy (Kouros and Garber, 2014; Soenens et al., 2018). They are called upon to strengthen their capacities and to protect them from all that can harm them, both from the context and from their own socio-emotional development and growth (Brooks et al., 2016). They must accommodate their external assets of limit control and constructive use of time to their own adolescent's internal assets, which, in the case of autonomy, are related to five competency areas of their social-emotional development (CASEL, 2017): Self-Awareness, Self-Management, Social Awareness, Relationship Skills, and Responsible Decision-Making.

In essence, the intricate interplay between adolescent autonomy and family relationship quality underscores the significance of recognizing and accommodating the evolving autonomy needs of adolescents within the family structure. In this relationship, parents can help to ensure that experiencing and navigating challenges, setbacks and controlled difficulties fosters the development of autonomy and other essential psychosocial skills during adolescence in ordinary life activities.

3. Positive frustration and autonomy development in adolescents

Positive parenting behavior presents warm affective bonds, as well as a structured environment that encourages stimulation and support, freedom from violence. Parents recognize the value of each individual and also empower them to see themselves as active agents who can positively influence others (Rodrigo et al., 2018). Positive parenting (Council of Europe, 2006) in its well-treatment dimension, focuses on the fact that "the family context must offer the conditions that lead to the crystallization of secure attachment bonds with parents while promoting an adaptive contact with adversity" (Arranz-Freijo and Barreto-Zarza, 2022, p. 69).

Adolescents inevitably experience moderate, everyday stress, a phenomenon not unique to this life stage but present throughout the human lifespan. The challenges and stressors adolescents encounter can originate not only from their peer groups but

also from the family environment (Van Petegem et al., 2020). Precisely, parents constitute a natural psychosocial stressor, defined as stressors arising from interpersonal relationships or social situations and interactions within the environment (Levi, 1972), and to whom limits should be negotiated. Consequently, the disparity between parental viewpoints and those of adolescents, or differences in their criteria in understanding adolescent autonomy, can lead to conflicts and trigger feelings of frustration (Stroud et al., 2009; Sher-Censor et al., 2011; McKay et al., 2021). However, exposure to adversity does not inevitably result in negative outcomes (Brooks et al., 2019). Thus, living together as a family with adolescents can be a daily source of stress, but it can also serve as a catalyst for positive changes that emerge from coping with stressful situations (Sheridan and Carr, 2020).

Frustration is an emotion that most adolescents experience frequently, and it often prompts them to seek information (Wong, 1979). The concept of frustration, a concept not easy to tackle, is a psychological construct with diverse interpretations depending on the psychological paradigms involved. Traditionally, these interpretations can be distilled into two distinct perspectives: one views frustration as an external impediment to an individual's pursuit of a specific goal, while the other regards it as a sense of inadequacy or sorrow stemming from the failure to achieve a desired goal (Amsel, 1958; Antunes Ribeiro, 2020). In these situations, adolescent need frustration refers to the actively frustrated needs which, in turn, contribute to ill-being, psychopathology, and maladaptive functioning (Tóth-Király et al., 2019).

Specifically, adolescents experience frustration when the actions and efforts to meet a goal do not produce the expected results (Graesser and D'Mello, 2012). As San Juan and Murai (2022) point out, "frustration occurs when an individual is obstructed from reaching a goal, which leads to escalated efforts to overcome the obstacle, increasing the emotional response with each try." According to SDT, discomfort arises when the three psychological needs are thwarted, and individuals engage in activities solely to attain rewards or evade punishments. Depending on the intensity of the emotional response, frustration can lead to "aggression, withdrawal, regression, resistance, anger, guilt and remorse, shame, and embarrassment" (Britt and Janus, 1940), making frustration often considered a negative emotion (Maltese et al., 2018).

However, if there is constructive support to help the adolescent work through whatever triggered the frustration, it can become *a source of motivation and curiosity, creating opportunities to move forward*. Each emotion plays a unique role, meaning it provides a response to each situation depending on the factors or elements involved in it. Consequently, emotional factors can influence the development of cognitive resources either positively or negatively. Frustration, as an emotion, when managed appropriately, can provide adolescents with skills to confront situations that challenge our emotional wellbeing (Márquez-Cervantes and Gaeta-González, 2017). Consequently, it can be considered a functional emotion due to its role in aiding adolescents in adaptation. In this scenario, frustration can transform into motivation when the emotional response propels the adolescent to persist in pursuing their goal. Unsatisfied needs create a tension that leads adolescents to an impulse and a search behavior to fulfill the need, thereby reducing the tension and producing satisfaction (García Sanz, 2012). Families, in this context, do not eliminate the arousal; instead, they serve as a stimulus for completing a challenging activity, which increases the adolescent's need to prove themselves and master the challenge.

Within the theoretical framework of Self-Determination Theory (SDT), frustration is acknowledged as potentially hindering individual growth. However, in a collectivist cultural context (Hofstede, 1984) and drawing on the theory of the *zone of proximal development* (Vygotsky, 1978), parental support and boundaries serve as contextual factors in which adolescents develop autonomy. Parental interactions and communication play a crucial role, providing scaffolding and complementing developmental promotion.

Indeed, understanding the dynamics between frustration and need satisfaction is a flourishing topic. Theoretical models, such as Self-Determination Theory, have been developed that focus on these relationships and have been widely researched.

Some authors (Bartholomew et al., 2011; Warburton et al., 2020; Rodrigues et al., 2021) suggest that need frustration (*dark side* of functioning) and need satisfaction (*bright side* of functioning) are distinct but potentially concurrent constructs (Warburton et al., 2020), identifying different subgroups characterized by different combinations of need satisfaction and need frustration. In fact, it is possible for an adolescent to experience both satisfaction and frustration of the three psychological needs within the same environment, as indicated by Bartholomew et al. (2011). Moreover, absence of need satisfaction does not equal the presence of need frustration (Vansteenkiste and Ryan, 2013). Experiences of frustration regarding a need may not be universally maladaptive if they are also accompanied by feelings of satisfaction related to that need. In any case, experiencing need satisfaction without need frustration represents the most adaptive need profile in the domain of sports (Warburton et al., 2020). Chen et al. (2015) investigated whether satisfaction and frustration of the psychological needs for autonomy, relatedness, and competence, as identified within Basic Psychological Need Theory, contributes to participants' wellbeing and ill-being. Their results show that the effects of need satisfaction and need frustration were found to be equivalent across four countries and were not moderated by individual differences in the desire for need satisfaction.

Other authors suggest that frustration and need satisfaction are better represented as a single need fulfilment continuum rather than being two distinct and separate constructs (Bidee et al., 2016; Tóth-Király et al., 2019). From this perspective, Tóth-Király et al. (2019) by relying on the framework of Self-Determination Theory, focused on need satisfaction and need frustration of one's functioning as potential determinants of harmonious passion and obsessive passion across popular screen-based activities. Their findings suggested that general need satisfaction may be a protective factor against the compensatory function of obsessive passion, whereas need frustration may be a potential risk factor.

An adolescent's response to frustration will depend on their expectations regarding the reward associated with achieving the goal. A balance between effort and reward, whether in the form of prizes or emotions linked to accomplishment, will be necessary to elicit positive stimuli through the activity, particularly in overcoming obstacles and successfully meeting challenges. In the absence of addressing their frustration, families can contribute to a decline in motivation or a loss of confidence in their adolescents, both of which can have adverse consequences.

Therefore, frustration is closely intertwined with an adolescent's motivational state. The Theory of Basic Psychological Needs is a theoretical framework largely derived from the SDT (Deci and Ryan, 2000). According to this theory, when these three fundamental psychological needs are met (autonomy, competence, and effectiveness), individuals are more likely to experience intrinsic motivation, enjoy greater psychological wellbeing, and exhibit optimal development. In essence, intrinsic motivation, a cornerstone of the SDT, suggests that cognitive and social development serve as a primary source of enjoyment and vitality throughout an individual's lifespan. However, sustaining and expanding intrinsic motivation requires supportive conditions as it can be easily disrupted by various obstructive contextual factors. Consequently, self-determination facilitated by intrinsic motivation flourishes under conducive circumstances (Ryan and Deci, 2000). According to Ryan and Deci (2000), there is evidence indicating that a foundation of secure and stable relationships is crucial for the expression of intrinsic motivation, with a positive association observed between parent-adolescent relationships and autonomy. On the other hand, frustration of these needs can lead to extrinsic motivation, reduced wellbeing, and adaptation problems. In particular, studies rooted in SDT demonstrated negative effects of need frustration regarding autonomy, competence, and relatedness needs in various contexts such as physical education and voluntary sports (Warburton et al., 2020), classroom education (Cheon et al., 2019), and screen use (Tóth-Király et al., 2019).

On a separate issue, some research suggests that moderate levels of frustration and failure, when approached as learning opportunities, can contribute to the role of frustration and failure in adolescents' resilience and personal growth (Duckworth et al., 2007; Dweck, 2007; Duckworth and Gross, 2014). This perspective emphasizes the importance of helping adolescents build adaptive coping skills. Resilience is the characteristic that allows one to adapt to stressful events healthily and flexibly (Shek et al., 2019) and to experience positive outcomes from adverse situations (Stainton et al., 2019). Parents should foster those developmental assets—internal and external—that support coping and resilience, rooted in their own characteristics (Staempfli, 2007; Vansteenkiste and Ryan, 2013; Tranter et al., 2021), as well as based on an active education that is characterized by sensitivity, cognitive stimulation, and measured intrusiveness with adversity (Volling et al., 2019). This adaptive coping mechanism aligns with the reconceptualization of the concept of active parental monitoring, defined "as a dyadic process that includes parental solicitation, parental control, and emotional autonomy disclosures" (Brown et al., 2023). This active parental monitoring has been associated with positive adolescent adjustment (Dishion and McMahon, 1998).

Precisely, within the theoretical framework of frustration theories, the concept of frustration tolerance emerges, a concept introduced by Rosenzweig (1944). It pertains to an individual's inherent inclination to navigate through experiences of frustration while upholding their psychological adjustment intact. This construct encompasses variations in tolerance to frustration across individuals, intricately intertwined with personal attributes and the intensity of encountered stressors. These complex interactions have implications spanning the cognitive and affective domains. Frustration tolerance functions as a metric measuring an individual's capacity to adapt within their surroundings.

In short, optimal frustration can be considered a necessary complement to successful parenting practice in establishing secure attachments (Arranz-Freijo and Barreto-Zarza, 2022), which accompanies external developmental assets. Specifically, Kohut (1971) delineated the concept of optimal frustration within the psychoanalytic framework as manageable disappointments occurring within the early mother-child relationship. These disappointments facilitate the formation of internal structures, laying the groundwork for self-regulation, and they hold relevance for the subsequent developmental trajectory of the child.

Csikszentmihalyi (2008) also introduced this concept and the search for enriching and rewarding experiences from his *flow theory*. A state of flow is experienced when a balance between skill and difficulty is achieved in a challenging activity. Thus, a high degree of concentration, enjoyment, and satisfaction is experienced. Optimal frustration is an essential element in achieving and maintaining this flow state because it provides challenges that stimulate skill development and self-improvement, which, in turn, promotes learning and self-regulation (see **Figure 1**).

Arranz-Freijo and Barreto-Zarza (2022) have further defined optimal frustration as "the experience, on the part of boys and girls, of adequately timed, dosed, and never traumatic frustrations, which offer attainable challenges that activate the construction of adaptive and successful responses to their environment" (p. 69). The construct of "optimal frustration," as proposed by Arranz-Freijo and Barreto-Zarza (2022), is situated in the context of childhood and adolescent education within the family environment. In this educational context, parents establish clear boundaries for their children, avoiding overprotection, which is generally associated with negative educational outcomes, and instead, they promote autonomy.

Therefore, and from SDT perspective, optimal frustration can be considered a promoter variable of socioemotional development in adolescence, present in the exercise of fostering resilience and tolerance against adversity. Frustration is not the same as failure, in the sense of a possible outcome of the activity when the goal has not been met.

To sum up, It is suggested that optimal frustration can serve as a potent motivator when recontextualized as a constructive experience that offers valuable learning opportunities. In certain contexts, it may even carry positive implications. Nevertheless, our comprehension of the extent to which frustration contributes to positive experiences remains limited (San Juan and Murai, 2022).

Moving on to other issues, assessing frustration poses a multifaceted challenge. Typically, its evaluation entails the analysis of various variables linked to cognitive-affective responses, encompassing physiological reactions and self-reports. Published studies frequently establish connections between frustration and achievement within the context of learning activities (Cheon et al., 2019: San Juan and Murai, 2022) or in support groups (Sims and Gaugler, 2018; Baucom et al., 2019). These investigations explore how frustration relates to motivation or investment (Bevan et al., 2015), its associations with obstacles (Chou, 2018; Bartlett and Abrams, 2019), and its correlations with difficulties (Cohen, 2022), errors, and discontinuation (Hughes and Morrison, 2018). It is noteworthy that only a limited number of studies explicitly aim to measure frustration.

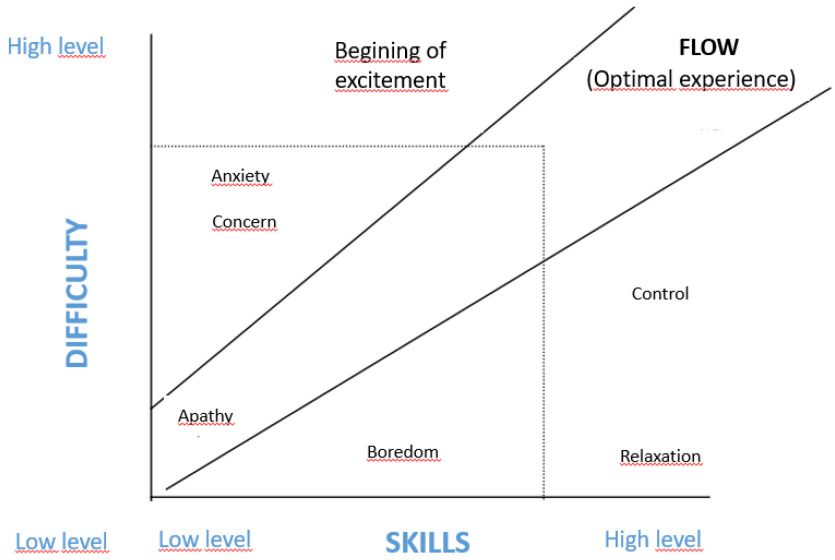

FIGURE 1
Flow experience adapted from Csikszentmihalyi (Alonso-Stuyck, 2005, p. 102).

References in the literature can be found regarding the measurement of challenges rather than frustrations, particularly focusing on effective quality, cognitive activation, and perceptions of achievement (Csikszentmihalyi and Larson, 1987). Additionally, there exists a scale for assessing optimal experiences based on factors such as challenge-skill balance, action-awareness merging, clear goal setting, unambiguous feedback, concentration on the task at hand, a sense of control, loss of self-consciousness, transformation of time, and autotelic experiences (Jackson and Marsh, 1996).

Indeed, there is a substantial body of literature that explores the measurement of brain activation in the context of need frustration (Thetford, 1952; Bierzynska et al., 2016; Ihme et al., 2018), with particular attention to the physiological systems activated in response to perceived stress. Different tools are utilized to experimentally induce stress in adolescents, with the goal of examining their response patterns. These tools include the *Trier Social Stress Test* (TSST) (Allen et al., 2017) and the *Frustration Stress Scale for Adolescents* (FSS-A) (McKay et al., 2021). According to the authors, the FSS-A is an interpersonal psychosocial stress protocol specifically designed for adolescents. Its purpose is to induce moderate frustration in a laboratory setting, achieved through a peer-debate on a value-laden topic identified as potentially frustrating, followed by a serial-subtraction task. The FSS-A protocol spans 90 min, encompassing three phases: Anticipation (involving data collection, personal relevance and frustration rating on value-laden issues, and 5 min for debate preparation); Test (where participants engage in a "judged" 5-min debate followed by an oral subtraction task); and Recovery (involving debriefing and questionnaire completion).

Furthermore, subjective stress levels in adolescents can be assessed using tools such as the *Subjective Stress Scale* (SSS) (Cameron et al., 2017) and the *Perceived Stress Scale* (PSS) (Lakey and Heller, 1988). To measure anger and frustration, researchers often employ the *State-Trait Anger Expression Inventory-2* (Spielberger, 1999). Additionally, *Basic Psychological Need Satisfaction and Frustration Scale* (BPNSFS) *can be used* (Chen et al., 2015; Kuźma et al., 2020). However, it does not fully validate the concept of optimal frustration. The experience of optimal frustration involves a cognitive and emotional complexity that can be challenging to measure accurately.

In the context of autonomy development in adolescents, experiencing positive frustration is thought to be crucial. In any case, the relationship between positive frustration and autonomy development is complex and multifaceted. While some level of challenge is beneficial, excessive frustration without appropriate support can lead to negative outcomes. Therefore, it's crucial for parents to create an environment where adolescents are provided with opportunities for positive frustration while also receiving guidance, encouragement, and resources to help them navigate challenges effectively.

Family time shared between parents and children, such as leisure time, can be used to develop adolescent autonomy (Joussemet et al., 2008; Lee et al., 2012; Denovan and Macaskill, 2017; Rodríguez-Meirinhos et al., 2020) while achieving this state of flow and creating the environmental conditions that favor the promotion of wellbeing (Iwasaki et al., 2005; Ross et al., 2020; Avedissian and Alayan, 2021). Both parents may manage it differently (Paquette, 2004; Vrolijk et al., 2020), or their competence may be distinctively perceived. Thus, while mothers' emotional support may be interpreted as a threat to the development of adolescent autonomy, fathers' emotional support may be understood as autonomy-promoting (Brown et al., 2023). Similarly, perceptions of maternal and paternal promotion of volitional functioning as autonomy granting were significantly negatively associated with both anxiety and depression, whereas promotion of independence as autonomy granting was significantly associated with only anxiety (and not depression) for only perceptions of maternal (and not paternal) parenting (Francis and Roemhild, 2022).

Different meanings are distinguished in the process of coping and adaptation in leisure time: (1) a positive distraction (Waugh et al., 2020), (2) an opportunity to maintain optimism and hope (Liu et al., 2023), (3) a source of normality (Kono, 2015), and (4) a context for positive internal change (Iwasaki et al., 2006). The second and third meanings are mostly studied in vulnerable populations (Hayosh, 2017), while the first and fourth meanings have a more generalized population approach.

Beyond participation, frequency, or type of leisure activities, experiencing positive frustration in family leisure activities should be explored as a mechanism to develop adolescent autonomy.

4. Family leisure and adolescent autonomy development

While family leisure research has gained prominence in recent decades, particularly in the European context (Badura et al., 2021), its roots extend back in time. In the 1970s, a pivotal transformation occurred in the field of leisure studies, as researchers began to adopt a psychological perspective to explore personality development. This transformative approach, pioneered by Neulinger (1974), primarily focused on assessing personality within the ideal and valuable context of leisure activities. considering five key dimensions: perceived freedom, intrinsic motivation, extrinsic motivation, end goal, and instrumental goal. Notably, intrinsic motivation was closely associated with classical leisure, where individuals engaged in activities purely for the sake of enjoyment.

Neulinger's (1981) work emphasized the necessity of promoting leisure as a pathway to human self-realization. He argued for the development of positive attitudes toward leisure, both in and outside of the workplace, with the ultimate goal of creating an environment where the value of leisure equaled that of work. Notably, Neulinger viewed work not as an isolated concept but as interconnected with leisure, laying the groundwork for subsequent research in this area. Building upon Neulinger's pioneering work, Iso-Ahola (1980) published the first textbook on the subject, highlighting the significance of perceived freedom and intrinsic motivation as fundamental conditions for individuals to truly experience leisure.

As previously stated, Csikszentmihalyi's (1975, 1996) influential concept of "flow" or optimal experience that occurs when individuals strike a harmonious balance between the challenge of an activity and their skill level, underscored the integration of all facets of life, emphasizing the importance of creatively filling leisure time and finding joy in all endeavors, whether classified as work or leisure. In terms of personal development, Csikszentmihalyi (2001) stressed that individuals must enhance their psychological complexity during both leisure and obligatory tasks to fully benefit from optimal development.

Tinsley and Tinsley (1986) proposed a holistic model for examining leisure, shifting the focus from the activities themselves to the subjective experiences of individuals. This novel psychological approach aimed to capture and categorize how individuals perceive leisure, considering it as an experience influenced by specific conditions and endowed with distinct qualities and benefits. Furthermore, they argued that work-related attitudes could potentially satisfy the seven attributes of leisure, originating from subjective experiences such as concentration, self-forgetfulness, and diminished awareness of time, as well as affective experiences including a sense of freedom, enriched perception of objects and events, heightened emotional intensity, and heightened bodily sensitivity to emotions. Four additional characteristics could also be integrated: freedom of choice, intrinsic satisfaction, provision of optimal stimulation, and a sense of commitment.

Several integrative reviews (Hawks, 1991; Hodge et al., 2015) have synthesized the three themes that family leisure addresses: the promotion of family wellbeing through leisure –where this study is framed–, the costs and constraints of family leisure, and family leisure in marginalized environments.

Leisure is commonly defined as activities undertaken during one's free time for pleasure and personal choice (Bradley and Inglis, 2012), and it is a source of personal and social growth and development (Alonso et al., 2019). This concept encompasses both an objective perspective, focusing on the activities themselves, the environments in which they occur, and the time periods allocated to them, and a subjective perspective, concerned with the meanings, experiences, and personal needs that these activities fulfill (Codina and Freire, 2020). Measuring leisure involves two distinct approaches: the researcher's analysis of activity records and the participant's experiential assessment, which considers aspects like satisfaction and associated meaning (Codina and Freire, 2020).

However, the concept of positive leisure transcends these definitions. It occurs within the context of non-formal education, promoting rest, enjoyment, and the development of social bonds (Da Costa et al., 2020). This form of leisure encourages slow, stable, and sustainable maturation processes that imbue life with meaning (Melton, 2017; Townsend et al., 2017; Kang et al., 2019; Melton and Ellis, 2019). It distinguishes itself from the consumption of experiences characterized by intense, fleeting emotions (Caride, 2012). Adolescents find positive leisure an avenue to fulfill their developmental need for enriching experiences (Caldwell and Weybright, 2018; Rodriguez-Bravo et al., 2020) while simultaneously deterring risky behaviors (Xie et al., 2019).

Moreover, positive family leisure serves as a resource for learning and honing social skills, particularly focusing on strategies for emotional management among adolescents and parents. The concept of family experience ecologies outlines the conditions necessary for achieving this goal (Melton, 2017).

In summary, adolescent family leisure activities can play a pivotal role in personal, social, and emotional development. They can provide opportunities for skill-building, autonomy development, and the maintenance of healthy family bonds, all of which are crucial for adolescents as they navigate the path to adulthood. Nevertheless, it is essential that certain conditions within the family are in place to enable the realization of these benefits during leisure. This involves a thorough consideration of the familial relational and emotional components, alongside communicative aspects.

4.1. Relational and emotional component of family leisure

Neither all leisure is equal (Melton et al., 2022) nor is it necessarily a positive experience for the adolescent,

because it can be associated with anxiety, stress, loneliness, isolation, and boredom. What sets apart leisure activities with educational benefits for adolescents is the development of emotional competencies and relationships that it facilitates.

There are several leisure activities that adolescents can do with their families, depending on different elements. Firstly, leisure activities may vary the social interaction that they demand, i.e., there are leisure activities in which there is contact with others and those that are autonomous in nature. Secondly, supervision in leisure time can be different. For example, solitary leisure – listening to music or reading–, leisure with the presence of peers (Veenstra et al., 2010), and supervised leisure by adults or peers (Metzger et al., 2009). Thirdly, the amount of effort required in the activity can vary. Thus, active, relaxed, passive, or sedentary leisure can be distinguished (Bradley and Inglis, 2012). Finally, they may differ in their approach. Among the most practised family leisure activities with adolescents are sports, cultural, therapeutic, digital, and naturalistic leisure (Álvarez Muñoz and Hernández Prados, 2023).

However, negotiation and management in leisure time, regardless of the chosen activities, present a similar pattern of parental behavior: the need to negotiate rules, to increase task-focused interactions, and to decrease fragmented interactions in order to achieve higher-quality family leisure (Schwab and Dustin, 2015). Adolescents spend most of their waking time in academic activities or in leisure and free time, both of which are important for the development of qualities such as autonomy or self-control (Caldwell and Smith, 2006; Xie et al., 2017). The predilection for individual leisure activities over family activities increases due to the need for independence that characterizes the adolescent population (Lee et al., 2012). This is probably why the planning and organization of leisure time between parents and adolescents has been overlooked (Marshall et al., 2014).

What is learned within the family context can be extrapolated to others (Melton, 2017). Conflict resolution patterns between adolescents and parents can influence the approaches of the former to resolve conflicts with peers (Van Doorn et al., 2011). Shared leisure and free time between parents and adolescents can be a vital component of family life in which individuals build identity and engage in activities considered "doing family" (Daly, 2001; Shannon, 2022). It has been linked to a higher quality of life (Jenq and Chen, 2021) and higher levels of satisfaction (Agate et al., 2009; Melton and Zabriskie, 2016; Parker et al., 2022), especially among parents (Zabriskie and McCormick, 2003), particularly when fathers are involved (Buswell et al., 2012). However, there is limited literature exploring the development of autonomy within parent-child relationships during leisure time (Larson et al., 2007; Marshall et al., 2014; Van der Eecken et al., 2018; Xie et al., 2019).

Family leisure can be the ideal place to promote positive behavioral and emotional regulation (Da Costa et al., 2020; Álvarez Muñoz and Hernández Prados, 2022), as well as a positive development of adolescents, particularly if there is parental acceptance. When experiencing adverse situations, parents can teach how to cope with them and turn them into opportunities, to favor the learning of values that promote tolerance to frustration and resilience development (Denovan and Macaskill, 2017). If the context, through appropriate frustration, presents engagement, control, and challenge, the adolescents can gain internal control, psychological resilience (Bartko and Eccles, 2003), and thereby improve their sense of autonomy (Maddi, 2013).

Likewise, shared leisure time provides the context in which the family as a primary group can carry out a generational transfer, by sharing behavioral norms with its members and by establishing a value system that enables the basic physical, social, and psychological conditions for adjustment (Bradley and Inglis, 2012; Vukik, 2019). The optimal frustration context creates the condition to protect from negative behaviors or to promote healthy positive development (Caldwell and Faulk, 2013), with parents as role models in their chosen activities (Huebner and Mancini, 2003). Some authors point out that family leisure activities protect from risky behaviors, such as problematic mobile phone use (Albertos and Ibabe, 2021) or alcohol consumption (Albertos et al., 2021), and are associated with engaging in other positive leisure activities with peers (Badura et al., 2017).

In summary, shared family leisure time offers an opportunity to support the holistic development of adolescents (Bradley and Inglis, 2012), fostering communication, socialization, and the transmission of shared values, all while enhancing family cohesion.

4.2. Communicative aspects of family leisure in adolescent autonomy development

Parents can influence the development of autonomy in their children during leisure time through their communicative interactions, either by hindering or promoting it. This being so, parent-child relationships based on dialog and negotiation, emphasizing the external or behavioral aspect (Alonso-Stuyck, 2005), are key to adolescent autonomy development. From the establishment of positive emotional autonomy, adequate behavioral autonomy is derived. Consequently, a suitable distance between dependence and independence in parents is needed in relationships allowing the psychosocial maturity of the adolescent.

For the adolescent, shared leisure experiences can help them to develop self-awareness (to become aware of their reactions, bodily sensations, thoughts, beliefs, attitudes, attributions, values, behavior) and to understand how their behavior influences others (Carden et al., 2021). Therefore, cognitive autonomy is specially promoted.

Time spent on family leisure will depend on the climate that is generated, in terms of family cohesion, flexibility, and communication (Ponce de León-Elizondo et al., 2015; Hodge et al., 2018). Communicating different points of view during leisure time opens the door to parental knowledge, through the adolescent's disclosure (Kerr and Stattin, 2000; Jiménez-Iglesias et al., 2013). Positive family leisure time exhibits the three conditions that define a growth-promoting climate: congruence, empathy, and unconditional positive regard. In leisure time, parent-child relationships must foster adolescent autonomy, characterized by combining affection but also respectful support adolescent's individuality. The discrepancy between parents' criteria and children's opinions about leisure time can create a necessary confrontation but is prescribed for the acquisition of personal judgment as long as the stressful atmosphere is right. The literature has differentiated several ways of coping with stress in adolescents:

problem-focused coping and emotion-focused coping. While in the former, stress is reduced by problem-solving, the latter is reduced by distancing. Adolescents approach stress using both approaches (Lee et al., 2012).

To add to this, shared family leisure must create a psychologically safe atmosphere (Duran, 2017; Caldwell and Witt, 2018), in which one's emotions can be unambiguous, authentic, and henceforth a context that allows one to show one's own vulnerability. Such vulnerability helps to create bonds with others who are equally vulnerable and who are the first to respect each other's intrinsic worth (Maurer et al., 2023). Therefore, shared leisure time in which there is assertive communication (Robles et al., 2021) can help parents to be more aware of and attuned to the needs of their adolescent children (Sharp et al., 2006), fostering most notably the promotion of behavioral and emotional autonomy. A favorable communicative environment invites more time together, which can be associated with greater bonding and guaranteed family encounters (Hodge et al., 2017, 2022; Hart et al., 2020; Shannon, 2022), as well as greater protection from adolescent risk behaviors (Albertos et al., 2016) and greater likelihood of adequate parenting skills (Martín Quintana et al., 2018; Van der Eecken et al., 2018).

The challenge at this stage is for the adolescent to become both autonomous and, at the same time, linked to his/her family (Oliva and Parra, 2001). Therefore, manifestations of internal security and self-regulation will be a sign that it is developing positively.

4.3. Frustration in family leisure activities and development of adolescent autonomy

It has been mentioned that optimal frustration can represent an opportunity for the emotional development of adolescents during family leisure time. The literature has traditionally categorized leisure activities based on their structure, and it has linked them to the development of autonomy in adolescents (Van der Eecken et al., 2018).

Unstructured activities lack adult supervision and typically take place in public spaces, without a specific skill development objective, but rather emphasizing socialization (Ibabe et al., 2023). Some of the most commonly practised family leisure activities fall into this category, such as gastronomic leisure, digital leisure, and commercial leisure (Álvarez Muñoz and Hernández Prados, 2023). However, these activities receive comparatively less attention in the literature (Marshall et al., 2014).

Research has linked non-structured activities to risk factors in adolescents, including alcohol and substance use (Prieto-Damm et al., 2019), lower academic performance (Badura et al., 2018), deficient inhibitory control goals and skills, and problematic screen use (Ibabe et al., 2023). While some argue that at the very least, non-structured activities do not contribute positively to development (Caldwell, 2008), the effective management of positive frustration in unstructured activities appears to be a more complex challenge for parents.

In contrast, structured leisure activities possess several defining characteristics, including organization, adult supervision, and a focus on skill enhancement (Eccles and Gootman, 2002; Roth and Brooks-Gunn, 2003; Barker et al., 2014). These activities are carefully planned and supervised by adults, providing adolescents with opportunities for learning, skill development, and engaging in meaningful experiences during their free time. This concept aligns with the notion of purposive leisure, emphasizing goal orientation, the promotion of family cohesion, communication, moral values, and the cultivation of healthy lifestyle traits (Shaw and Dawson, 2001).

Family leisure time is the ideal context for the development of autonomy, competence, and relatedness, as long as it is linked to the intrinsic motivation of the adolescent (Larson, 2000; Oropesa, 2014). When these linked actions are present, such as those practiced in family leisure time in a structured and lasting way, they are transformed into joint projects (Young et al., 2001). The concept of "optimal frustration and coping" is particularly relevant in the selection of structured leisure activities, especially during adolescence, which can be a complex stage for negotiating and managing such activities (Marshall et al., 2014). Although parents and children are involved in selecting these activities (Huebner and Mancini, 2003), it is primarily the responsibility of parents to attend to their adolescents' intrinsic motivation and to make choices in shared activities based on these motivations rather than solely focusing on the structure of the activity itself (Caldwell and Faulk, 2013). Ahmadi et al. (2023) created a classification of 57 teacher behaviors consistent with Self-Determination Theory. They informed that teachers, like parents, could promote autonomy in their adolescent students by providing them with choices instead of giving commands and by providing explanations rather than arbitrary instructions. One's engagement and involvement can vary as a function of passion for these activities (Tóth-Király et al., 2019). Therefore, parents must be aware of the motivational factors driving adolescents' participation in leisure activities (Kim et al., 2019; Belošević and Ferić, 2022b) and adjust their expectations by planning activities that align with adolescents' interests and capabilities (Metzger et al., 2009), such as kinetic activities (Lee et al., 2012), passive leisure (Lee et al., 2017), or home-based digital leisure (López-Sintas et al., 2017). In fact, adolescents with encouraging parents tend to participate more in both organized and unorganized leisure activities (Van der Eecken et al., 2018).

Additionally, the family atmosphere must be conducive to the activities that connect with adolescents' interests, as adolescents' attitudes, subjective norms, and perceived behavioral control significantly influence their intention to participate in active family leisure (Taylor et al., 2012; Sanz et al., 2018). When adolescents actively participate in pleasurable leisure activities and are satisfied with them, psychological needs can be fulfilled due to parental monitoring and participation. In fact, tendencies of boredom and Internet addiction behavior can be reduced with encouragement to participate in family and outdoor activities (Lin et al., 2009). Specifically, parental autonomy-granting is generally associated with lower levels of parental encouragement (Van der Eecken et al., 2018). As Valdemoros et al. (2014) mentioned, factors related to internal family functioning are true determinants in the construction of youth physical-sport leisure. In particular, different strategies to promote physical activity among adolescents have been identified, such as increasing levels of family cohesion, parental engagement, parent-child communication, and adolescent self-esteem (Ornelas et al., 2007).

Parents can hinder the development of autonomy during leisure time by creating an environment in which adolescents perceive themselves as overly reliant and dependent on them for support, which is developmentally inappropriate (Steinberg and Silk, 2002). Excessive *amounts of support*, which is one of the two types of parenting practice in leisure time (Xie et al., 2019), does not align with the adolescent's developmental needs and can hinder his/her perception of parental autonomy support. If parental monitoring in adolescence is generally protective, excessive or harsh monitoring can become intrusive and inhibit psychosocial development (Barber et al., 2005). At its core, what parents are communicating is that the adolescent lacks self-control competence and therefore needs protection (Schønning Vigdal and Kallesten Brønnick, 2022). In this sense, parenting behaviors which are too directive or restrictive with children's autonomy are associated with lower levels of child physical activity (Jackson et al., 1998; Simons-Morton and Hartos, 2002). Similarly, in an analysis context of parental leisure involvement and its relation to substance use, it is noted that parental leisure overcontrol had a stronger positive relationship with leisure boredom for males than for females (Xie et al., 2019). Ultimately, abundant literature on parenting has positioned itself in a line that suggests that the most beneficial parental behavior for adolescent autonomy development is at a moderate level of control (Karabanova and Poskrebysheva, 2013).

However, psychological control and autonomy granting has to be considered different constructs and not opposite ends of a continuum (Silk et al., 2003), although interrelated (Hauser Kunz and Grych, 2013). Particularly, parental psychological control and autonomy granting exhibited some shared and some unique correlates with indices of child and family functioning. Hierarchical regressions revealed significant interactions between these dimensions, suggesting that the strength of some associations between parents' use of psychological control and youth adjustment problems depends on the level of autonomy granted exhibited by the parent (Hauser Kunz and Grych, 2013).

Parental involvement is known as the second type of parenting practice in leisure time (Xie et al., 2019). Parental monitoring regarding optimal frustration must balance parental responsiveness with parental demandingness, knowing how to distinguish between dependency-oriented and achievement-oriented control (Soenens et al., 2010). Adolescents who perceive their parents as more psychologically and behaviorally controlling report greater psychological distress and less psychological wellbeing (García Mendoza et al., 2019). However, some studies point out these results with this line (Brown et al., 2023). Thus, high levels of some digital interactions between parents and emerging adolescents are potentially perceived as unsupportive of their autonomy. Specifically, greater provision of advice by mothers and greater control by fathers via text messages is interpreted by adolescents as less favorable for their autonomy (Brown et al., 2023). In the same way, adolescents with parents who combine encouragement with autonomy-granting do not necessarily engage more in organized and unorganized leisure activities (Van der Eecken et al., 2018).

Participation in leisure time can provide an opportunity to build positive relationships with others, develop communication and problem-solving skills, and experience a sense of achievement and competence. To do this, parents need to mediate the activity and the context. They must present emotional and motivational support and resources to maintain appropriate involvement, interest, and participation, which involves managing frustration well. Specifically, they can promote the relationship by recognizing and accepting negative emotions instead of punishing them and by showing interest (Ahmadi et al., 2023), they might support competence by providing specific, informative feedback and clear goals. This time must be goal-oriented and/or creative and expressive; it requires discipline and focused attention; it must offer challenges to overcome; it must involve cooperation and interaction with others; it must develop skills and increase competence; and it requires persistence, commitment, and continuity of participation over time (Caldwell, 2008). Knowledge of your adolescent's coping with stress will help to manage frustration in a positive way. Thus, an active/accommodating coping goal orientation in adolescents will predict participation in structured leisure activities, including shared family time (Hutchinson et al., 2006).

5. Discussion

This paper article aims to investigate the relationship between the experience of frustration within the family leisure context and the development of autonomy in adolescents. The central research question focuses on understanding how the experience of optimal frustration may be linked to the development of adolescent autonomy during family leisure time. From this central question, several additional inquiries emerge.

5.1. Frustration and failure interplay in adolescence

First and foremost, this document introduces the *intricate interplay between frustration and failure in adolescents.* Frustration and failure frequently intertwine within the experiences of adolescents. When adolescents confront challenges or setbacks in their pursuit of objectives or fulfillment of needs, frustration naturally arises (Warburton et al., 2020; Rodrigues et al., 2021). Moreover, recurrent failures, particularly in domains significant to adolescents, such as academics, sports, or interpersonal relationships, can intensify feelings of frustration. If not effectively managed, this frustration can exert an adverse impact on their psychological wellbeing. Additionally, frustration stemming from failure can significantly influence adolescents' motivation. Moreover, recent studies have evidenced that parental autonomy granting is linked to adolescents' life satisfaction. It possesses the capacity to either stimulate perseverance and improvement or induce feelings of hopelessness and diminished motivation. Furthermore, adolescents' perceptions and responses to frustration and failure are subject to developmental variation. Adolescents are in the process of honing their emotional regulation and coping abilities, which consequently affect how they navigate these experiences.

The focus of this association revolves around the potential negative consequences of an activity when the desired goal remains unattained. It is imperative to underscore that the *essence of this connection does not revolve around conflating frustration with a negation of the need for autonomy or discomfort—need satisfaction* – . In other words, and according to different authors (Warburton et al., 2020), the need for frustration and the need for satisfaction are distinct. Instead, it centers on the importance of refraining from

equating frustration with autonomy-related concerns, sentiments of coercion and pressure, frustration related to competence and failure, or frustration linked to interpersonal relationships and sentiments of isolation (Rodríguez-Meirinhos et al., 2019, 2020). It is evident, therefore, that the existence of possible optimal frustration is not considered, as suggested in this paper, but rather a frustration in a negative sense and measured as denial of needs, thereby overlooking a potentially positive aspect or, at best, mentioning its positive aspect without delving into further discussion. However, according to the literature, moderate levels of frustration and failure, when perceived as opportunities for learning, can contribute to adolescents' resilience and personal growth. This perspective underscores the significance of assisting adolescents in cultivating adaptive coping skills.

5.2. Adolescent autonomy and optimal frustration from SDT

Related to the previous issue, this paper also evidences the need to *adopt a specific perspective for considering adolescent autonomy in relation to frustration and frame it within a specific stance*. In this case, a notion of autonomy based on the perspective of Self-Determination Theory has been contemplated, wherein social connections and interdependence with others are upheld. The choice is to scrutinize a concept of autonomy where independence from others is sought in an interconnected manner within the system to which the adolescent belongs. Consequently, autonomy is not conceived merely as independence from others or in an isolated manner.

Precisely, as autonomy is an integral part of their maturation process and is pivotal for their identity formation—entailing a desire to achieve independence from others and to orchestrate their own experiences and behaviors (Ryan and Deci, 2000)—it is equally critical to sustain social connections and interdependence with others. Hence, it becomes pertinent to analyze the concept of optimal frustration *from the perspective of the promotion of volitional functioning* (Benito-Gomez et al., 2020; Francis and Roemhild, 2022). As previously mentioned, this standpoint encourages adolescents to act following their own interests, values, and beliefs (Soenens et al., 2007), while also embracing the decisions of close individuals and seeking support from them. Furthermore, it should be noted that according to Soenens et al. (2018), in the context of autonomy as volition, parental promotion of volitional functioning, which includes providing help and advice, is not contradictory to parental norm-setting. Norm-setting involves clear communication of rules, offering meaningful justifications for these rules, and considering the adolescent's perspective. These authors argue that the introduction of autonomy-supportive norms is effective not only in moral aspects but also in personal domains like friendships. This idea emphasizes that parents can support autonomy while also setting and explaining rules, which can be beneficial for adolescents' development, including their interpersonal relationships.

Likewise, the consideration of optimal frustration is more congruent *with the values of so-called collectivist cultures* rather than individualistic ones (Fousiani et al., 2014; Marbell-Pierre et al., 2019). Individualistic cultures might place more emphasis on personal autonomy understood as independence from others and minimizing frustration or obstacles in the pursuit of individual goals and happiness. Conversely, in collectivist cultures, there may be a greater emphasis on resilience and personal growth through facing challenges, as this growth can benefit the larger social group or family.

5.3. Biopsychosocial approach for measuring frustration

Another issue related to the above is that frustration, as a multifaceted concept, refers to different facets (biopsychosocial), making its global measurement complex. It is necessary to have several valid and reliable instruments to address the measurement of any construct. In this regard, the choice of the instrument will depend on the measurement objectives and the context of the research or evaluation. The theme of frustration is known and studied through various instruments. It is agreed that the experience of frustration generates some type of reaction in adolescents, but this reaction is typically associated with a negative meaning. Thus, it is possible to measure the bodily alterations resulting from experiencing frustration, or the psychological processes that directly impact responses to frustration, such as temperament, emotional responses, resources, and efforts to confront and manage stress (Rosenzweig, 1968). Similarly, it is possible to approach measurements of the social aspect, which refers to family backgrounds, parental responses to the child's frustration, or stressful events in the social and family environment. Consequently, a biopsychosocial approach is needed to embrace the construct. However, the choice of the instrument also depends on the definition of that construct. The experience of optimal frustration, that encompasses cognitive and emotional intricacies, can be challenging to accurately measure. Nowadays there is no instrument that captures all nuances. Therefore, attempts to approach the measurement of frustration from an achievement perspective remain very scarce.

5.4. Importance of parents and adolescents spending quality time together

The text also emphasizes an extensively studied issue in the literature which is the importance of parents and adolescents spending quality time together, highlighting the significance of the context in fostering adolescent positive development (Craig and Mullan, 2012). It underscores how leisure and educational activities during this shared time reflect the values and priorities of society. In a culture heavily influenced by virtual experiences and individualism, where life moves at a rapid pace, it becomes crucial for researchers to consider the potential benefits of family interactions during adolescence. In a world where schedules are often dominated by individual and virtual pursuits, family leisure time offers a valuable opportunity for meaningful interaction, effective communication, and the reinforcement of family ties. Moreover, it can serve as a remedy for feelings of isolation that may arise in an environment characterized by individualistic tendencies.

Support is expressed for the idea that, during adolescence, there is a general increase in autonomy as well as a decrease in

relatedness in the relationship with their parents. Furthermore, while the growing sense of autonomy during this period is often associated with a temporary decline of the sense of closeness to parents and increasing conflicts between child and parents, the desire to feel connected to parents is still noticeable (Inguglia et al., 2015).

From a so-called individualistic perspective, it might be tempting to think that parents should foster adolescents' autonomy simply by allowing them unstructured, free, and rule-free leisure time. However, as previously mentioned, adolescents' autonomy is not at all incompatible with guidance. Moreover, autonomy from SDT requires mutual influences involving adolescents and their context, in this case, parents, to promote their progress.

5.5. Enjoyment in structured family leisure time

Related to the previous question, another idea that underlies the paper and that is consistent with previous studies, is the *educational potential of structured family leisure time during adolescence.* The educational potential of family time during adolescence is important because it considers adolescents' use of time in a relational context where the family can play an integral role. *Moreover, this leisure time is positively linked with enjoyment.*

It may seem contradictory to think that structured family leisure time can be even *enjoyable* for adolescents. It is a potential that is not incompatible with enjoyment either. However, it is crucial to understand that structure in leisure does not necessarily imply imposition or coercion (Caride, 2012). Furthermore, leisure time should not be a stress-inducing situation, especially concerning how some parents organize activities in leisure time in which there is no choice for improvisation. Structured leisure can offer gratifying experiences in itself and has significant educational potential. In this sense, it is seen as an educational field that has not been fully explored, not only because it can enhance the individual wellbeing of adolescents but also the overall wellbeing of the family.

In summary, structured leisure time with family during adolescence can not only *be enjoyable for adolescents but also has significant educational potential and can contribute to both individual and family wellbeing.* This underscores the importance of valuing and promoting these shared activities in the development of young individuals and the construction of healthy family relationships, enriching the context of leisure activities, facilitating adolescent's choice of activities, providing supportive control, and mitigating feelings of obligatory participation (Lin et al., 2009).

5.6. Granting autonomy in leisure time activities and daily activities

In another vein, the paper initiates a debate on whether parents respond differently to the development of adolescent autonomy during family leisure time compared to other daily activities.

As previously mentioned, support for adolescent parental autonomy is a dynamic and adaptive process that changes over time and varies in different situations but should never be abandoned. According to the literature, there appear to be continuity patterns in the parenting styles used by parents. For instance, parents' behaviors that undermine adolescents' autonomy during interactions at the age of 16 were predictive of adolescent hostility as young adults (Allen et al., 2002).

During leisure time, a unique phenomenon occurs, which is the symmetry among players, whether it is a screen-based game or a face-playing game. The parental authority figure, therefore, takes a back seat when it comes to game rules. In this way, everyone is equal during playtime, and the idea of parents as natural stressors can be minimized. Therefore, emotional autonomy can be particularly promoted during playtime for this reason, understood as "the establishment of more symmetrical affective bonds than those observed during childhood" (Parra et al., 2015, p. 48).

However, parents still play a vital role in enhancing their child's ability to cope with stressors and in understanding that playtime does not involve frustration of basic needs. Shared leisure time is an optimal moment for parents to provide supportive responses to their adolescents, either by focusing on their emotions (consulting with their adolescents or helping them overcome their feelings) or by focusing on the problem (helping them think of ways to solve the problem) (Fabes et al., 2002).

Two characteristics that protect individuals from frustration and aggression can be distinguished: internal, which refers to psychological aspects, and external, which relates to the social component. Family members constitute the external characteristic during these moments, providing security in achievement. This is the difference that especially varies when adolescents are in the presence of other groups, such as their peers, where they must demonstrate their worth to the group to validate their membership. In the case of the internal characteristic, it serves as the framework that provides adolescents with self-awareness in relation to others, as well as tolerance for frustration.

While there is an involuntary/automatic stress response model, parents can help manage what is voluntary/controlled in shared leisure time. It is expected that during adolescence, there may be a tendency to react to stress through negative control strategies, which can lead to maladaptive adjustment by adolescents. Problem-solving is particularly emphasized in family play, where adolescents can promote cognitive autonomy, meaning they decide what to do or not do, regardless of others' decisions but taking them into consideration. Therefore, in this process, parents can activate primary control coping strategies that aid in emotional development, such as emotional expression, emotional modulation, or emotional-focused social support. Additionally, parents can work on accommodative or secondary control coping, which includes distraction, acceptance, cognitive restructuring, positive thinking, self-encouragement, or minimization during playtime. Lastly, parents should try to avoid passive coping, such as cognitive avoidance, behavioral avoidance, denial, or self-isolation (Compas and Boyer, 2001). Withdrawal or hostility during play can increase tension. If the child is frequently frustrated, quite common in adolescence, they are likely to react with anger or resentment toward others. It is quite likely that some parents may avoid situations in which they know that certain anxiety can be experienced, which is inevitably considered a detrimental feeling. Parents' positive responses to these emotional situations will become one of the major challenges for families.

In any case, sharing this time together, for all the reasons mentioned, leads to positive long-term outcomes. In the face of adolescent frustration, parental resilience and competence are essential to reduce hostile parental reactions toward the adolescent, while parental emotional attributes increase positive parental responses.

5.7. Need to strengthen adolescent belonging bonds during the infancy

Connected to the aforementioned point, it is worth noting the need to strengthen adolescent development, balancing structured activities and family bonds, and belonging in infancy. Families recognize the importance of understanding and addressing the specific issues their adolescents face during their leisure time. Their goal is to prevent this free time from becoming a harmful activity for them.

As previously observed, structured leisure activities have been found to yield favorable educational outcomes among adolescents. Nevertheless, adolescents' time allocation is not exclusively directed toward structured activities; conversely, in a majority of cases, adolescents engage in a combination of both structured and unstructured activities. Over time, with the progression of age, a notable inclination is observed among adolescents to transition away from structured leisure activities. This transition is motivated by a desire to allocate more time to their preferred peer groups, as substantiated by Persson et al. (2007). It is worth noting that unstructured leisure activities often demand lower levels of skill and intrinsic motivation.

It has been established through research, notably by Koutra et al. (2012) and Padhy et al. (2015), that adolescents predominantly focused on unstructured leisure activities tend to exhibit lower levels of subjective wellbeing, heightened substance consumption, and suboptimal academic performance. Nevertheless, it is essential to acknowledge that as adolescents mature, their engagement in unstructured leisure activities becomes an inevitable aspect of their developmental trajectory.

Taking into consideration the constructive impact of structured leisure activities and the demonstrated role of positive familial and domestic sentiments in shielding adolescents from street involvement and delinquent behavior (Persson et al., 2007), it becomes imperative to cultivate—starting in the early years of childhood—attitudes and initiatives that facilitate adolescents' opportunities to spend quality time with their peers within the familial milieu. Adolescents develop various coping mechanisms to deal with frustration resulting from failure. Some may seek support from family while others might resort to avoidance or other less adaptive coping strategies.

5.8. Complexity of paternal and maternal autonomy granting

Determining the best autonomy family granting support during leisure time is presented as a complex task and it is necessary to underline the notion that effective parenting equates solely to fostering encouragement, while ineffective parenting equates solely to granting autonomy, as if these were mutually exclusive concepts.

Understanding the connection between positive frustration and promoting adolescent progress is of paramount importance for parents of adolescents. It involves offering strategies for providing effective support, nurturing resilience, and preventing adverse outcomes, so training parents in need-supporting behaviors to support adolescent autonomous functioning is needed (Meerits et al., 2022). This paper has not addressed the disposition factors associated with adaptive coping when adolescents encounter an optimal frustrating situation, such as the coping strategy of commitment (Connor-Smith et al., 2000; Eschenbeck et al., 2018) or parenting motivational behaviors (Ahmadi et al., 2023). However, It has been mentioned that parental reactions and skills play fundamental roles in successfully facing obstacles, particularly parental empathy and resilience. For instance, research has shown that greater paternal empathy is linked to fathers being more likely to respond positively to their children's frustrations (Ziv et al., 2020).

Scholars have posited that a balanced negotiation of adolescent autonomy and encouragement within the familial context can engender positive outcomes for both individual adolescents and the family unit as a whole. Leisure time is an ideal moment to showcase those abilities. When the pursuit of autonomy is met with receptive and supportive parental attitudes, a conducive environment for constructive exploration and self-discovery is fostered. This, in turn, can contribute to the cultivation of self-esteem, self-efficacy, and a healthy psychological adjustment among adolescents. Conversely, when the endeavor for autonomy encounters rigidity or overly controlling parental approaches, it may culminate in conflictual family dynamics and impede the establishment of a secure and nurturing familial atmosphere. Such discordant interactions could potentially undermine the development of trust, open communication, and emotional closeness, thereby diminishing the overall quality of family relationships. The key point is parental training. It will be imperative to understand the adolescents' needs and their world and to adjust accordingly. Additionally, recognizing one's own parenting competences and helping in training parenting is crucial. Conversely, failure to do so may lead to improperly nurturing the adolescent's autonomy.

6. Limitations

Some limitations should be taken into consideration. Firstly, the paper did not differentiate between the stages of adolescence (early adolescence, middle adolescence, and late adolescence; Gaete, 2015), which exhibit variations in how they approach the central task of identity-seeking. Instead, only a general period of adolescence has been mentioned, neglecting the intrinsic differences of each phase.

Secondly, the adolescent population has been considered uniformly, without delving into the leisure development needs and optimal frustration of young people with disabilities or special needs (Hanna et al., 2005), which also represents a promising line of research. Moreover, adolescents from

different cultures have not been considered although culture and context can influence the perception of optimal frustration. Consequently, future research should examine whether differences in distinct adolescent populations affect optimal frustration.

Thirdly, a substantial portion of the reviewed literature covers studies that pose conceptual questions about family leisure and the adolescent population. Indeed, the search for publications containing the word "frustration" in their title or directly considering it as a topic is limited. Numerous articles are retrieved by combining searches involving "failure" and "frustration," thus associating it with its negative connotations. In contrast, the search using the two main dimensions of parenting, parental responsiveness and parental demandingness (Bornstein, 2019), shed more light on this topic. Thus, given the scarcity of literature regarding frustration and granting autonomy in family leisure time, our analysis was constrained by the scope of the provided information. In some cases, these studies did not capture the complete picture of the experience of optimal frustration concerning family leisure time, especially when the document did not focus on all aspects of the experiences.

Lastly, most of the studies on parenting practices and their influence on adolescent leisure have been focused on families from Western, educated, industrialized, relatively affluent, and developed societies (Xie et al., 2019), being scarce in other contexts. However, this study does not distinguish information on sociodemographic variables in families participating in organized leisure activities and it refers to families in a broad sense. Consequently, information may be overly general.

7. Conclusion and recommendations

Research on adolescent development emphasizes the importance of a positive approach, aiming to identify and strengthen factors that contribute to the health and wellbeing of adolescents. Health encompasses social, physical, and mental aspects, while wellbeing also focuses on personal growth and finding meaning in life. This approach considers adolescents as active agents in their development, valuing their potential rather than viewing them as passive individuals with deficiencies. Context plays a significant role in adolescent development, with the family being a crucial socializing and educational environment. Autonomy is an articulated concept of affective, cognitive, and behavioral dimensions. Efforts to set appropriate limits on children's behavior for the promotion of their autonomy as well as strengthen an optimal and long-lasting relationship in the communicative process are both primary goals for parents in adolescence (Umberson, 1992; Rodríguez-Meirinhos et al., 2020).

In this sense, emerging research on the subject points out that family leisure time can contribute precisely to positive adolescent development, although it is neither the only indicator nor is there a causal relationship between parental relationship and autonomy (Karabanova and Poskrebysheva, 2013).

However, the scientific literature that links specifically positive family leisure to the development of adolescent autonomy is scarce. Added to the aforementioned event is the fact that there is a lack of studies that combine external family assets of limit control and constructive use of leisure time according to Benson's (2006) developmental assets approach. Consequently, this article outlines how frustration in family leisure time can help the emotional, cognitive, and behavioral promotion of adolescent autonomy.

Lessons learned from this topic show—in the first place—that the role of optimal frustration as a parental support mechanism that helps in the development of adolescents' autonomy in leisure time remains as an underexplored area. The maturing state of research discusses the resilience to stress through leisure activities (Schneider and Iwasaki, 2003), mentioning coping with stress on a regular basis, usually from an individualistic approach rather than from a family approach (Plancherel et al., 2006; Park and Kim, 2018), and oriented to situations in which the person is particularly vulnerable (Liu et al., 2023). However, there is no mention of optimal frustration as a mechanism that helps parents create and strengthen emotional bonds in regular situations and in settings where interaction with family members occurs on a daily basis and playfully. Therefore, the relationship between shared family leisure and positive frustration research requires further studies that give this issue a central focus and that address it empirically.

Another conclusion that emerges from this study is that, although family relations theory points out that the development of adolescent autonomy is a reciprocal process, it is the parents who play the main role. They are expected to present a climate of affection and trust capable of generating the development of autonomy in the affective, cognitive, and volitional dimensions in adolescence. The role of the affective component of relationships, together with the setting of educational goals aligned with adolescents' needs, and appropriate educational practices, will help to create a climate that supports positive adolescent development.

In addition to the above, the adolescent developmental trajectory should be analyzed in a contextualized manner. The three fields of adolescent development will overlap and proceed at different paces and at various stages of implementation. In managing family leisure time, parenting should consider the internal dispositions of the adolescent, the resources available to him/her, and the demands experienced and needed for the development of autonomy, in each of its three dimensions. Attention should also be paid to the context in which autonomy develops.

Ultimately, it is essential to understand how parents can best manage the progressive development of their adolescent children's autonomy in leisure time: their capacity to respond to autonomy, the structure provided, and the level of demand offered. As previously said, parents have the capacity to promote or, otherwise, obstruct their adolescent's progress. Positive Parenting Programs arising from the Recommendation of the Council of Europe (2006) and managed by specialized professionals (Martínez and Rodríguez, 2023), may be the most effective approach to support families in developing their parenting competences during adolescence, although shared family leisure time is not specifically addressed.

Author contributions

SR: Conceptualization, Investigation, Supervision, Writing – original draft, Writing – review and editing. AA: Conceptualization, Writing and– review and editing.

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.

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The relationship between family cohesion and adaptability and non-suicidal self-injury behavior in ethnic minority adolescents: a moderating mediation model

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To explore the relationship between family cohesion and adaptability and non-suicidal self-injury behavior among ethnic minority adolescents, as well as the mediating effect of depression and the moderating effect of school connectedness, this study adopts the Family Adaptability and Cohesion Scale, the Non-Suicidal Self-Injury Behavior Questionnaire, the Center for Epidemiological Studies Depression Scale, and the School Connectedness Scale to collect behavioral data from 949 ethnic minority middle-school students. Descriptive statistical analysis and correlation analysis, as well as the mediating and moderating effects, were performed using SPSS 25.0 and the PROCESS macro program. We found that family cohesion and adaptability significantly and negatively predicted non-suicidal self-injury in ethnic minority adolescents ($\beta = -0.28$, $p < 0.001$); depression mediated the relationship between family cohesion and adaptability and non-suicidal self-injury in minority adolescents, with a confidence interval (mediating effect size −0.15, and a Bootstrap 95% CI) of [−0.19, −0.12]. School connectedness moderated the second half of the mediating effect ($\beta = -0.08$, $p < 0.01$).

KEYWORDS

non-suicidal self-injury, family cohesion and adaptability, depression, school connectedness, adolescents

1. Introduction

Non-suicidal self-injury is defined as self-injury behavior that is intentionally caused to the body surface and is unrecognized by society as having been caused with suicidal intention (Brown and Plener, 2017). Long-term and repeated non-suicidal self-injury is related to depression, anxiety, marginal personality, post-traumatic stress, and other psychological disorders (Wen et al., 2020; Zhou and Jiang, 2021; Chen et al., 2022) and is also an important risk indicator for predicting suicide ideation and suicide attempts (Guan et al., 2012). Teenagers are at high risk of self-injuring behavior (Hankin et al., 2015). Previous research has shown that the rate of non-suicidal self-injury among adolescents is on the rise (Plener et al., 2015). The proportion of non-suicidal self-injury among adolescents in China is 36–57% (Jiang et al., 2011). Currently, the domestic research on non-suicidal self-injury of adolescents mainly focuses on middle school students of the Han nationality, while less attention is paid to ethnic minority adolescents living in remote and poor rural areas. Ethnic minority adolescents in this study are considered a group of people of a particular race or nationality living in China where most people are from a different race or nationality

except the Han nationality. In the last 20 years, the mental health levels of ethnic minority adolescents in China have shown a downward trend. Therefore, it is important to explore the influencing factors and mechanisms of non-suicidal self-injury among ethnic minority adolescents and provide theoretical references and practical suggestions for psychological intervention for ethnic minority adolescents.

As one of the main environments for individual growth and socialization, family life has an important impact on the psychological development of teenagers (Chi and Xin, 2001). According to the theory of the family ring model, higher family cohesion and adaptability are conducive to the exertion of family functions (Fang et al., 2004), while families with poor cohesion and adaptability are prone to children suffering from psychosomatic diseases (Dou et al., 2023), behavior irregularities, and other maladjustments (Yi, 1998). Family cohesion and adaptability refer to the emotional connection between family members, the degree of autonomy experienced by individuals in the family system, and the ability of the family system to change its power structure, role relationships, and relationship rules to cope with situations and development pressures (Olson et al., 1979). Research shows that there is a significant positive correlation between family cohesion and adaptability and the mental health levels of junior high school students (Cao et al., 2010), that is, the higher the family cohesion and adaptability, the higher the mental health levels. Another study found that compared with individuals without non-suicidal self-injury, non-suicidal self-injury adolescents have lower levels of family cohesion and adaptability (Lin et al., 2020). Therefore, this study proposes hypothesis 1: family cohesion and adaptability significantly negatively predict non-suicidal self-injury among ethnic minority adolescents.

According to the self-system process model, external environmental resources, such as family cohesion and adaptability, will affect the development outcomes, such as non-suicidal self-injury, through the individual's internal psychological state, such as depression (Ryan and Deci, 2000). As a common emotional state in teenagers, depression is an emotional experience of pain, depression, and sadness caused by an individual's inability to cope with negative events in life (Thapar et al., 2012). According to the experience avoidance model, when family factors trigger individual negative emotions, they may resort to non-suicidal self-injury as a means of escaping unpleasant emotions so that the negative emotions can be alleviated (Wang et al., 2017). Previous research shows that adolescents with early emotional characteristics, such as depression and inferiority, are more likely to suffer from self-injury (Keenan et al., 2014). This implies that individuals with higher levels of depression are more likely to suffer from self-injury (O'Connor et al., 2010). Therefore, this study proposes hypothesis 2: depression plays a mediating role between family cohesion and adaptability and non-suicidal self-injury in ethnic minority adolescents.

Although family cohesion and adaptability may have an important impact on non-suicidal self-injury among ethnic minority adolescents in Yunnan through the indirect pathway of depression, there may be some individual differences in this effect. According to the motivation-volition model, most individuals with self-injury motivation will not continue to attempt self-injury behavior, among which high levels of social support, positive thinking about the future, and goal reinvestment are typical moderating factors (O'Connor et al., 2012).

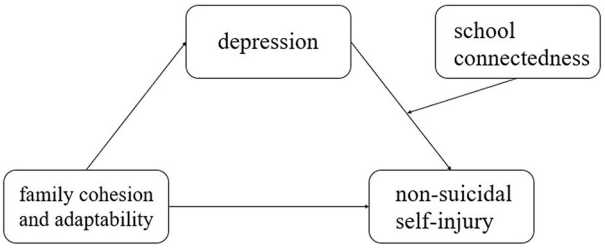

FIGURE 1
Hypothetical model of mediation of depression and regulation of school connection.

The school is an important place to cultivate and form social relationships among young people and provides a suitable social environment for their physical and mental development (Nickerson et al., 2011). Adolescents spend more time in school activities, and social support provided by schools increases the chances of positive mental health development of adolescents (Zou et al., 2022). Studies have shown that students with higher levels of school connection are less likely to experience substance abuse, violent or deviant behavior, suicidal thoughts, or suicide attempts (Lonczak et al., 2002). On the contrary, if students do not experience a connection with their school, do not feel the care of their teachers, or feel that they have no friends at school and do not belong to the school, they will feel lonely and insecure, and they are more likely to use drugs and engage in violent behavior; they are also at greater risk of serious internalizing behaviors such as eating disorders and suicide attempts (Resnick et al., 1993). When students like their school, care about the teacher's opinion of them, respect the authority of the school, and connect with the school, they will actively internalize the school's goals and values, thereby reducing the possibility of negative behavior (Yin and Jia, 2014). Previous research on adolescents showed that school connection had a significant moderating effect between negative emotions and non-suicidal self-injury (Xiang et al., 2019). Additionally, another study showed that school connection had a significant effect on non-suicidal self-injury behavior (Wang et al., 2021).

Based on the motivation-volition model and previous research, this study proposes hypothesis 3: school connection mediates the second half of the mediating effect of family cohesion and adaptation-depression non-suicidal self-injury among ethnic minority adolescents in Yunnan (Figure 1).

2. Methods

2.1. Participants

A total of 1,015 junior middle school students in Yunnan Province were selected as the research participants, and 949 valid questionnaires were recovered, with an effective recovery rate of 93.50%. All participants were from five junior middle schools.

All participants and parents gave informed consent by telephone. Among them, 490 were boys (51.63%) and 459 were girls (48.37%). The average age of the participants was (13.86 ± 0.86) years old and the age range of participants was 10–15 years. More details on the general sociodemographic information of the participants are included in Supplementary Table S1. This study was approved and consented to by the Ethics Committee of the Institute of Psychology, Chinese Academy of Sciences.

2.2. Measures

2.2.1. Family cohesion and adaptability scale

The Second Edition of the Family cohesion and adaptability Scale prepared by Olson and revised by Fei et al. (1991) was adopted, with 30 items in total. A 5-level score was adopted, ranging from 0 (never) to 5 (always). Higher scores indicate that individuals have higher levels of family cohesion and adaptability. In this study, the Cronbach's alpha coefficient of the scale is 0.91.

2.2.2. Questionnaire on non-suicidal self-injuring behavior of adolescents

The non-suicidal self-injuring behavior assessment questionnaire for adolescents (Wan et al., 2018) was conducted to examine whether the adolescents had non-suicidal self-injuring behavior and its related frequency in the last year. It has 12 items in total, and a 5-level score was adopted, ranging from 0 (never) to 4 (always). The higher the score, the higher the degree of non-suicidal self-injury in the last year. There are two types of non-suicidal self-injuring behavior, namely, non-suicidal self-injuring behavior without obvious tissue damage and non-suicidal self-injuring behavior with obvious tissue damage. For example, one item is "Deliberately strangling myself." It has good reliability and validity and can be used as an assessment tool for non-suicidal self-injury behavior and function in Chinese adolescents. In this study, the Cronbach's alpha coefficient of the questionnaire is 0.80.

2.2.3. Epidemic center depression scale

The Chinese simplified version of the Epidemic Investigation Center Depression Scale revised by He Jin (He et al., 2016) was adopted. There were nine items in total. A 5-level score was adopted, ranging from 0 (little) to 3 (most or all of the time). The higher the score, the higher the frequency of depressive symptoms. In this study, the Cronbach's alpha coefficient of the scale is 0.82.

2.2.4. School connectedness scale

The school connectedness scale prepared by Resnick et al. (1993) and revised by Yu et al. (2011) was used. There were 10 items in total, and 5 grades were used, ranging from 1 (completely disagree) to 5 (completely agree). The higher the score, the higher the individual's school connectedness. In this study, the Cronbach's alpha coefficient of the scale is 0.81.

2.3. Procedure

The study was reviewed and approved by the local ethics committee. Before the questionnaire was administered, the school's moral education teachers uniformly trained the head teachers of each class on the test administration process and precautions. The head teacher informed the parents of the test and the parents and students voluntarily signed the informed consent. During the test, the head teacher of each class uniformly organized the subjects to distribute paper questionnaires to answer during the class meeting time. All the subjects completed all the questionnaires within approximately 40 min. After the test was completed, the head teacher took the questionnaires back and kept them confidential.

2.4. Data processing

A unified questionnaire was used for the test. The participants were instructed to answer carefully according to the actual situation, and the confidentiality of personal information was emphasized. SPSS25.0 was used to input and manage the collected data, and descriptive statistical analysis and correlation analysis were carried out. After standardizing scores for each scale, the two models were tested in the PROCESS macro program (Hayes, 2013). Model 4 was used to test the mediating effect of depression, and Model 14 was used to test the moderating effect of school bonding. After Bonferroni correction, the threshold value of $P < 0.05$ was considered statistically significant.

3. Result

3.1. Control and inspection of common method bias

Since data were collected using a self-reported method, the results may be affected by common method bias, so the Harman single-factor method was used to test the common method bias, and 13 factors with eigenvalues >1 were obtained, accounting for 54.82% of the variance. The variance explained by the first factor was 20.33%, less than the critical value of 40%. Therefore, there is no serious common method bias in this study.

3.2. Average, standard deviation, and correlation matrix of each variable

The results of description and correlation analysis showed that (see Table 1) family cohesion and adaptability were significantly negatively correlated with non-suicidal self-injury and depression and significantly positively correlated with school connectedness. There was a significant positive correlation between non-suicidal self-injury and depression, and a significant negative correlation between non-suicidal self-injury and school connectedness. There was a significant negative correlation between depression and school connectedness. Gender and age were significantly correlated with the main research variables, and they were treated as control variables in the subsequent analysis.

TABLE 1 Descriptive statistics and correlation analysis results of each variable ($n = 949$).

	M	*SD*	1	2	3	4	5	6
1. Gender	1.48	0.5	1					
2. Age	13.86	0.86	−0.14***	1				
3. Family cohesion and adaptability	96.66	19.99	−0.08**	−0.04	1			
4. Non-suicidal self-injury	1.87	3.13	0.12***	−0.02	−0.29***	1		
5. Depression	7.52	5.04	0.12***	0.13***	−0.42***	0.43***	1	
6. School connectedness	35.78	6.77	−0.03	−0.11***	0.46***	−0.32***	−0.50***	1

**$P < 0.01$, ***$P < 0.001$.

TABLE 2 The test of mediation model of depression.

Regression equation		Overall fitting index			Significance of regression coefficient	
Outcome variable	Predictive variables	*R*	R^2	*F*	β	*t*
Non-suicidal self-injury	Gender	*0.30*	*0.09*	*32.11***	0.20	3.12**
	Age				−0.02	−0.57
	Family cohesion and adaptability				−0.28	−8.96***
Depression	Gender	0.44	0.20	76.96***	0.21	3.56***
	Age				0.15	4.42***
	Family cohesion and adaptability				−0.40	−13.71***
Non-suicidal self-injury	Gender	0.45	0.21	61.23***	0.12	1.98*
	Age				−0.08	−2.25*
	Family cohesion and adaptability				−0.13	−4.01***
	Depression				0.38	11.62***

*$P < 0.05$, **$p < 0.01$, ***$p < 0.001$.

3.3. The relationship between family cohesion and adaptability and non-suicidal self-injury: a moderating mediation model

First, Model 4 in the PROCESS macro was used to test the mediating effect of depression in the relationship between family cohesion and adaptability and non-suicidal self-injury under the condition of controlling gender and age. All variables except demographic variables have been standardized. As shown in Table 2, family cohesion and adaptability negatively predicted non-suicidal self-injury ($\beta = -0.28$, $p < 0.001$) and negatively predicted depression ($\beta = -0.40$, $p < 0.001$). When family cohesion and adaptability and depression predicted non-suicidal self-injury at the same time, family cohesion and adaptability could still significantly negatively predict non-suicidal self-injury ($\beta = -0.13$, $p < 0.001$), depression significantly positively predicted non-suicidal self-injury ($\beta = 0.38$, $p < 0.001$). The bootstrap method based on deviation correction percentile further found that depression played a partial mediating role between family cohesion and adaptability and non-suicidal self-injury, and its 95% confidence interval was [−0.19, −0.12]. The mediating effect (−0.15) accounted for 53.57% of the total effect (−0.28).

Secondly, Model14 in the PROCESS macro was used to test the moderation effect of school connectedness under the condition of controlling for gender and age. All variables except demographic variables have been standardized. The results are shown in Table 3. After joining the school connectedness, the interaction term of depression and school connectedness significantly negatively predicted non-suicidal self-injury ($\beta = -0.08$, $p < 0.01$). To sum up, family cohesion and adaptability, depression, school connectedness, and non-suicidal self-injury constitute a moderated model with mediation. Specifically, school connection moderated the second half of the path of non-suicidal self-injury of ethnic minority adolescents through depression. Additionally, the moderating role of school connectedness in the first part of mediation has been conducted, but there were no significant results about this moderating role.

In order to better explain the moderating effect, a simple slope analysis was performed. It can be seen from Figure 2 that when the individual's school connectedness level was low (M - $1SD$), depression significantly positively predicted the non-suicidal self-injury of ethnic minority adolescents (βsimple = 0.40, $t = 9.67$, $p < 0.001$). When the individual's level of school connectedness was high ($M + 1SD$), depression still positively predicted non-suicidal self-injury of ethnic minority adolescents, but its predictive effect was reduced (βsimple = 0.24, $t = 4.90$, $p < 0.001$). The results showed that with the improvement of school connectedness, the predictive effect of depression on non-suicidal self-injury of ethnic minority adolescents decreased.

TABLE 3 The test of mediating moderating effect.

Regression equation		Overall fitting index			Significance of regression coefficient			
Outcome variable	Predictor Variable	*R*	R^2	*F*	*β*	*Bootstrap lower limit*	*Bootstrap upper limit*	*t*
Depression	Gender	0.44	0.20	76.96***	0.21	0.09	0.33	3.56***
	Age				0.15	0.08	0.22	4.42***
	Family cohesion and adaptability				−0.40	−0.46	−0.34	−13.71***
Non-suicidal Self-injury	Gender	0.47	0.22	44.65***	0.12	0.01	0.24	2.07*
	Age				−0.09	−0.15	−0.02	−2.52*
	Family cohesion and adaptability				−0.10	−0.16	−0.03	−2.95**
	Depression				0.32	0.25	0.39	9.03***
	School connectedness				−0.11	−0.18	−0.04	−3.12**
	Depression × school connectedness				−0.08	−0.14	−0.03	−2.91**

*$P < 0.05$, **$p < 0.01$, ***$p < 0.001$.

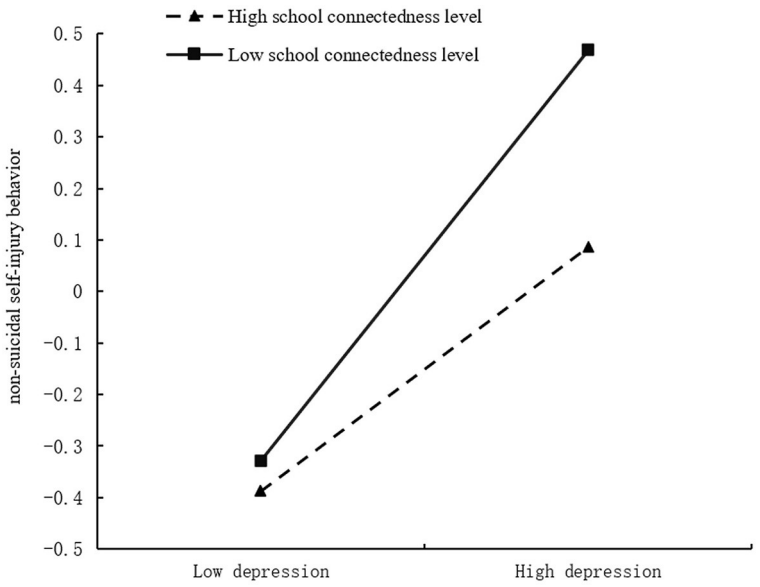

FIGURE 2
The moderating effect of school connectedness.

4. Discussion

4.1. The relationship between family cohesion and adaptability and non-suicidal self-injury

This study found that family cohesion and adaptability significantly negatively predicted the non-suicidal self-injury of ethnic minority adolescents, which is consistent with previous research (Hu et al., 2019; Su et al., 2021). This shows that good family cohesion and adaptability were important protective factors for non-suicidal self-injury in adolescents and provided good environmental conditions for the development of the mental health of adolescents. According to the Circumplex model of marital and family systems, when family members' intimacy and adaptability are unbalanced, such as when family members are overly interventionist or completely indifferent to each other's lives, children will lack attachment and respect for their parents, which leads to emotional problems such as maladjustment to the surrounding environment and being prone to self-injuring thoughts and behaviors (Olson, 2000). Therefore, it is necessary to pay attention to the family environment of ethnic minority adolescents and strengthen the local mental health work related to family education (Fu and Zhang, 2021).

4.2. The mediating role of depression

This study also found that family cohesion and adaptability affect non-suicidal self-injury in ethnic minority adolescents

through depression. When individuals have families with low intimacy and poor adaptability for a long time and lack emotional communication and support from their parents, the family atmosphere will gradually become inharmonious, making the individual feel lonely, depressed, withdrawn, and silent, which leads to depression (Yang, 2001). On the other hand, according to the experience avoidance model, individuals who hurt themselves often fail to regulate negative emotions in an adaptive way, so individuals tend to use self-injury to avoid or alleviate unpleasant emotional experiences (Feng, 2022). Previous studies have shown that relieving negative emotions is the main reason for self-injuring behavior. When self-injury occurs, negative emotions will also be significantly relieved (Lin, 2022). Therefore, ethnic minority adolescents are more likely to develop negative emotions such as depression, when faced with stress or stimuli from their families. Individuals use non-adaptive and inappropriate coping strategies, such as self-injury, to alleviate negative emotions, which may increase the possibility of self-injury. This reminds school mental health workers and relevant departments that when the family cohesion and adaptability of ethnic minority adolescents cannot be improved in a short period of time, they can reduce the levels of depression in adolescents through appropriate psychological counseling and psychological intervention in order to reduce non-suicidal self-injuring behaviors, for example, teaching them more skills and methods to prevent and alleviate emotional problems, such as cognitive reappraisal and interpersonal support, and how to use these methods to solve difficulties in daily learning and life (Fu and Zhang, 2021).

4.3. Moderating effects of school connectedness

This study also found that school connection mediates the relationship between depression and non-suicidal self-injury among ethnic minority adolescents in Yunnan, that is, family intimacy and the second half of the mediating effect of adaptation-depression non-suicidal self-injury. When ethnic minority adolescents feel low family intimacy and adaptability, they are prone to depression, but when they feel a strong school connection, non-suicidal self-injury behaviors caused by depression can be reduced; thus, school connection can intervene in the mental health of ethnic minorities in Yunnan. The process of transformation of depression caused by low family intimacy and adjustment into non-suicidal self-injury among adolescents in ethnic minority areas. School connection is regarded as a protective factor in reducing adolescents' susceptibility to health risks and participation in abnormal behaviors (Dornbusch et al., 2001), and when students have a stronger connection with school, it can reduce emotional distress and suicidal ideation (Resnick, 1997). According to the motivation-volition model, although adolescents from ethnic minorities experience family intimacy and poor adaptability and experience negative emotions such as depression, when they feel the care of teachers and classmates, they will feel that they are members of the school. One molecule produces a higher sense of belonging and happiness, alleviates the process of repeated exposure to pain, and alleviates the occurrence of self-injury behavior to a certain extent (McNeely et al., 2002). Therefore, we need to fully consider the social living environments of adolescents in ethnic minority areas in Yunnan, especially the school environment, and pay attention to the interaction between teachers and students, and between students and students, in order to formulate effective psychological intervention and preventive measures (Burns et al., 2015). For example, schools can strengthen teachers' knowledge surrounding adolescent psychology, treat students with care and fairness, and actively guide students to participate in learning in order to improve support for students and promote students' higher school connection (McNeely et al., 2002) by increasing skills training; encouraging teachers to adopt interactive and cooperative learning methods; setting courses on problem-solving, self-management, and self-control skills; and reducing inappropriate ways of solving problems.

4.4. Limitations

Firstly, this study adopts a cross-sectional design, and it cannot reveal the causal relationship between variables like a longitudinal study, but through an independent cross-sectional sampling study of ethnic minorities, it can improve the overall non-suicidal self-injury rate of adolescents under the condition of avoiding the loss of subjects. In the future, it is necessary to assess the question of intra-individual change over time, and longitudinal research can be used for further verification. Secondly, the data used in this study was self-reported by the students and, therefore, might have a social approval effect. Future research could comprehensively use teacher assessment, parent assessment, and other methods to collect data. Finally, the participants of this study were minority students. Whether the research results could be extended to other groups needs to be further tested. Future research could consider adding more groups (such as the Han nationality) to test and compare results.

5. Conclusions

A total of 949 minority junior high school students participated in the study, SPSS software and PROCESS macro program were used to test the sample data, and the sample distribution was reconstructed through the random sampling of the original samples (a total of 5,000 samples were constructed in this study, each with a sample size of 949 people), and the robust standard error and confidence interval of parameter estimations were obtained. The results showed that family cohesion and adaptability influence non-suicidal self-injury in ethnic minority adolescents through depression, and the second half of the mediating effect was moderated by school connectedness. According to the above conclusions, some suggestions and relevant educational and teaching measures were put forward for psychological intervention in ethnic minority adolescents.

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 Institute of Psychology, Chinese Academy of Sciences. The studies were conducted in accordance with the local legislation and institutional requirements. The participants provided their written informed consent to participate in this study.

Author contributions

JL: conceptualization, methodology, data curation, formal analysis, software, visualization, investigation, supervision, writing—original draft, and writing—review and editing. ZC: funding acquisition, project administration, supervision, and writing—review and editing. All authors contributed to the article and approved the submitted version.

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.

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Supplementary material

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Effect of a mental health education intervention on children's life satisfaction and self-confidence in rural China

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Children living in rural areas may potentially experience low levels of life satisfaction and face challenges in developing self-confidence. The purpose of the current study was to examine the impact of a mental health education intervention on the life satisfaction and self-confidence of children residing in rural areas of China. A total of 1,001 children from grades 4 to 6 were randomly assigned to an intervention group (475 children, 250 boys, $M = 11.57$ years, $SD = 1.082$ years) and a control group (526 children, 279 boys, $M = 11.38$ years, $SD = 0.980$ years). Over 16 weeks, the intervention group received a mental health education program, while the control group did not. The levels of life satisfaction (including five dimensions: family, school, environmental, friends, and self-satisfaction) and self-confidence (including three dimensions: self-efficacy, self-assurance, and self-competence) were rated by all children at baseline and post-intervention. Results from paired samples *t*-test showed that post-intervention, the intervention group exhibited significant improvements in the areas of family, environmental, school, and self-satisfaction as well as self-efficacy, self-assurance, and self-competence. However, there was no significant improvement in friend satisfaction. Conversely, the control group showed decreases in school, environmental, and friend satisfaction, along with decreases in self-efficacy, self-assurance, and self-competence. No significant change was observed in family and self-satisfaction in this group. These findings emphasize the importance of implementing mental health education interventions for rural children, who are at risk for low life satisfaction and self-confidence. Some specific recommendations are provided for policymakers and practitioners.

KEYWORDS

mental health education, life satisfaction, self-confidence, rural children, randomized controlled trial

1. Introduction

Over the past several decades, China has experienced dramatic economic changes, accompanied by rapid urbanization. While these changes have promoted the development of many aspects of Chinese society, they have also magnified disparities between urban and rural living standards. The diminished emphasis on rural education, paired with challenges in

attracting educators to these regions, has considerably impacted the quality of educational opportunities available to children (Pan and Ye, 2017). Moreover, the urbanization process attracts numerous rural adults to migrate to urban areas, in order to increase family income. As a result, many rural communities are currently characterized by a higher concentration of older residents and children who have been left behind (Mohabir et al., 2017). These left-behind children lack parental monitoring, supervision, and support, which can make them more susceptible to heightened psychosocial distress and poor life satisfaction (Wang et al., 2017; Rao et al., 2019). Although altering a student's living conditions may be challenging, researchers and educators can invest efforts to enhance children's mental health, thereby facilitating a more fulfilling life for them. This study aimed to examine the effect of a mental health education program on life satisfaction and self-confidence levels among children residing in rural regions of China, recognized as international poverty-stricken areas.

1.1. Rural children's early development

In rural China, the primary sources of family income continue to be agricultural production. Due to the limited land resources allocated to each family and the unpredictability of natural climatic conditions, rural families' annual incomes are relatively low. Low SES encompasses more than economic constraints; it can significantly impact children's developmental trajectories and overall mental health. For example, Yoshikawa et al. (2012) found that children from low-SES backgrounds had higher levels of psychological stress and were more likely to develop emotional problems and mental health disorders. Similarly, Evans and Kim (2013) showed that children living in low-income households experienced higher levels of environmental stressors and were at a higher risk of developing psychological problems. Low SES not only intensifies the psychological distress in children, but also negatively impacts their overall quality of life, leading to decreased life satisfaction.

1.2. Rural children's life satisfaction

Life satisfaction is an important aspect of children's positive development. Life satisfaction, an aspect of subjective well-being, is a multi-dimensional concept that encompasses a person's contentment with various facets of life, including school, family, friends, environment, and self (Diener et al., 1985). A child's life satisfaction is significantly influenced by their family's SES, with children from low SES families often experiencing a variety of environmental stressors that can negatively impact their perception of life satisfaction (Bradley and Corwyn, 2002; Evans and Kim, 2013). Such children may confront challenges such as housing instability, food insecurity, and limited access to educational resources, which can lower their satisfaction with school and the environment (Evans, 2004; Yoshikawa et al., 2012).

Moreover, rural children typically receive less emotional and educational support from their parents (Wen and Lin, 2012). Rural areas in China refer to places where the population is primarily engaged in agricultural production (National People's Congress, 2021). Compared to towns and cities, rural areas have a more dispersed population distribution, less advanced infrastructure, and lag behind in economic development (Wiggins and Proctor, 2001). Children living in these under-developed rural areas face numerous challenges, chiefly poverty problems and being left behind, both of which significantly impact physical and mental development (Hu et al., 2014; Feng et al., 2015; Li et al., 2020). Poverty takes a severe toll on Chinese children's growth and health. Those raised in impoverished conditions exhibit high rates of developmental delays across communication, gross motor, fine motor, problem-solving, and personal-social domains (Wei et al., 2015). Mental health is also impacted, with higher risks of depression, anxiety, and sleep disorders compared to economically disadvantaged children (Fang et al., 2015).

Moreover, many rural children are left behind as parents migrate to cities for work. In 2021, 7.8 million primary school students were left-behind children across China. Frequently raised by grandparents or forced into self-reliance, these children endure neglect of their emotional, physical, social, and educational needs (Wen et al., 2021). This neglect elevates their risk for mental health problems (Hu et al., 2014; Liang et al., 2017). One systematic evaluation, for instance, found that the incidence of serious mental illness among left-behind youth was 2.7 times higher than non-left-behind peers (Wu et al., 2019). More importantly, impoverished children living in rural areas tend to have lower life satisfaction. Rural children may encounter decreased life satisfaction due to fewer educational and recreational opportunities at home (Duncan et al., 2011). Additionally, rural children often suffer from reduced parental involvement, which can further erode their satisfaction with family and self (Hill et al., 2004). In conclusion, poverty has the potential to significantly impact children's satisfaction in various crucial areas of life. Therefore, interventions that are specifically designed to enhance rural children's life satisfaction are of utmost importance.

1.3. Rural children's self-confidence

Moreover, self-confidence, another vital component of positive child development, entails an individual's belief in their own self-worth and their capacity to achieve life goals (Bandura, 1997). This concept includes several dimensions, such as self-efficacy (belief in one's capacity to attain goals), self-assurance (confidence in one's worth or abilities), and self-competence (perceived ability to execute tasks; Merenda, 2021). Prolonged exposure to poverty-related stressors often results in diminished self-efficacy and self-esteem, both integral to self-confidence (Evans, 2004). For example, Yoshikawa et al. (2012) found that children living in poverty often reported lower self-confidence due to heightened psychosocial stress and diminished opportunities for achievement. Additionally, low levels of parental involvement in education have been linked to a decrease in children's confidence regarding academic accomplishment (Maryani et al., 2018). Evidence suggests that limited access to educational resources and extracurricular activities can also hinder children's development of self-competence and self-efficacy (Evans, 2004).

1.4. Interventions targeting children's life satisfaction and self-confidence

Mental health intervention is a term that refers to any action or activity that aims to improve the mental health and well-being of individuals or groups who are experiencing or at risk of mental health problems (World Health Organization, 2001). It is noteworthy that

mental health interventions can serve as potent mitigating forces to enhance life satisfaction and self-confidence among children in economically disadvantaged conditions (Emmers et al., 2021; Li and Hesketh, 2023). Research shows that mental health interventions, when tailored to children's unique experiences and contexts, can effectively improve their life satisfaction and self-confidence (Weare and Nind, 2011). For example, school-based mental health programs that focus on building resilience, emotional awareness, and social skills have been shown to enhance children's life satisfaction and self-confidence (Durlak et al., 2011). These programs, which include various strategies such as cognitive-behavioral therapy, mindfulness training, and social–emotional learning, can address the adversities that rural children often face. They offer a buffer against the negative impacts of these adversities on children's life satisfaction and self-confidence.

However, these interventions are not without their limitations. The heterogeneity of intervention strategies, combined with variations in implementation and assessment methodologies, can make it challenging to derive definitive conclusions about their effectiveness (Weisz et al., 2013). Furthermore, most of the intervention studies have been conducted in high-income contexts, limiting their generalizability to low-SES settings (Lund et al., 2018). This limitation is particularly relevant for children residing in impoverished rural areas in China. Due to remote locations and a dearth of high-quality educational resources, many students in these areas have limited access to mental health-related knowledge. Finally, for rural children living in disadvantaged environments, there is a universal need for mental health promotion. This support is crucial in helping them alleviate feelings of loneliness, anxiety, depression, and low self-esteem, which can stem from risk factors like low SES and parental migration to urban areas for employment (Guan and Deng, 2019). However, it's noteworthy that most previous intervention studies have typically involved the selection of a limited number of children through random sampling, rather than implementing interventions across entire school populations (Durlak et al., 2011). Indeed, schools play a pivotal role in promoting mental health, given their extensive reach within a significant portion of the population. By offering a comprehensive mental health education curriculum, school-based universal interventions have the potential to improve the overall school environment and enhance students' quality of life (Fazel et al., 2014). Thus, there is a need for school-based interventions that adapt their content to ensure it is comprehensible for rural students, thereby enhancing the overall intervention efficacy.

1.5. Current study

The aim of the current study was to examine the impact of a mental health education program on life satisfaction and self-confidence among children living in rural China. Considering the limited comprehension abilities of younger students, we intend to include all upper-grade students (i.e., those in grades 4–6) from each school as the target of our intervention. By adopting this approach, we aimed to assess the effectiveness of the school-based universal intervention in enhancing the overall mental health of all 4th to 6th-grade students in the intervention group. It was hypothesized that children in the intervention group would experience significant improvements in their levels of life satisfaction and self-confidence, whereas no substantial changes would be observed among children in the control group that did not receive any specific intervention.

2. Method

2.1. Participants

A total of 1,001 children from grades 4 to 6 ($M = 11.47$ years, $SD = 1.033$ years, 529 boys, 472 girls) were recruited from 54 primary schools located in three poverty counties in China: Jingyuan and Jingtai in Gansu Province, and Tailai in Heilongjiang Province. Participants were recruited through contact with educational departments in multiple rural counties. Eventually, these three counties agreed to participate in this study. These counties were previously designated as international poverty-stricken areas, with the average annual income per person falling below 1,500 RMB (approximately 210 USD). However, through concerted poverty alleviation efforts by the Chinese government, these counties were successfully lifted out of poverty by the end of 2020. However, this study took place from September 2019 to June 2020, during which period these counties were still classified as impoverished.

2.2. Mental health education program

The mental health education program utilized in this research was developed by the research team, drawing inspiration from the 'Health & Wellness' curriculum crafted by McGraw Hill in the USA. The original program provides a comprehensive and easily teachable core curriculum that promotes healthy living among students. We adapted it specifically to resonate with rural children in China.

The intervention program includes teaching plan sets for teachers, PowerPoint lessons, teaching materials, and in-class workbooks for student use. Adopting a child-centered perspective, the project emphasizes progressive in-depth learning. The curriculum content is integrated based on dimensions related to life satisfaction (family, school, environment, self, friends) as well as themes of self-cognition. The course consists of four modules: Module 1 focuses on Emotion and Mental Health; Module 2 delves into Self-awareness and Personal Growth; Module 3 addresses Social Relationships, encompassing Family, Peers, and Community; and Module 4 centers on the Pursuit of a Fulfilling Life. Specific curriculum content is tailored according to the comprehension abilities of students in grades 4–6.

2.3. Procedure

The study procedure was approved by the university's institutional review board (IRB). Before participating, children provided signed informed consent. As this intervention adopted a school-based universal intervention approach, all primary schools overseen by the three participating counties were randomly assigned to either the intervention group or the control group. This arrangement ensured that all students from grades 4 to 6 in these schools participated in the project simultaneously. This intervention study was conducted in three stages, detailed below (Figure 1):

Stage 1: Baseline Survey (September 2019). At the beginning of the school year, research assistants conducted a baseline survey with all participating students. Each child completed online questionnaires to report their demographic information (e.g., family income, maternal and paternal educational levels) and to assess their life

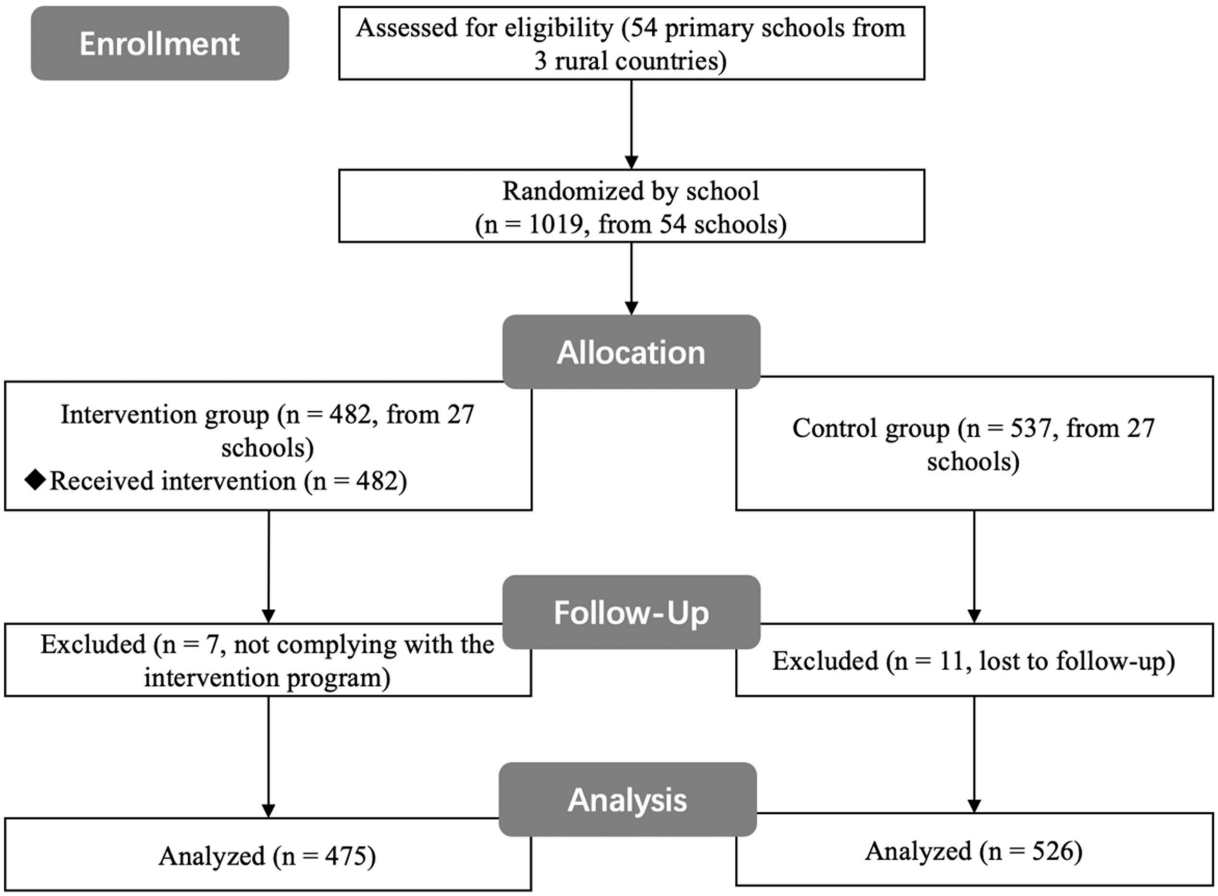

FIGURE 1
The schematic diagram represents data collection points for the intervention group and the control group.

satisfaction and self-confidence. A total sample of 1,019 students was acquired during this baseline survey.

Stage 2: Implementation of the Mental Health Education Intervention (September 2019–June 2020). The whole project lasted 2 years (September 2019–June 2021). In the first year, all primary schools in the intervention group underwent the mental health intervention program, while those in the control group did not receive any intervention and were treated as waiting groups. All the waiting groups were scheduled to receive the intervention in the second year. According to the study aims, we focused solely on the data collected from the first year.

Regarding the scheduling of the intervention sessions, due to the majority of schools being unable to arrange a weekly intervention session based on their existing teaching schedules, it was decided to conduct the sessions bi-weekly. Given that a typical school term in China spans 16 weeks, a total of 16 sessions were conducted (the first term being from September to December 2019, and the second from March to June 2020). Each session, lasting 45 min, covered topics including self-recognition, emotion regulation and mental health, family and parent–child relationships, peer relationships, friendships, and social life. The final session provided an overview without a designated curriculum.

All intervention sessions took the form of classroom-based interventions, resulting in high fidelity from the students. All sessions were administered by regular classroom teachers. Prior to initiating the intervention, teachers underwent intensive training for a week. The training primarily focused on the methodology for each session, potential challenges they might encounter, and strategies to address them. At the end of the training, an assessment was conducted for all teachers to ensure they were adequately equipped to deliver the mental health intervention program. Moreover, during the intervention period, teachers formed teams that met once a week to discuss any challenges faced and collaboratively brainstorm solutions. Through these ways, we ensured that the teachers were well-prepared to deliver the intervention sessions, thereby enhancing the effectiveness of the intervention.

Stage 3: Post-intervention Assessment (June 2020). Following the intervention, all participants completed the same questionnaires once again. Due to illness or school transfer, 18 students were excluded from this study, resulting in a total of 1,001 valid responses. This included 475 from the intervention group and 526 from the control group.

2.4. Measures

2.4.1. Life satisfaction

Children's life satisfaction was assessed using an adapted Chinese version of the Multidimensional Student's Life Satisfaction

Scale (MSLSS; Huebner, 1994; Dong and Lin, 2011). This scale was designed to evaluate children's satisfaction across various important domains in their lives, including school, family, friends, self, and environment. It consists of 25 items and is rated by a 4-point Likert scale ranging from 1 (strongly disagree) to 4 (strongly agree). The original MSLSS is well established (Huebner, 1994) and the Chinese version demonstrates satisfactory reliability and validity (Dong and Lin, 2011). In the present study, the Cronbach's α coefficients for satisfaction with school, family, friends, self, and environment were 0.72, 0.74, 0.81, 0.80, and 0.68, respectively, at the baseline assessment, and were 0.76, 0.77, 0.83, 0.81, and 0.75, respectively, at post-intervention.

2.4.2. Self-confidence

The Children's Self-Confidence Questionnaire (Dong and Lin, 2011) was employed to measure the degree of self-confidence. This scale is composed of 17 items subdivided into three subscales: self-efficacy (6 items), self-assurance (7 items), and self-competence (4 items). A 4-point scale was used to rate each item, ranging from 1 (very inconsistent) to 4 (very consistent). Subscale scores were obtained by averaging item scores, with a higher score indicating a greater degree of self-confidence. This scale has shown satisfactory psychometric properties in previous studies (Dong and Lin, 2011). During the baseline assessment, the Cronbach's α coefficients for self-efficacy, self-assurance, and self-competence were 0.77, 0.87, and 0.63, respectively. The coefficients were 0.80, 0.88, and 0.65, respectively, at post-intervention.

2.5. Data analysis

Preliminary analyses were conducted using SPSS 21 to assess the means, standard deviations, and potential group differences for the study variables. Subsequently, ANOVAs were employed to examine the mean differences in the study variables between baseline and post-intervention for both the intervention and control groups, aiming to evaluate the intervention effect.

TABLE 1 Basic information of the participants in the intervention and control groups.

	Intervention group (n = 475)	Control group (n = 526)	p value
Child sex, boys (girls)	250 (225)	279 (247)	0.97
Child age in years, mean (SD)	11.57 (1.34)	11.38 (1.53)	0.01
Grade, n (%)			
4	197 (41.47%)	229 (43.54%)	0.10
5	155 (32.63%)	181 (34.41%)	
6	123 (25.89%)	116 (22.05%)	
Area			
County JT	148 (31.16%)	98 (18.63%)	0.00
County JY	218 (45.89%)	291 (55.32%)	
County TL	109 (22.95%)	137 (26.05%)	
Maternal education, n (%)			
Primary school	106 (22.32%)	151 (28.71%)	0.70
Middle school	267 (56.21%)	235 (44.68%)	
High School	68 (14.32%)	87 (16.54%)	
College degree	34 (7.16%)	53 (10.08%)	
Paternal education, n (%)			
Primary school	85 (17.89%)	95 (18.06%)	0.97
Middle school	268 (56.42%)	278 (52.85%)	
High School	90 (18.95%)	112 (21.29%)	
College degree	32 (6.74%)	41 (7.79%)	
Sources of family income, n (%)			
Farming	160 (33.68%)	174 (33.10%)	0.78
Rural-to-urban migrant labor	277 (58.32%)	304 (57.79%)	
Others	38 (8.00%)	48 (9.12%)	

3. Results

3.1. Characteristics of participants in the intervention and control groups

In the final sample, the intervention group included 250 boys and 225 girls (M = 11.57 years, SD = 1.082 years), and the control groups included 279 boys and 247 girls (M = 11.38 years, SD = 0.980 years). Table 1 presents additional characteristics of participants in the intervention and control groups.

3.2. Differences in study variables between groups and time

Eight 2 (group: intervention vs. control groups) × 2 (time: pre- vs. post-intervention) ANOVAs with child age and gender as covariates were performed. Results showed that, among all 8 ANOVAs, 7 interaction effects were significant [for family satisfaction, $F(1, 887) = 15.76$, $p < 0.001$; for school satisfaction, $F(1, 883) = 13.90$, $p < 0.001$; for environmental satisfaction, $F(1, 885) = 23.48$, $p < 0.001$; for self-satisfaction, $F(1, 886) = 32.36$, $p < 0.001$; for self-efficacy, $F(1, 887) = 33.39$, $p < 0.001$; for self-assurance, $F(1, 887) = 27.81$, $p < 0.001$; for self-competence, $F(1, 887) = 33.50$, $p < 0.001$]. However, there was no significant interaction between group and time on friend satisfaction. Additionally, neither the main effect of the group nor the main effect of time was significant on all study variables (Table 2).

Results of further *post hoc* comparisons indicated that in the intervention group, the levels of family, school, environmental, and self-satisfaction showed a significant improvement post-intervention compared to baseline measurements. Moreover, there was a significant increase in levels of self-efficacy, self-assurance, and self-competence from baseline to post-intervention assessments.

Finally, *post hoc* comparisons showed that in the control group, there was a significant decrease in the levels of school, environmental, and friend satisfaction. Similarly, the levels of self-efficacy, self-assurance, and self-competence were significantly lower in post-intervention as compared to baseline assessments. However, the levels

TABLE 2 Mean differences in study variables between baseline and post-intervention for the intervention and control groups.

Variables	Intervention group		Control group	
	Baseline *M* (*SD*)	Post-intervention *M* (*SD*)	Baseline *M* (*SD*)	Post-intervention *M* (*SD*)
Family satisfaction	3.56 (0.49)	3.70 (0.44)	3.53 (0.51)	3.51 (0.53)
School satisfaction	3.72 (0.42)	3.77 (0.40)	3.76 (0.36)	3.69 (0.41)
Environmental satisfaction	3.47 (0.47)	3.58 (0.46)	3.38 (0.51)	3.32 (0.57)
Self-satisfaction	3.23 (0.55)	3.44 (0.55)	3.27 (0.56)	3.23 (0.52)
Friend satisfaction	3.65 (0.46)	3.67 (0.46)	3.60 (0.47)	3.55 (0.54)
Self-efficacy	3.12 (0.57)	3.30 (0.53)	3.16 (0.55)	3.08 (0.56)
Self-assurance	3.13 (0.62)	3.34(0.62)	3.22 (0.63)	3.10 (0.65)
Self-competence	2.90 (0.65)	3.06 (0.59)	2.96 (0.64)	2.84 (0.64)

of family and self-satisfaction did not significantly change from baseline to post-intervention assessments.

4. Discussion

Utilizing a randomized controlled trial design, this study examined the effects of a mental health education intervention on life satisfaction and self-confidence among rural Chinese children. The findings revealed no significant differences in life satisfaction and self-confidence dimensions between the intervention and control groups during the baseline assessment. Following a 15-week intervention, a significant enhancement was observed in the levels of family, school, environmental, and self-satisfaction, as well as in self-efficacy, self-assurance, and self-competence among children in the intervention group. Conversely, for children in the control group, there was a decline in the levels of school, environmental, and friend satisfaction. Similarly, post-intervention measures of self-efficacy, self-assurance, and self-competence were significantly lower than their baseline levels for children in the control group.

The significant increase in the dimensions of life satisfaction and self-confidence post-intervention for the children in the intervention group lends support to the efficacy of such interventions, as evidenced in prior studies (Durlak et al., 2011; Weare and Nind, 2011; Merenda, 2021).

Children living in rural areas often grapple with a variety of stressors that significantly impact their mental health and overall well-being (Evans and Kim, 2013). According to Lazarus and Folkman (1984), stress emerges when an individual perceives a situation to exceed their resources. For children in rural areas, poverty is a prominent challenge, and the scarcity of resources—financial, educational, and social—exacerbates their stress, often leading to diminished life satisfaction and self-confidence (Yoshikawa et al., 2012; Maryani et al., 2018). Lazarus and Folkman (1984) further propose that individuals need to learn to reappraise their feelings positively to effectively manage stress. Such reappraisal can be facilitated through targeted interventions that equip children with the necessary skills to navigate their stressors.

Contrary to our hypothesis, friend satisfaction did not show a significant improvement by the end of the 16-week intervention. This may be due to the complex and somewhat resistant nature of peer relationships (Brown and Larson, 2009; Rubin et al., 2011). As children transition into adolescence, their relationships with peers become more complex and begin to play a more significant role in their lives (Marion et al., 2013). Influences such as the onset of puberty, an increase in personal autonomy, and shifts in social contexts complicate these relationships further (Schwarz et al., 2012). In our intervention, the four-week period allocated to improving peer relationships may not have been adequate to effect substantial change within this dynamic. Thus, future peer relationship interventions are encouraged to address the particular challenges to improve peer relationships (e.g., Durlak et al., 2011; Lund et al., 2018). Given the crucial role that peer relationships play in children's early development (Marion et al., 2013; Parker et al., 2015), future interventions specifically designed to enhance peer relationships, such as fostering skills in conflict resolution, communication, and empathy, could offer more valuable insights.

Surprisingly, we found that compared to the baseline assessment, there were significant decreases in the levels of school, environmental, and friend satisfaction, as well as self-efficacy, self-assurance, and self-competence for children in the control group. These findings indicate a potential developmental decline in life satisfaction and self-confidence for children living in rural China. Limited access to resources and the pervasive stress associated with low SES may create a series of challenges that can obstruct psychosocial development, thereby eroding life satisfaction and self-confidence over time (Evans and Kim, 2013). Poverty can disrupt children's daily routines, diminish their sense of security, and limit their access to positive experiences and opportunities (Yoshikawa et al., 2012). For children living in rural areas of China, these factors are often compounded by geographic isolation, poor quality of schooling, and reduced availability of community and social support services (Lund et al., 2018). Given the complex and multifaceted nature of these challenges, it is perhaps unsurprising that children from impoverished rural areas may experience a developmental decline in life satisfaction and self-confidence. This decline underscores the urgent need for interventions aimed at bolstering these areas of children's lives. However, it's worth noting that since we did not investigate the specific factors leading to the decrease in life satisfaction among children in the control group, we cannot establish a clear causal

relationship. Future studies could delve deeper into this issue through longitudinal research.

In this study, we implemented a mental health education intervention aimed at teaching rural children how to effectively manage stressors associated with family dynamics, parental interactions, school environments, and peer relationships. By participating in this intervention, children from impoverished backgrounds residing in rural China may find it easier to reinterpret their life situations and assign them with a beneficial or positive meaning. Mental health education programs have the potential to mitigate some of these adverse effects. By equipping children with strategies to better understand and navigate their emotional experiences, these programs can assist children in reframing their life circumstances in a more positive light. It can promote adaptive coping mechanisms, resilience, and positive psychosocial development, even in the face of ongoing adversities (Durlak et al., 2011; Weare and Nind, 2011). Our findings serve as a stark reminder of the realities faced by many children in impoverished rural areas. Yet, they also underscore the potential for mental health education programs to make a significant difference. By instilling necessary coping skills, these interventions pave the way for children to lead more positive, meaningful lives, even amidst challenges. Most prior intervention studies have commonly selected a limited number of children through random sampling (Durlak et al., 2011). However, in this study, we implemented a school-based universal intervention across all primary schools governed by three rural counties, targeting all students from grades 4 to 6. Such an inclusive strategy has been proven to be effective in enhancing the overall school environment and boosting students' quality of life.

4.1. Limitations and future directions

There are some limitations of the current study. First, due to challenges associated with longitudinal data collection, we only compared children's life satisfaction and self-confidence at baseline and post-intervention. As such, the duration of the intervention's effect remains uncertain. Future research should conduct more extended follow-ups to ascertain the long-term impact of such interventions. Second, our mental health education program took a relatively broad and general approach. Future studies could implement more targeted interventions, focusing on specific areas such as peer relationships or parent–child interactions. In addition, future research could leverage more specialized psychological intervention techniques. Techniques such as cognitive-behavioral therapy and mindfulness-based interventions, which have shown considerable promise in other contexts (Semple et al., 2010; Cheang et al., 2019), could potentially enhance the effectiveness of interventions for children living in rural and impoverished settings. Furthermore, since all of our data were reported by children and considering that children may not fully understand complex family economic situations, we did not collect information pertaining to specific family incomes and other factors indicative of the SES status of the families. Finally, future studies may benefit from conducting further interviews with students who participated in the intervention. This would help identify which aspects of the intervention that contributed to their positive changes. Such insights are valuable for refining and enhancing the interventions.

4.2. Implications

The findings from this intervention study underscore the importance of implementing targeted mental health education programs to improve life satisfaction and self-confidence among children in rural China. The success of this program in enhancing wellbeing highlights the need for policymakers to prioritize mental health initiatives in rural schools. Specifically, officials should fund the development and delivery of socioemotional learning programs tailored to impoverished areas (Jennings and Greenberg, 2009). Teachers require training, resources, and ongoing support to effectively educate students on managing emotions, building self-esteem, and fostering relationships (Wei and Kutcher, 2014). Schools may also implement policies and practices that create positive, supportive environments critical for mental health (Whitley et al., 2013). Counseling services and teacher-student mentoring programs are examples of initiatives that could complement curriculum-based interventions. Comprehensive efforts to improve mental health will empower rural Chinese youth to reach their full potential and interrupt cycles of poverty.

5. Conclusion

In this study, we utilized a randomized controlled trial design to assess the effectiveness of a mental health education intervention on life satisfaction and self-confidence among children in rural China. The findings demonstrated that after a 1-week intervention, significant improvements were observed in family, school, and environmental satisfaction, as well as in self-efficacy, self-assurance, and self-competence among children in the intervention group. In contrast, the control group exhibited declines in school, environmental, and friend satisfaction, along with reduced self-efficacy, self-assurance, and self-competence. This study highlights the crucial role of interventions to enhance positive development outcomes, such as life satisfaction and self-confidence, particularly among children residing in impoverished rural areas. We also provided some specific recommendations for policymakers and practitioners working with children in rural, impoverished areas.

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 the Ethics Committee of the Department of Psychology, Beijing Normal University. The authors assert that all procedures contributing to this work comply with the ethical standards of the relevant national and institutional committees on human experimentation and with the Helsinki Declaration of 1975, as revised in 2008. The studies were conducted in accordance with the local legislation and institutional requirements. Written informed consent for participation was not required from the participants or the participants' legal guardians/next of kin because during the implementation of the project, the teachers involved in the project fully communicated with the parents of students. The parents were fully informed.

Author contributions

ZL: Writing – original draft, Conceptualization, Data curation, Formal analysis, Methodology. KW: Writing – original draft. HW: Writing – original draft. WY: Writing – original draft. CL: Data curation, Investigation, Project administration, Resources, Writing – review & editing.

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Confirmatory factor analysis and gender invariance of the Persian version of psychological control scale: association with internalizing and externalizing behavior problems

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Introduction: The current cross-sectional study aimed to examine the reliability, construct validity, gender invariance and concurrent validity of the psychological control scale-youth self-report (PCS-YSR) among Iranian adolescents.

Methods: A total of 1,453 high school students (49.2% boys; M_{age} = 15.48, SD = 0.97), who aged between 14 and 18 years old completed the PCS-YSR and the youth self-report (YSR) scale of behavior problems.

Results: Reliability was established using Cronbach's alpha and ordinal alpha for maternal and paternal psychological control. The confirmatory factor analysis (CFA) results supported the original unidimensional model of the PCS-YSR scale for both mother and father forms. Results also revealed that mother and father forms of PCS-YSR were invariant across adolescents' gender. When comparing the mean differences, mothers were more psychologically controlling toward their sons, compared to their daughters. The mother and father forms of PCS-YSR were found to have acceptable concurrent validity through their relationship to internalizing and externalizing behavioral problems.

Discussion: Overall, our findings supported the psychometric properties of the Persian version of the Psychological Control Scale-Youth Self-Report among Iranian adolescents. This scale can be used as an efficient tool for parental psychological control among adolescents in Iran. The negative effect of the intrusive parenting behavior on child' negative outcomes in Iran, irrespective of culture, was shown.

KEYWORDS

internalizing and externalizing behavior problems, gender invariance, parental psychological control, reliability, validity

Introduction

During adolescence, the successful development of an autonomous stand toward parents is highly salient. Though parents might be expected to authenticate this independent stance that would support healthy future relationships for their children (Oudekerk et al., 2015), some parents attempt to maintain their influence on their child's psychological world through intrusive strategies of psychological control. Schaefer (1965a) first coined the term psychological control and argued that controlling parents refuse to accept the children's autonomy, which inevitably interfere with adolescent development (Schaefer, 1965b). To elaborate, Barber (1996) defined psychological control as parenting behaviors with forcible intrusion into children's opinions, values, and emotions. Steinberg (1990) and Barber (1996) also posited the existence of four psychological control strategies, namely, guilt-induction, anxiety infusion, love withdrawal, and invalidating the child viewpoint. Parental psychological control, which could have negative effects on adolescents' mental health (Steinberg, 1990; Romm et al., 2020), needs to be differentiated from a positive parenting style of behavioral control aiming to regulate and shape children's behavior, such as manners, study activities, and peer social interactions (Dishion and McMahon, 1998; Stattin and Kerr, 2000).

A few instruments assess parental psychological control, such as the subscale of Psychological Control vs. Autonomy from the Children's Report of Parents' Behavior Inventory (CRPBI; Schaefer, 1965a), is used to evaluate psychological control. The Parental Behavior Inventory (PBI; Lovejoy et al., 1999) that evaluates aspects such as parental demands for obedience, intrusive behavior, and manipulation of affective responses. However, these scales are not focused only and directly on parental psychological control, but measure it alongside or mixed with other parenting behaviors. As a reflection of his proposed theory, Barber (1996) developed the Psychological Control Scale-Youth Self-Report (PCS-YSR), which is the most widely applied measure of youths' perception of their parents' psychological control (Soenens and Vansteenkiste, 2010). This scale assesses the degree that the adolescents appraise the level of psychological control in their parents through their use of strategies like feelings invalidation, suppression of verbal expression, guilt induction, love withdrawal, and unpredictable or unstable emotional behaviors. The PCS-YSR is a self-report questionnaire for youths with two separate forms for mothers and fathers.

Although the 16-item PCS-YSR was originally unidimensional (Barber, 1996), some researchers have investigated the factor structure of this scale, finding that the best fit includes three-factors, namely, invalidating feelings, personal attack, and love withdrawal (Luyckx et al., 2007; García-Pérez et al., 2019; Romm et al., 2020). Previous evidence has supported the satisfactory psychometric properties of this scale across several countries (Barber et al., 2012; Metin-Orta and Metin-Camgöz, 2021). For example, the internal consistency for maternal and paternal control were acceptable (0.62 and 0.67) in an American sample (Barber et al., 2005a), and good (0.83 and 0.76) in the Spanish population (Rodríguez-Menéndez et al., 2021). Regarding the validity of PCS-YSR, the body of research has addressed the negative effect of this parenting behavior on adolescents' substance use (Romm and Metzger, 2018), depressive symptoms (Bleys et al., 2018; Wang et al., 2022), risky cyber behaviors (Romm et al., 2020), delinquency (Zhu and Shek, 2021), and aggression (Murray et al., 2014; He et al., 2019). Given that manipulative techniques of psychological control are used to inhibit the stabilization of a secure sense of self in adolescents and intrude in their psychological world, controlling parents impose the risk of internalizing problems on adolescents (Barber, 1996). In addition, using intrusive behaviors and guilt induction, parental psychological control leave adolescents prone to insecurity and frustration and consequently, to externalizing problems (De Kemp et al., 2006). In other words, adolescents aggressive behaviors are indications of conflict with negative family atmosphere (Stone et al., 2002). The positive association of PCS-YSR with internalizing behaviors, and to some degree, with externalizing problems has also been documented (Janssens et al., 2015; Kaniušonytė and Žukauskienė, 2016; Lu et al., 2017; Van Heel et al., 2019). For instance, Stone et al. (2013) in their study on 298 children found that psychological control has a positive association with internalizing and externalizing problems (Stone et al., 2013). These results have been repeated in adolescent population. Cui et al. (2014) showed that psychological control has a direct relationship with depressive symptoms and aggressive behaviors in adolescents (Cui et al., 2014).

One of the most important gaps in the field of parental psychological control is the shortage of evidence on distinct paternal and maternal psychological control patterns toward sons and daughters across diverse cultural and national backgrounds. Barber et al. (2005b) and Romm et al. (2020) studies indicated that

the overall pattern of psychological control level is comparable, irrespective of child's and parent's gender. However, studies addressing gender discrepancies showed inconsistent results, some indicating higher parental psychological control toward boys (Nelson and Crick, 2002; Endendijk et al., 2016), while others found that parents tended to be more controlling with their daughters (Linver et al., 2002; Domènech Rodriguez et al., 2009). Potential gender differences may be explained through the bio-social theory (Wood and Eagly, 2002, 2012). This theory argues that in the context of gender stereotypes, girl and boy adolescents are treated differently by each parent (Wood and Eagly, 2012). Endendijk et al. (2016) in their review study found that from 1990 onward parents behave with more forcefully and authoritative behaviors toward their sons, whereas employ autonomy supportive strategies (such as empathy, kindness, and relational harmony) for their daughters. Additionally, despite rapid shifts from a traditional and collectivistic culture to individualistic and modern values in Iranian society (Abbasi et al., 2002), some gender stereotypes still exist in the parenting behaviors. Therefore, further evidence concentrated specifically on comparing the level of mother and father control independently on boy and girl adolescents is needed. It can shed light on how gender dynamics affect parenting strategies, explore their distinct consequences for adolescent development more comprehensively, provide insights into whether girls and boys manifest behavior problems differently in response to parental control strategies, and lead researchers and practitioners to tailored strategies and more culturally sensitive interventions of parental control. The current study is first-of-its-kind that as a secondary aim, explored the gender differences in mothers' and fathers' level of psychological control toward girl and boy adolescents in Iran, as a Middle-eastern country.

To address the abovementioned gaps in the literature, the present study aimed to evaluate the psychometric features of the PCS-YSR among Iranian adolescents. To elaborate, we aimed to examine: (a) *Cronbach*'s alpha, composite reliability, and Ordinal alpha reliability tests of PCS-YSR, (b) the factor structure of PCS-YSR based on the unidimensional structure (Barber, 1996), combined and separately for mother and father forms, (c) gender invariance across girl and boy adolescents to assess the gender discrepancies in the perception of parental psychological control concept, (d) concurrent validity by the link of the mother and father psychological control with internalizing and externalizing behavior problems, as well as the discriminant validity, and (e) the correlation of the mother and father psychological control with children's gender. We hypothesized that mothers' and fathers' psychological control would have a positive correlation with both internalizing and externalizing behavior problems in children.

Materials and methods

Research design

The current validation study was designed as a cross-sectional research (Kesmodel, 2018; Wang and Cheng, 2020).

Participants

The sample was comprised of 1,453 Iranian high school students (49.2% boys; age range = 14–18 years; M_{age} = 15.48, SD = 0.97). The inclusion criteria were age between 14 and 18 years old and attending high school. Using convenience sampling method, the participants were recruited from 9th (16%), 10th (37.9%), 11th (27.6%), and 12th grades (18.6%) of only boy schools (n = 3) and only girl schools (n = 3) in the city of Tehran. Regarding fathers' and mothers' educational level, 21.8 and 18.5% had academic education, 74.7 and 77.4% had a diploma or lower education, and a mere of 3.5 and 4.1% had no formal education. Most fathers (95.7%) were employed, while only 15.5% of mothers were employed. Also, 3.7 and 84.4% of fathers and mothers were unemployed/housekeeper, and 0.6 and 0.1% of fathers and mothers were retired, respectively. Family structure included 89.9% adolescents living with both parents, 8.7% living with a single parent, and 1.4% living with others or alone.

Materials/instruments

Parental Psychological Control

The 8-item self-administered measure of the Parental Psychological Control Scale-Youth Self-Report (PCS-YSR) was developed by (PCS-YSR; Barber, 1996) to assess parental psychological control. Adolescents rated how much items could correctly describe their parents in separate forms, where higher scores were reflective of higher level of psychological control. Items were rated on a Likert scale, ranging from 1 (*not like him/her*) to 3 (*a lot like him/her*). The sample item from the scale included: "*My mother/father is a person who always often interrupts me*". Adequate internal consistency was reported in the study of Rodríguez-Menéndez et al. (2021), with *Cronbach*'s alphas of 0.83 and 0.76. for maternal and paternal psychological control in the Spanish population.

Adolescence Behavior Problems

Youth Self-Report (YSR; Achenbach, 1991) was used to measure behavior problems among adolescents. Internalizing scale comprised three subscales of: (a) anxious/depressed, (b) withdrawal/ depressed and (c) somatic complaints. The externalizing scale included: (a) rule-breaking, and (b) aggressive behavior. On a Likert scale, the questions were rated between 0 (*not true*) and 2 (*very true or often true*). The Persian version of YSR (Fadaie et al., 2009) was used in this study and the alphas were 0.92 and 0.91 for Internalizing and Externalizing problems, respectively.

Procedure

To translate the PCS-YSR, a bilingual team including a linguist and three experts in mental health translated the scale into the Persian language, and afterward, back-translated it into the English language based on the back-translation guidelines (Guillemin et al., 1993). The linguist expert checked the back translated version and established its consistency with the original scale. With conducting

a pilot study, thirty high school students (50% girls) primarily completed the PCS-YSR to evaluate its reliability and validity, as well as to answer questions rated on a scale between 0 = "*not understandable*" to 5 = "*quite understandable*" regarding the Persian scale's clarity. The evaluation showed 0.98% of participants in this pilot group found items intelligible, hence, the item revision was unnecessary. We did not include these students in the original study. Next, 16 schools from 16 diverse districts of Tehran city (four schools for each of lower city areas, lower middle areas, upper middle areas, and upper city areas) were invited to participate in this research. Among them, 6 schools from all districts (one school from lower city areas, two from lower middle areas, two from upper middle areas, and one from upper city areas) accepted the invitation and took part (response rate at the school level = 37.5%). A total of 1,800 students met our inclusion criteria. A majority of 1,453 out of 1,800 students accepted to take part (verbal assent to participate) and all of their parents signed the consent forms (the response rate at the student level = 85.28%). They were provided with a link for completing the online questionnaires. This study received approval from the ethics board of the Iran University of Medical Sciences (approval code = IR.IUMS.REC.1400.084), and is also in compliance with the Declaration of Helsinki developed by the World Medical Association (WMA, 2000) that specified the ethical principles when human subjects are involved (Bošnjak, 2001; Tyebkhan, 2003).

Statistical analysis

To conduct the data screening, IBM SPSS Statistics (Version 28) was used. As indicated in **Table 1**, all items of PCS-YSR were homogeneous with no missing data, because the format of the response sheet in online data gathering needed to be submitted by the user after responding to all items (n = 1,453). All items met the univariate outlier criteria [$-2.00 > Z_x < +2.00$]. The decision to keep or remove outliers was made based on the comparison of the original mean with a 5% trimmed mean. That is, we conducted data analyses using original data with keeping the outliers, along with using robust estimation for estimating related parameters (Tabachnick et al., 2007). We applied maximum likelihood with robust standard errors (MLR) estimation method, using Mplus version 8.8 (Asparouhov and Muthén, 2022), to test the *a priori* model of the confirmatory factor structure of the PCS-YSR. This type of analysis provides less bias and more accurate results for ordinal Likert-type scales (Mindrila, 2010; Li, 2016). As depicted in **Table 1**, the test of the assumption of normality revealed a mostly negative but non-substantial skewness in all items (Gravetter et al., 2020).

Data analyses was as follows: First, as recommended for ordinal Likert-type scales, the internal consistency was examined using the composite reliability and ordinal alpha reliability coefficients by semTools and psych Packages (Revelle, 2015) in R version 4.1.2 (Revelle, 2017). Ordinal alpha is the equivalent of *Cronbach*'s alpha coefficient, which instead of the Pearson correlation matrix, are according to the polychoric correlation matrix (Zumbo et al., 2007; Gadermann et al., 2012). As suggested by Cicchetti (1994), a correlation coefficient of 0.70 or higher was considered as an acceptable level of internal consistency of the items. The corrected item-total correlation's values were interpreted as: 0–0.19 (not well discrimination), 0.2–0.39 (good discrimination), and 0.4 and above (very good discrimination) (Ferketich, 1991). The interpretation of mean of inter-item correlations was classified as: poor (not correlated well; below 0.15), and good (0.15–0.50). In addition, values of Inter-item correlation higher than 0.50 are the indicator of strong correlation between items, which may show that items have repetitive content (Hair et al., 2006).

Second, to test the construct validity of the PCS-YSR, the CFA was conducted using four models. Model 1 (M_1) examined a general factor for mothers resembling the exploratory factor analysis conducted by (Barber, 1996), in which the total 8 items loaded on one common factor of parental psychological control to test the unidimensional model of assumed latent factor and include random measurement error and indicator-specific variance (Gustafsson and Åberg-Bengtsson, 2010). Model 2 (M_2) consisted of the same model but for fathers. Model 3 (M_3) examined a unidimensional-factor with correlated errors model for mothers, and Model 4 (M_4) tested the same as model 3, but for fathers.

To assess the "goodness-of-fit," the following statistical tests and indices were employed (acceptable values in parenthesis): the chi-square (χ^2; desirable that $p > 0.05$), the standardized root mean square residual (SRMR < 0.05), the root mean square error of approximation (RMSEA < 0.05), and its 90% confidence interval, the comparative fit index (CFI > 0.95), the Tucker–Lewis index (TLI > 0.95), and the normalized chi-square (χ^2/df < 3) (Bentler and Bonett, 1980; MacCallum et al., 1996; Maruyama, 1997; Loehlin, 2004; Miles and Shevlin, 2007). The exact fit is defensible when χ^2 is not significant, regardless of the SRMR value. In case chi-square is significant, SRMR $\leq$ 0.08, and standard residuals are all small ($|r_{res}| < 0.1$), approximate fit is tenable. Finally, if chi-square is significant and SRMR > 0.08, poor fit is concluded. To further compare the competing models' fit, the Bayesian Information Criterion (BIC) was also reported. The model that possesses the lower BIC value fits best.

Third, after model selection, measurement invariance across genders was tested. Invariance of factorial structure/pattern, factor loadings (weak invariance), item intercepts (strong), and finally item residuals or unique variances (strict) were examined. In the case of invariance, first, we compared the RMSEA values and RMSEA confidence intervals of the nested models. For instance, when comparing the configural and metric invariance models, falling the RMSEA values within the confidence intervals of one another is an indicative of metric invariance. Then, we tested to observe any changes in the nested models' CFI, RMSEA, and SRMR. Measurement invariance can be supported if two of the following indices are satisfied: ΔCFI $\leq$ 0.01, ΔSRMR $\leq$ 0.01 and ΔRMSEA $\leq$ 0.015 for the test of intercept invariance and residual invariance, and ΔCFI $\leq$ 0.01, ΔSRMR $\leq$ 0.03, and ΔRMSEA $\leq$ 0.015 for the test of factor loading invariances (Cheung and Rensvold, 1999, 2002; Sass et al., 2014).

Fourth, concurrent validity was evaluated by the *point-biserial* correlation and *Kendall's coefficient* of rank correlation (τ_b) of maternal and paternal psychological control with behavior problems, gender, and grade because the data showed evidence of non-normality. The interpretation of correlation coefficients was based on Cohen (1988) suggestion: the effect sizes of small = $\leq$0.10, medium = 0.30, large = 0.50, and very large = $\geq$ 0.70. Discriminant

validity was also conducted through Average Variance Extracted (AVE).

Results

Internal reliability

Table 1 presents the descriptive statistics of PCS-YSR. Almost all the items had a moderate positive relationship with each other based on the corrected item-total correlation for maternal and paternal forms' items —with values ranging from 0.23 to 0.63 (mothers' form) and 0.39 to 0.65 (fathers' form). The means of inter-item correlation, ordinal alpha reliability, *Cronbach*'s alphas, and composite reliability were 0.36, 0.90, 0.81, and 0.81 for maternal control and 0.40, 0.92, 0.83, and 0.83 for paternal control, respectively.

Factor structure

As indicated in Table 2, unidimensional model (M_1 and M_3) did not meet most of the specified fit criteria (i.e., CFI > 0.95, RMSEA < 0.05, TLI > 0.95, $\chi^2/df < 3$). As part of the next step, after freeing the error covariance of 2 pairs of items, a one-factor item-correlated errors model for mothers (M_2; $\chi^2/df = 3.54$; CFI = 0.98; TLI = 0.97; and RMSEA = 0.04; 90% CI = 0.03 to 0.05) and fathers (M_4; $\chi^2/df = 3.34$; CFI = 0.98; TLI = 0.97; and RMSEA = 0.04; 90% CI = 0.02 to 0.05) provided a better fit.

Model selection

The principle of parsimony (Bollen, 1989), results in Figures 1, 2 and Table 2 showed the one-factor correlated errors model (M_2) for mothers and (M_4) for fathers fits the data well, with those of corresponding models as the baseline/null model, then indicated that the one-factor correlated errors model (M_2 and M_4) were the optimal/parsimonious models for both parents.

Measurement invariance across gender

In seeking whether measurement of PCS-YSR was equivalent across the gender of the child ($n_{girls} = 769$ and $n_{boys} = 765$) for mothers' and fathers' forms, we ran the multi-group CFA. Primarily, we ran the CFA in a total sample and then, separately for both girls and boys in order to achieve an adequate fitness for each baseline model, on the basis of the parsimony and meaningfulness perspective (Werts et al., 1976). As seen in Table 2, the one-factor model with correlated error covariance was run (diagonal error covariance which freed between items including 8–7, and 2–3) in both boys' and girls' groups, separately for mothers' and fathers' forms, to get in a baseline model (Werts et al., 1976). Configural invariance or factorial structure/pattern, strong factorial invariance, and weak factorial invariance were evaluated (Byrne et al., 1989; Meredith, 1993; Cheung and Rensvold, 2002).

As indicated in Table 2, the hypothesized measurement invariances of PCS-YSR for both parents (i.e., unidimensional and correlated errors model) fitted the data well, showing that the same construct was being measured across gender of the child. In other words, the equivalent factor structure, pattern of factor-indicator relationships, factor loadings, and item intercepts were found across the child's gender in both parents' forms. Finally, according to Table 2, the comparison of configural with baseline model, metric with configural model, scalar with metric model, strict with scalar model were conducted. It could be concluded that the one-factor model with correlated errors is the parsimonious model across gender of child for both parents' forms.

Concurrent and discriminant validity

Table 3 presents the correlation coefficients between the maternal and paternal control; based on the unidimensional model. Maternal and paternal control had a significant association with each other, with correlation coefficients of 0.62 and 0.64 for girl and boy adolescents, respectively. As displayed in Table 3, the maternal and paternal psychological control had a significant positive correlation with YSR ($p < 0.01$), showing its concurrent validity. The correlation coefficients for internalizing problems were 0.44 (with maternal control) and 0.47 (with paternal control), and for externalizing problems were 0.43 (with maternal control) and 0.44 (with paternal control). The relations between demographic variables (gender and grade) and PCS-YSR were examined by *Kendall*'s coefficient of rank correlation (τ_b). As Table 3 depicts, no significant relations were found between grade of children with both mother and father forms of psychological control. Adolescents' gender was significantly and negatively correlated with maternal ($r = -0.09$, $p < 0.01$), but not paternal psychological control. Thus, mothers have a more likelihood to show psychological control toward their sons than daughters. However, paternal psychological control remains the same, regardless of the child's gender. Discriminant validity through AVE (Table 2; Factor Analysis) were also acceptable—-0.54 and 0.59 for maternal and paternal psychological control, respectively.

Discussion

The current study sought to investigate the psychometric characteristics of the adapted version of the PCS-YSR scale among Iranian adolescents. Primarily, the result supported the reliability of this scale. A unidimensional model fits the data best, that was quite consistent with the original model of Barber (1996). Further support was also provided for the concurrent validity of the PCS-YSR scale, with demonstrating a positive correlation with internalizing and externalizing problems. In addition, the result supported the gender invariance of this scale, while mothers manifested higher level of psychological control toward their sons. Overall, the current results confirmed that PCS-YSR is a reliable and valid scale to be applied in the Iranian adolescent population.

Regarding the scale's reliability, the *Cronbach*'s alpha, Ordinal alpha, and composite reliability coefficients were satisfactory for

TABLE 1 Items mean, standard deviation, skewness, kurtosis, corrected item-total correlations, and reliability of PCS-YSR.

	Item No.	M	SD	SK	KU	r^{cs}	Ordinal alpha	OACID	AVE	CR	Factor loadings	Total M (SD)	Boys M (SD)	Girls M (SD)
Maternal control	My Mother is a person who. . .								0.54	0.81		11.30 (2.68)	11.55 (2.68)	11.04 (2.57)
	1. . . . Is always trying to change how I feel . . .	1.677	0.489	−0.487	−1.098	0.23		0.92			0.26			
	2. . . . Changes the subject whenever I have . . .	1.327	0.478	0.862	−0.930	0.54		0.89			0.57			
	3. . . . Often interrupts me.	1.313	0.481	1.031	−0.378	0.57		0.88			0.62			
	4. . . . Blames me for other family . . .	1.310	0.476	1.001	−0.535	0.60	0.90	0.88			0.69			
	5. . . . Brings up past mistakes when . . .	1.466	0.520	0.372	−1.323	0.59		0.88			0.66			
	6. . . . Is less friendly with me if I do . . .	1.373	0.495	0.671	−1.187	0.63		0.88			0.72			
	7. . . . Will avoid looking at me when I have . . .	1.390	0.501	0.619	−1.202	0.61		0.88			0.64			
	8. . . . If I have hurt her feelings, stops talking . . .	1.444	0.521	0.488	−1.172	0.56		0.88			0.58			
Paternal control	My Father is a person who. . .								0.59	0.83		11.07 (2.67)	11.07 (2.68)	11.08 (2.67)
	1. . . . Is always trying to change how I feel . . .	1.625	0.509	−0.221	−1.264	0.39	0.92	0.93			0.42			
	2. . . . Changes the subject whenever I have . . .	1.257	0.446	1.247	−0.073	0.55		0.91			0.58			
	3. . . . Often interrupts me.	1.258	0.450	1.294	0.189	0.61		0.90			0.65			
	4. . . . Blames me for other family . . .	1.296	0.465	1.030	−0.578	0.62		0.90			0.71			
	5. . . . Brings up past mistakes when . . .	1.473	0.519	0.330	−1.376	0.59		0.91			0.67			
	6. . . . Is less friendly with me if I do . . .	1.348	0.489	0.805	−0.936	0.65		0.90			0.73			
	7. . . . Will avoid looking at me when I have . . .	1.368	0.493	0.692	−1.155	0.61		0.91			0.63			
	8. . . . If I have hurt her feelings, stops talking . . .	1.452	0.514	0.381	−1.412	0.57		0.91			0.58			

M, mean; SD, standard deviation; SK, skewness; KU, kurtosis, r^{cs}, corrected item-total correlation; OACID, ordinal alpha coefficient if item deleted; AVE, average variance extracted (AVE) for discriminant validity; CR, composite reliability.

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TABLE 2 Invariance analysis for CFA of the PCS-YSR across gender in one-factor oblique correlated errors model.

Model	χ^2(df)	χ^2/df	AIC	BIC	CFI	TLI	RMSEA	SRMR	Base model	$\Delta\chi^2$	ΔCFI	Δ TLI	Δ RMSEA
M_1	219.726 (20)	10.98	14316.006	14444.030	0.923	0.892	0.081 (0.070–0.090)	0.041	–	–			
M_2	63.641 (18)	3.54	14112.778	14251.470	0.982	0.973	0.041 (0.030–0.052)	0.024	M_1	130.43***	0.059	0.081	0.04
M_3	234.135 (20)	11.71	13477.171	13605.195	0.923	0.893	0.084 (0.074–0.093)	0.041	M_1	−14.40	0.000	0.001	0.003
M_4	60.256 (18)	3.34	13236.043	13374.735	0.985	0.976	0.039 (0.029–0.050)	0.021	M_3	51.91***	0.062	0.083	0.045
Measurement invariance for mothers across child gender													
Boys	40.336 (18)	2.24	7201.987	7322.624	0.983	0.973	0.04 (0.024–0.057)	0.04	M_2	19.92	0.001	0.000	0.001
Girls	41.823 (18)	2.32	6872.420	6993.124	0.981	0.971	0.042 (0.025–0.058)	0.026	M_2	21.82	0.001	0.002	0.001
Configural	82.181 (36)	2.28	14074.407	14351.792	0.982	0.972	0.041 (0.029–0.053)	0.027	M_2	19.47	0.000	0.001	0.000
Metric	91.062 (43)	2.11	14068.643	14308.688	0.982	0.977	0.038 (0.027–0.049)	0.029	Configural	7.67	0.000	0.005	0.003
Scalar	91.062 (43)	2.11	14068.643	14308.688	0.981	0.976	0.038 (0.027–0.049)	0.032	Metric	0.000	0.001	0.001	0.000
Measurement invariance for fathers across child gender													
Boys	42.943 (18)	2.38	6699.132	6819.769	0.982	0.973	0.043 (0.026–0.059)	0.027	M_4	17.31	0.003	0.003	0.004
Girls	42.058 (18)	2.38	6564.559	6685.263	0.983	0.973	0.042 (0.025–0.058)	0.025	M_4	18.20	0.002	0.003	0.003
Configural	84.991 (36)	2.36	13263.691	13541.076	0.983	0.973	0.042 (0.031–0.054)	0.026	M_4	24.35	0.002	0.003	0.003
Metric	92.397 (43)	2.14	13254.317	13494.362	0.983	0.977	0.045 (0.042–0.048)	0.029	Configural	4.73	0.000	0.004	0.003
Scalar	92.397 (43)	2.14	13254.317	13494.362	0.982	0.977	0.039 (0.028–0.050)	0.029	Metric	0.000	0.001	0.000	0.006

M_1 = one-factor model for mothers, M_2 = one-factor and correlated errors model for mothers (items: 7–8, and 2–3), M_3 = one-factor model for fathers, M_4 = one-factor and correlated errors model for fathers (items: 7–8, and 2–3), χ^2 = chi-square, df, degrees of freedom; TLI, tucker–Lewis index; CFI, comparative fit index; χ^2/df = normal chi-square; AIC, Akaike's information criterion; BIC, Bayesian information criterion; SRMR = standardized root mean square residual; RMSEA, root mean square error of approximation; $\Delta\chi^2$ = significant χ^2 change indicates non-invariance of the model that hierarchically was compared with the previously ordered model. ***$p < 0.001$.

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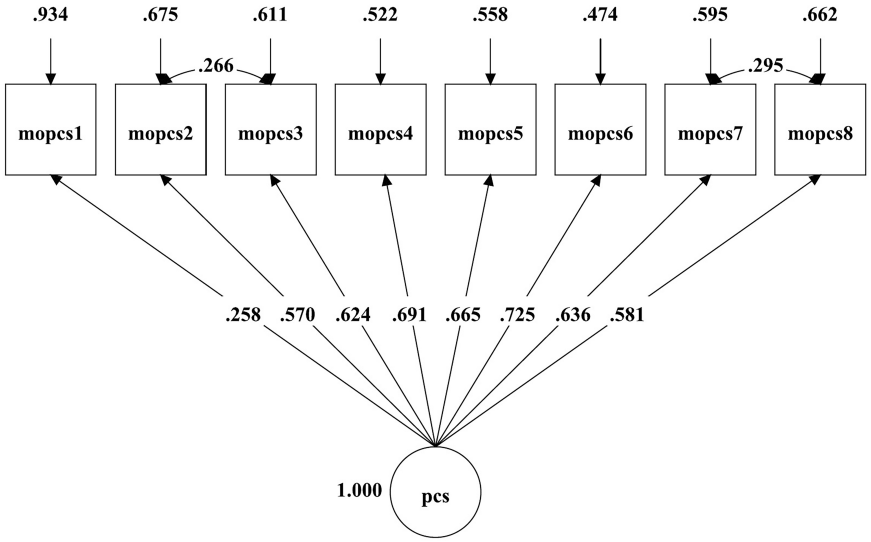

FIGURE 1
The one-factor correlated errors model of maternal psychological control.

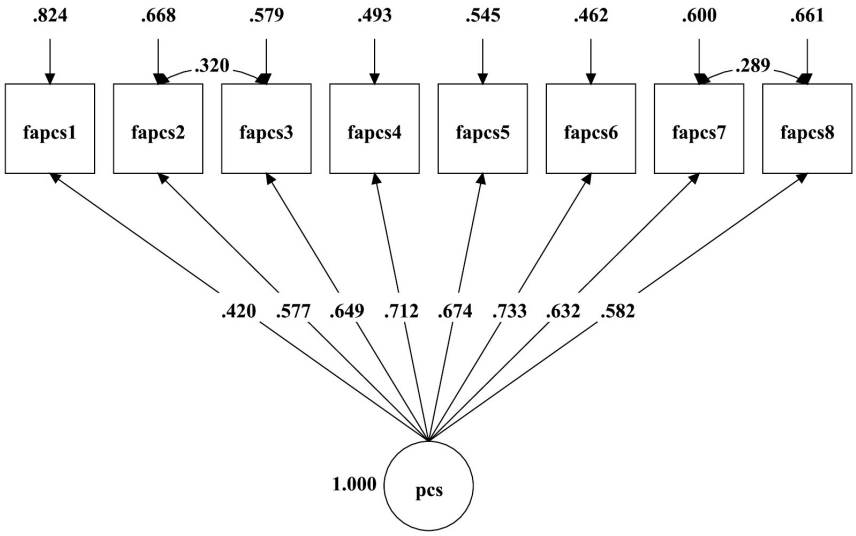

FIGURE 2
The one-factor correlated errors model of paternal psychological control.

mother and father psychological control. The means of inter-item correlations were sufficient (0.36 for maternal control and 0.40 for paternal control), since poor correlation shows a lack of similarity between items, and strong correlation implies that items are quite similar and are measuring the exact same content (Hair et al., 2006). The values of corrected item-total correlation for maternal and paternal forms' items have shown good and very good reliability (Ferketich, 1991). These findings were consistent with earlier evidence (e.g., Rodríguez-Menéndez et al., 2021) and generally supported the excellent reliability of PCS-YSR among Iranian adolescents.

CFA findings revealed that the structure of PCS-YSR with one factor could describe the data best. Both paternal and maternal psychological control CFA findings revealed a good equivalence with the original one-factor version in our sample. It suggests that the structure of PCS-YSR is consistent among mothers and fathers. This result is in line with the single factor initially developed by Barber (1996) and further studies (Galambos et al., 2004; Snoek et al., 2007; Li et al., 2013). Moreover, the highest factor loadings was found in items 4 to 6, which mesh with the results of Barber et al. (2012) and Rodríguez-Menéndez et al. (2021). In general, the optimal fit indices were found for both each item and the overall measure in the present study.

The multi-group CFA revealed equalities in the item-to-item correlation matrices, as well as configure, metric, scalar, and strict invariance (Vandenberg and Lance, 2000; Byrne, 2001; Cheung and Rensvold, 2002; Meredith and Teresi, 2006) across gender. The measurement invariance indicates that girls and boys

TABLE 3 Correlations between the PCS-YSR, gender, grade, and behavior problems (n = 1,453).

Construct	1	2
1. Maternal psychological control	1	0.62**
2. Paternal psychological control	0.64**	1
3. Gender	−0.09**	0.01
4. Grade	0.04	0.03
5. Anxious/depressed	0.40**	0.43**
6. Withdrawal/depressed	0.37**	0.40**
7. Somatic complaints	0.41**	0.44**
8. Internalizing problems	0.44**	0.47**
9. Rule-breaking behavior	0.37**	0.35**
10. Aggressive behavior	0.41**	0.46**
11. Externalizing problems	0.43**	0.44**

The inter-correlation related to Parental Psychological control below the diagonal is for girl adolescents, and above the diagonal is for boy adolescents. **$p < 0.01$.

perceived the scale items equally and the similar construct was measured across gender. This finding implies that any discrepancies between girls and boys in the level of parental psychological control would be a result of real differences in the latent factor, instead of structural differences (variation in the perception of the items' concepts) (Vandenberg and Lance, 2000).

The concurrent validity of PCS-YSR was supported through its moderate positive association with behavior problems. Unsurprisingly, the psychological control scores in both mothers and fathers were positively correlated with internalizing problems, including anxious-depressed, depressed-withdrawal, and somatization symptoms. It was expected because internalizing problems are believed to be the underlying developmental and psychological outcome of parental psychological control (Barber, 1996). The critical tone, which usually accompanies parental psychological control, may insecure adolescents regarding their capacities and suppress their sense of competence. Furthermore, perceived parental psychological control may weaken the parent-adolescent bonding-a threat that may be transferred to other relationships (Barber et al., 2005b). Consistent with earlier findings demonstrating that manipulative parenting strategies employed in parental psychology control may elevate susceptibility to internalizing problems (Wouters et al., 2018; Gorostiaga et al., 2019; Cai and Tu, 2020). Moreover, paternal and maternal psychological control had a positive correlation with externalization problems of rule-breaking and aggressive behavior. Intruding behaviors, personal attack, and stifling autonomy in the context of psychological control may elevate insecurity and frustration (De Kemp et al., 2006) and prevent children from fostering self-regulation, which result in deviant and impulsive behavior, or the willing to take risks and break social norms (Yang et al., 2022). This finding is also consistent with several previous evidence (e.g., Pace et al., 2018; León-del-Barco et al., 2019; Yan et al., 2021).

As for the role of gender on the level of psychological control, we found fathers treated their daughters and sons with similar levels of psychological control. Mothers, on the contrary, appeared to employ higher level of psychological control strategies toward their sons, than their daughters. This result was in line with prior evidence (De Kemp et al., 2006; Endendijk et al., 2016) and provided partial support for the bio-social theory of gender differences (Wood and Eagly, 2002, 2012). Based on this theory, members of the society are exposed to social norms and expectations associated with gender. Parents, peers, and the broader society provide models and cues for what is considered appropriate behavior for boys and girls and how they should be treated differently. In the context of parenting, mothers are encouraged to treat their girls with more gentle and sensitive parenting strategies (Tamis-LeMonda et al., 2009; Mandara et al., 2012), while act with power and assertiveness toward their sons (Kochanska et al., 2009; Tamis-LeMonda et al., 2009). Another underlying factor in this differential treatment might be the bidirectional nature of parental psychological control-child behavior link. Indeed, psychological control may conceivably be driven by child behavior (Larsson et al., 2008). On the other hand, the bio-social theory recognizes that biological factors, such as hormonal differences (e.g., higher levels of testosterone in boys) can contribute to some gender-specific behaviors (including aggression and risk-taking) (Wood and Eagly, 2002, 2012). With this presupposition, one may argue that as boys show higher rate of aggressive and disruptive behavior (Loeber et al., 2013), they have more likelihood to face with higher level of parental psychological control by their mothers-as their first caregiver. However, the gender difference in this study was negligible; thus, for justifying or speculating the probable mechanisms that explain this distinct pattern, the acquisition of further empirical evidence is needed to test the stability and reliability of our results in other cultural backgrounds and to explore the underlying mechanisms driving gender differences in psychological control.

The acceptable discriminant validity of the PCS-YSR was supported through finding the recommended score of AVE (<0.5) for both maternal and paternal forms. This result implies that the variance captured by the construct exceeds the variance due to measurement error, supporting the discriminant validity of the construct and individual indicators (Fornell and Larcker, 1981; Henseler et al., 2015). AVE is also a rigorous test for convergent validity, when comparing it with composite reliability. In case of only taking composite reliability into account (even when more than 50% of variance is explained by error), convergent validity can be considered as sufficient (Voorhees et al., 2016; Kock, 2019).

Limitation, future directions, and implications

Our findings should be interpreted considering some limitations, which can point to promising areas for further investigation. First, we used the self-report measures to collect the present data; specifically, the PCS-YSR only captures the adolescent perception of the parental psychological control. Although measuring this perception is necessary due to its effect on internalizing behavior problems (Brenning et al., 2015; van der Kaap-Deeder et al., 2017), it may also include bias and limit the data's accuracy. Future studies should simultaneously use a multiple-informant approach (including parents', teachers', and

peers' reports) or other measurement tools, such as interviews and real-life observation for assessing parental psychological control. These tools may capture a more comprehensive picture of the parenting practices of Iranian parents. Second, it should be considered that the current study is cross-sectional, so it cannot convey the PCS-YSR's predictive validity. Future studies may be more beneficial if their analysis also focuses on longitudinal studies to examine the bidirectional or reciprocal relationship between parental psychological control and behavior problems during time. Third, our study used a version of the scale that measures the overall parental psychological control, while two types of control, the achievement-oriented and the dependency-oriented psychological control are recently proposed (Soenens et al., 2010). Achievement-oriented psychological control is attributed to the parents' attempt to impose high standards for successful function to their children. Dependency-oriented psychological control is related to the strategies for maintaining the physically and emotionally close relationship with children. Parents might employ one of these types of psychological control based on their characteristics, such as high perfectionism and not having boundaries with other family members (Soenens et al., 2010). Due to their distinctive orientations, these two dimensions of control target different maladjustments. Since dependency-oriented psychological control inevitably stifles the child's independent orientation toward parents, it may exacerbate internalizing problems (Soenens et al., 2012; Gargurevich and Soenens, 2016). On the other hand, achievement-oriented control makes children prone to maladaptive perfectionism due to the pressure they experience to behave ideally (Clark and Coker, 2009). Thus, utilizing this person-oriented approach is important for the future research to specify the parental psychological control's orientation toward achievement or dependency (Soenens et al., 2010), particularly because of their distinctive effect on adolescent's maladjustment.

The present study has three main implications for research and practice. Generally, our results demonstrate that the PCS-YSR is a reliable index of the degree of parental psychological control and possesses capacity to easily screen the adolescents who are psychologically controlled by their parents in clinical context. Specifically, our results provide a wide range of information for family therapists, social workers, teachers, and adolescent psychologists in the Iranian culture. For example, it is documented that parental psychological control is in fact a destructive parenting behavior, linking to youth's behavior problems, that needs to be identified and targeted in child psychology. Another vital finding was the significant impact of gender roles on parental control in Iranian culture, suggesting that such gender differences may be found across cultures, and should be taken into account when targeting parental psychological control by interventions in various contexts.

Conclusion

PCY-YSR is an internationally well-stablished scale to measure the negative aspect of parental control-psychological control. The present findings supported the construct and concurrent validity, reliability, and the gender invariance of the Persian version of PCY-YSR among an adolescent population. Findings of construct validity confirmed the original unidimensional model of the PCY-YSR scale for both mother and father control. Concurrent validity was established through the relationship of PCS-YSR to internalizing and externalizing behavior problem. PCS-YSR proved to be reliable in the current sample and invariant across two dyads of father-son and father-daughter, while different across two dyads of mother-son and mother-daughter. As a concluding remark, the PCY-YSR possesses the psychometric soundness for evaluating perceived parental psychological control among adolescents in Iran.

Data availability statement

The raw data supporting the conclusions of this article can be provided by the corresponding author upon reasonable request.

Ethics statement

The studies involving human participants were reviewed and approved by the Iran University of Medical Sciences (approval code = IR.IUMS.REC.1400.084). Written informed consent to participate in this study was provided by the participants' legal guardian/next of kin.

Author contributions

PS and MH: conceptualization, design, methodology, data collection, investigation, and project administration. BI and MH: formal analysis. MH: supervision. PS, SM, and MH: writing the original draft. PS, ET-C, and MH: revising the draft. All authors have contributed to the conception and design of the study, drafted or revised this manuscript, reviewed the final version of this manuscript before submission, and agreed to be accountable for all aspects of the work.

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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.

The reviewer SS declared a shared affiliation with the authors MH and SM to the handling editor at the time of review.

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The association between authoritarian parenting style and peer interactions among Chinese children aged 3–6: an analysis of heterogeneity effects

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This study explores the effects of authoritarian parenting styles on children's peer interactions, an aspect often overlooked in the existing literature that primarily focuses on family environmental factors. Data was collected through anonymous child-report questionnaires completed by 2,303 parents and teachers of children aged 3–6 years. The findings reveal that (1) authoritarian parenting significantly hinders children's peer interactions; (2) the negative effects of authoritarian parenting differ based on gender, age, and family composition: (a) girls generally exhibit higher peer interactions than boys, with authoritarian parenting having a stronger impact on boys' peer interactions; (b) peer interactions increase significantly with age, and younger children are more susceptible to the negative effects of authoritarian parenting; (c) children with siblings have higher peer interactions, and authoritarian parenting style has a greater influence on their interactions compared to only children. The study discusses potential reasons and provides practical suggestions for families to make informed parenting style choices based on these findings.

KEYWORDS

authoritarian parenting style, peer interactions, social development, gender heterogeneity, age heterogeneity, number heterogeneity

Introduction

Social development plays a crucial role in fostering a well-adjusted personality in children, and the capacity for social support is instrumental in promoting positive psychosocial development, serving as a valuable resource and protective factor. These aspects form the bedrock for establishing positive peer relationships and nurturing physical and mental well-being (Perren et al., 2012; Perren and Diebold, 2017). The quality of peer relationships primarily hinges on children's proficiency in interacting with their peers, serving as a key indicator of their social development (Zhang et al., 2022). Recognizing the significance of physical and mental development in school-age children, along with the paramount importance of education quality, the new round of preschool education reform in China highlights the Guidelines for the Learning and Development of Children Aged 3–6. These guidelines underscore the importance of attending to children's peer interactions, as building positive peer relationships constitutes the initial

step in children's social adaptation and plays a pivotal role in enhancing their mental well-being (Tian, 2019).

Existing research both at home and abroad indicates that individuals with an interdependent self-concept often display collectivist traits. They can maintain a collective equilibrium by adjusting their speech and actions to changing situations, fostering harmonious relationships with their peer group (Zhou et al., 2014). Failing to establish appropriate peer interactions can negatively impact children's social adjustment and interpersonal development in adulthood (Bosacki, 2015). Such adverse peer interactions not only affect children's social development but also increase the risk of depression and autism (Gong and Liu, 2004). Consequently, scholars have increasingly focused on studying children's peer interaction abilities, making it a prominent research area in the field of child sociality (Pang et al., 1997). Consequently, considering the widespread presence of authoritarian family structures in China, coupled with the significant focus on children's peer interactions across various nations, it becomes critically important to investigate the mechanisms through which the authoritarian parenting style influences children's peer interactions in China, and to examine its diverse effects.

Literature review

Parenting styles and children's peer interactions

The formation and development of children's peer interactions are complex and multidimensional. Previous scholars, both domestic and international, have explored the relationship between children's peer interactions and various factors, such as parenting style (Mikami et al., 2010; Ladd and Kochenderfer-Ladd, 2019), teacher-student interactions (Luckner and Pianta, 2011), socio-emotional development (Chen, 2012), and classroom learning (Howe and Mercer, 2007), among other perspectives that encompass multiple domains and dimensions. Parenting style, in particular, plays a fundamental role in children's social development and significantly impacts peer interactions (Hosokawa and Katsura, 2019; Sahithya et al., 2019; Mak et al., 2020). Parenting styles involve varying attitudes and methods parents use in child-rearing (Darling and Steinberg, 1993). Typically, two central facets define parenting techniques: a parent's responsiveness and their level of demands (Lamborn et al., 1991; Villarejo et al., 2023). Responsiveness generally refers to a parent's warmth, active engagement, and support for their child's individuality (Baumrind, 1991; Climent-Galarza et al., 2022). Conversely, demandingness indicates the degree of rigidity and standards parents establish, aligning with societal or household values (Steinberg et al., 1994; Palacios et al., 2022). Given these two dimensions, researchers have identified distinct parenting categories, such as authoritative, authoritarian, neglectful, and indulgent parenting styles (Lamborn et al., 1991; Steinberg et al., 1994; Villarejo et al., 2023).

Cultural nuances can play a pivotal role in shaping the relationship between parenting techniques and child adaptation (Pinquart and Kauser, 2018; Garcia et al., 2019). Some studies have found that parenting styles in Asian contexts, particularly in Pakistan, tend to lean towards an authoritarian approach. Children raised by authoritative parents exhibit elevated levels of aggressive behavior and emotional instability (Anjum et al., 2019). Within the Chinese cultural and social milieu, a child deemed "well-behaved and aware" is often one who has benefitted from effective parental guidance, encompassing both "discipline" and "instruction." Rooted in Confucianism, Chinese moral culture emphasizes patriarchal hierarchies and the virtues of righteousness. Parents might resort to stringent disciplinary actions when children do not meet established standards, seeing this firmness as their duty (Chao, 1994). Such exacting parenting helps the young grasp their place in both family and society, aiding in their seamless assimilation into societal norms (Pan and Shang, 2023). Unlike Western parents, Chinese parents often resort to criticism and directives to achieve their expectations of their children when it comes to raising educated, high-achieving family members. This is especially true in areas like academic achievements and the pursuits of the children, showcasing a distinct authoritarian inclination among Chinese parents (Dornbusch et al., 2016; Ren et al., 2022).

Parenting styles encompass a combination of parenting attitudes, methods, behaviors, and emotional expressions conveyed through parents' responses to their children in daily life, demonstrating cross-situational stability (Darling and Steinberg, 2017). They play a vital role in promoting positive adaptive development (Delvecchio et al., 2020), aligning with Gottman's research on family emotional life (Gottman et al., 1996). Pivotal research conducted in the United States, primarily focusing on middle-class European-American families, has demonstrated that parenting characterized by a blend of demandingness, as observed in the authoritative style, is correlated with psychosocial benefits (Darling and Steinberg, 1993; Steinberg and Morris, 2001). Conversely, a parenting approach that combines demandingness with a lack of responsiveness, characteristic of the authoritarian style, has been linked to significantly adverse outcomes (Darling and Steinberg, 1993; Steinberg, 2001). Children raised under authoritarian parenting tend to experience social impairments, lack social initiative, have difficulty expressing themselves, struggle to form close friendships, and often face rejection by their peers. Recent research conducted in Europe within middle-class family contexts has also established a correlation between the authoritarian parenting style and adverse consequences (Alcaide et al., 2023; Reyes et al., 2023). As a result, children's behavior in peer interactions is rooted in the parenting styles they experience.

However, research on ethnic minority groups in the U.S., including African-Americans and Chinese-Americans, reveals a deviation from the European-American family patterns. Authoritarian parenting in these groups is not always harmful and can be beneficial (Baumrind, 1996; Deater-Deckard et al., 1996; Chao, 2001). Martínez et al. (2021) attribute these differences to varied family perceptions and self-esteem. African-American children under authoritarian parenting might feel familial love and connection, unlike their European-American counterparts, who may feel alienated (Baumrind, 1996; Deater-Deckard et al., 1996). This indicates the effects of authoritarian parenting on children's social behavior vary across cultures. Understanding these parenting styles is crucial for promoting healthy peer interactions and preventing adverse psychological outcomes in children. This study aims to examine the impact of authoritarian parenting on children's peer interactions in Asian cultures, characterized by collectivism and hierarchical relationships, to provide new insights into scientific parenting.

Heterogeneous effects of gender, age and number of children

Firstly, as children grow older, their social cognition improves. They exhibit a decrease in the frequency of forceful displays and aggressive conflicts, and gradually realize the benefits of cooperation and sharing, leading to the establishment of intimate relationships (Green et al., 2008). Older children tend to communicate and comprehend more coherently due to better verbal skills, effectively manage socio-emotional conflicts to reduce social barriers, strengthen their social self-confidence, and foster improved peer interactions. However, children raised under authoritarian parenting styles, characterized by ordering, dictating, and controlling, often demonstrate higher dependency and obedience to their parents, lack assertiveness, exhibit poorer group sensitivity, and have lower psycho-theoretical maturity compared to their peers. They tend to view the self and peers as competitors for achievement (Xu et al., 2013), potentially leading to increased aggression. Conversely, children with strong and dominant personalities may find it challenging to maintain long-term peer relationships and experience higher frequencies of peer alienation (Xu et al., 2008).

Secondly, gender differences play a crucial role in child indicators and the manifestation of variations in child socialization (Wei et al., 2011). The peer socialization model suggests that boys and girls exhibit different patterns of social behavior and types of interaction. Girls tend to focus on smaller-scale interactions and are better at providing intimacy, support, and empathy within their social groups, resulting in higher initial levels of pro-social behavior and better peer interactions compared to boys (Van der Graaff et al., 2018). However, boys raised under authoritarian parenting styles have been found to display higher stress responses to group activities and exhibit more negative and hostile emotions. Their withdrawal in peer interactions increases the risk of social impairment and adherence to organizational rules (Wang and Gai, 2020). Another study found that harsh discipline by fathers significantly predicted internal problem behavior and life satisfaction in sons but not in daughters (Wu et al., 2017). This is because boys' peer groups tend to be larger and engage in rougher play with more physical contact (Wang and Zhuang, 2012).

Thirdly, the one-child family has been the predominant family model in China since the full implementation of the country's family planning policy in 1979 (Hao, 2012). Only children without siblings have been found to have poorer mental health compared to children with siblings. They face a higher risk of suicidal ideation, self-harm during conflicts, and an increased likelihood of drug dependence (Wang et al., 2019). Due to the absence of other sibling subsystems in the family, parental conflicts and family disputes can directly impact the emotional state of the only child (Hao and Feng, 2002). The adoption of an authoritarian parenting style not only hinders the development of only children but also contributes to negative emotions in their peer interactions, fostering competitive, hostile, and aggressive behavior, leading to a decline in the quality of peer relationships (Tippett and Wolke, 2015). Based on these findings, it is evident that the impact of authoritarian parenting style on children's peer interactions is influenced by their age, gender, and family structure. This relationship deserves considerable attention in research on family education and children's social development practices.

Chinese culture and authoritarian parenting style

Given China's unique cultural background, the choice of parenting style and the establishment of peer relationships are geographically specific. Chinese parents place greater emphasis on children's obedience and exert more control over them compared to Western parents (Luo et al., 2013; Ng et al., 2014). Moreover, Asian developing countries, including China, place considerable importance on developing an individual's ability to inhibit emotions and impulses, viewing overexpression of negative emotions or impulsive behavior as a sign of immaturity (Chen et al., 2005). Children are encouraged to exercise self-control, which is considered a sign of achievement, mastery, and maturity in Confucian philosophy (Ho, 1986).

In conclusion, education in the group home is founded on principles of "Tao" and "Art," with a primary focus on fostering comprehensive physical and mental development in children. The approach places particular emphasis on promoting emotional stability and appropriate behavior, which leads to the realization of intrinsic and social values in individuals. In summary, numerous studies have explored the theoretical and empirical aspects of authoritarian parenting style and its impact on peer interactions. However, few studies have delved into the profound effects and heterogeneity of authoritarian parenting style on children's peer interactions during early childhood. To address this gap, the current study aims to investigate the heterogeneous effects of authoritarian parenting style on the peer interactions of 3- to 6-year-old children. The research aims to provide targeted and effective parenting guidance for Chinese family education and raise awareness among families with authoritarian parenting styles about promoting their children's social development while reducing internalization and externalization problems. Based on the aforementioned context, the following hypotheses have been formulated for this study:

> *Hypothesis 1:* Authoritarian parenting style is hypothesized to have a significant negative impact on children's peer interactions.
>
> *Hypothesis 2:* Gender is hypothesized to moderate the effect of the authoritarian parenting style on children's peer interactions.
>
> *Hypothesis 3:* Age is hypothesized to moderate the effect of the authoritarian parenting style on children's peer interactions.
>
> *Hypothesis 4:* Number is hypothesized to moderate the effect of the authoritarian parenting style on children's peer interactions.

Materials and methods

Participants

A total of 2,397 healthy children were recruited from 16 kindergartens, including both public and private ones, located in ten provinces across seven regions in China: North China, East China, South China, Central China, Northwest China, Southwest China, and Northeast China. The recruitment was conducted using stratified and randomized cluster sampling to ensure representative

participation in this study. Questionnaires were distributed to parents and teachers of the participating children, with a total of 2,397 questionnaires successfully recovered, resulting in a 100% recovery rate. However, 94 questionnaires exhibited information mismatch and regularity in the answers and were consequently excluded. As a result, 2,303 valid questionnaires were obtained, corresponding to a questionnaire answer validity rate of 96.08%. Among the participants, 1,180 were boys (51.2%) and 1,123 were girls (48.8%). The age range of the children was from 3 to 6 years, and they were divided into two groups: 1,082 children (47%) in the 3–4 years old group and 1,221 children (53%) in the 4 years old or older group. The children were also categorized based on their kindergarten group size, with 784 (34%) in small groups, 782 (34%) in intermediate groups, and 737 (32%) in large groups. Additionally, 6.8% of the children lived in villages (totaling 157), 93% lived in towns (totaling 2,146), and none lived in cities. Furthermore, 9.8% of the children had divorced parents (totaling 98), while 95.7% had intact families (totaling 2,205). In terms of family structure, 46.4% of families had no second child (totaling 1,068), and 53.6% had a second child (totaling 1,235).

Variables

Independent variable

Authoritarian parenting style was assessed in this study using the Parenting Styles & Dimensions Questionnaire-Short Version (PSDQ-Short Version) (Robinson et al., 2001), which was developed by Robinson et al. The PSDQ-Short Version comprises 12 questions related to authoritarian parenting style. These questions gauge parents' tendencies to display authoritarian behavior and their use of authoritarian practices with their children. This instrument quantifies the extent of authoritarian parenting practices and is completed by all participating parents. For instance, one of the items read, "I would be strict with my child to encourage improvement" (e.g., scolding, criticizing). Respondents rate their agreement on a 5-point Likert scale (1 = never; 5 = always), with higher scores indicating a higher frequency of authoritarian parenting behavior by the parent. The scale has demonstrated robust reliability and excellent psychometric properties when tested with a group of Chinese participants (Li et al., 2012). In this study, the Cronbach's alpha coefficient for the authoritarian parenting style scale was 0.946.

Dependent variable

Peer interactions. In this study, we employed the Peer Interaction Competence Scale for Young Children, developed by Zhang (2002). Several other studies have also utilized this questionnaire (Qin, 2022; Qin and Caizhen, 2022). The scale comprises 24 items that are categorized into four dimensions: social initiative, verbal and non-verbal interactions, social barriers, and pro-social behavior. Teachers completed the questionnaire based on their observations of the children's daily academic and social performances. One of the sample items reads: "Children can organize a group of their peers to work collaboratively in the classroom." A 4-point reverse Likert scale was utilized (1 = not at all, 4 = fully), with higher scores reflecting stronger peer interaction competencies. The overall Cronbach's alpha coefficient for the scale in this study was found to be 0.841, indicating a good level of internal consistency.

Control variables

Considering the cultural variations between different regions, we carefully selected individual and family-level control variables that might have an impact on peer interactions and authoritarian parenting style in children aged 3–6 years. At the individual child level, the control variables included gender (coded as boy = 0), age (coded as 3–4 years = 0), class (coded as 1 = junior class), place of residence (coded as rural = 0), and parental marital status (coded as yes = 0 if parents were divorced). At the child's family level, the control variables encompassed economic conditions, whether the child had a second sibling (coded as no = 0), educational levels of the father and mother, occupations of the father and mother, and the amount of daily time spent with the child by the parents. Table 1 displays the descriptive statistics for all the variables employed in this study.

Research process

Prior to commencing the survey, the researchers sought consent from the local education authority and the participating schools. During the survey, essential information about the school campus was gathered from the principal and teachers. The researchers then provided a clear explanation of the study's objectives and procedures to both parents and teachers before administering the questionnaires. The questionnaires were distributed during parent-teacher meetings conducted in classrooms. Before completing the questionnaires, participants provided written consent and were duly informed about the study's purpose, confidentiality measures, and the guarantee of anonymity. To ensure consistent and accurate instructions, a trained postgraduate student thoroughly explained the study's objectives and guidelines to the participants before they filled out the questionnaires. Following completion, the questionnaires were centrally collected and subjected to thorough verification. All research materials used in this study were thoroughly reviewed and approved by the research ethics committee of the corresponding author's university.

Research analysis

The data were analysed using SPSS version 26.0 and STATA version 16.0 and consisted of four sections.

Firstly, descriptive statistics and bivariate correlations were performed to assess the relationships between the core variables.

Secondly, in analysing the impact of authoritarian parenting style on children's peer interactions, the ordinary least squares (OLS) regression analysis was conducted in this process using a stepwise increase in the number of influencing factors, with the model formula:

$$CA_{\mathrm{i}} = \beta_0 + \beta_1 \rho_i + \sum_{k=1}^{k} \beta_\kappa x_{i\kappa} + \varepsilon_i \qquad (1)$$

where CA_i represents the score of the ith child's peer interactions, ρ_i represents the score of the ith child's authoritarian parenting style, $x_{i\kappa}$ represents the kth control variable, β_0 is the intercept term, β_1 is the coefficient of ρ_i for the authoritarian parenting style, β_κ is the coefficient of the control variable $x_{i\kappa}$, and ε_i is the error term.

Thirdly, Generalised propensity score matching (GPSM) model was used to further identify the relationship between authoritarian

TABLE 1 Measurement description and descriptive statistical analysis of the variables.

Variables	Description	Sample	M	SD	Min	Max
Dependent variable						
Peer interactions	Continuous variable	2,303	2.718	0.407	1	4
Independent variable						
Authoritarian parenting style	Continuous variable	2,303	2.925	0.476	1.17	4.83
Control variables						
Gender	0 = boy; 1 = girl	2,303	0.488	0.500	0	1
Age	0 = 3–4 years old; 1 = 4–6 years old	2,303	0.530	0.499	0	1
Class	1 = junior class, 2 = middle class, 3 = top class	2,303	1.980	0.813	1	3
Residence	0 = rural; 1 = urban	2,303	0.932	0.252	0	1
Parental marital status	0 = yes; 1 = no	2,303	0.957	0.202	0	1
Family economic conditions	1 = very difficult, 2 = relatively difficult, 3 = moderate, 4 = relatively wealthy, 5 = very wealthy	2,303	3.723	1.051	1	5
Number of children	0 = one child; 1 = more than one child	2,303	0.536	0.499	0	1
Father's education	1 = below junior high school, 2 = high school/middle school/vocational high school, 3 = college, 4 = bachelor's degree, 5 = master's degree and above	2,303	3.529	1.005	1	5
Mother's education	1 = below junior high school, 2 = high school/middle school/vocational high school, 3 = college, 4 = bachelor's degree, 5 = master's degree and above	2,303	3.535	0.972	1	5
Father's occupation	0 = Managerial (state agencies/institutions) or technical (teachers/engineers/doctors/lawyers); 1 = Other occupations	2,303	0.436	0.496	0	1
Mother's occupation	0 = Managerial (state agencies/institutions) or technical (teachers/engineers/doctors/lawyers); 1 = Other occupations	2,303	0.449	0.497	0	1
Time spent with the child	1 = 1 h or less, 2 = 1 to 3 h, 3 = 3 to 5 h, 4 = 5 h and above	2,303	3.294	0.875	1	4

parenting style and children's peer interactions. And the robustness of OLS was tested based on the estimation of GPSM with the model equation:

$$E\left(\Upsilon_i \setminus T_i, \widehat{\mathcal{R}}_i\right) = \alpha_0 + \alpha_1 T_i + \alpha_2 \widehat{\mathcal{R}}_i + \alpha_3 T_i \widehat{\mathcal{R}}_i \quad (2)$$

where the treatment variable T is authoritarian parenting style and the outcome variable Υ is peer interactions. Firstly, the conditional probability density distribution of the treatment variable T is estimated by GPSM based on the given covariates X, and the generalised propensity score $\mathcal{R}$ is obtained. Therefore, the two factors that affect both the treatment variable and the outcome variable: the child and the family are selected as covariates. Then, by constructing an OLS regression model with the treatment variable T and the generalised propensity score $\mathcal{R}$, the conditional expectation of the outcome variable Υ was calculated and the coefficients $\alpha_0 \sim \alpha_3$ were obtained. Finally, the range of values of the treatment variable T was divided into a number of equally spaced consecutive intervals, and based on the α coefficients obtained in the previous step, the average treatment effect (ATE) of T was estimated within each interval (Chen et al., 2014).

Fourthly, the sample data were divided according to gender, age and number of children, and the Fisher permutation test (FP) was used to explore whether the results of the effect of authoritarian parenting styles on peer interaction skills varied according to gender, age and number of children.

Results

Common method bias test

All data in this study were collected through self-reports from both parents and teachers, potentially introducing common method bias. To address this concern, Harman's one-factor test (Zhou and

Long, 2004) was conducted. The results indicated the presence of four factors, each with an eigenvalue greater than 1. However, the first common factor accounted for only 21.027% of the variance, which was below the critical threshold of 40%. Consequently, it was concluded that there was no significant common method bias affecting the study.

The impact of authoritarian parenting styles on peer interactions

Prior to conducting the Ordinary Least Squares (OLS) regression analysis on authoritarian parenting style and peer interactions, a multiple covariance test was conducted on models (1), (2), and (3). Based on the parents' responses to the questionnaire, the maximum variance inflation factors for models (1), (2), and (3) were 1.00, 2.01, and 5.82, respectively, all of which were below the threshold of 10. These findings indicated the absence of significant multicollinearity issues in models (1), (2), and (3), allowing them to be subjected to OLS regression analysis.

To enhance the scientific validity and reliability of the regression results, multiple adjusted regressions were employed to analyze the impact of authoritarian parenting style on peer interactions by gradually incorporating additional influencing factors (Equation 1). Model (1) only included the core variable of authoritarian parenting style. Model (2) introduced individual child characteristics as a dimension variable in addition to the core variable from model (1). Finally, based on model (2), model (3) included family characteristics as dimension variables (refer to Table 2). The testability index (Table 2) illustrates that as stepwise regression progresses, the models progressively incorporate more factors that affect peer interactions, resulting in an increase in the R^2 values to 0.325, 0.414, and 0.420, respectively. This indicates that the models are well-constructed, and the inclusion of children's individual characteristics and family characteristics contributes to a more comprehensive explanation of children's peer interactions. In each of the models (1), (2), and (3), the estimated coefficients of authoritarian parenting style passed the 1% significance test, and all exhibited negative signs. This suggests that authoritarian parenting style significantly and adversely affects children's peer interactions. Thus, *Hypothesis 1* is validated.

TABLE 2 Results of the OLS benchmark regression on the effect of authoritarian parenting style on peer interactions.

Variables	(1) Peer interactions	(2) Peer interactions	(3) Peer interactions
Authoritarian parenting style	−0.487*** (0.015)	−0.245*** (0.020)	−0.225*** (0.020)
Gender		0.145*** (0.016)	0.143*** (0.016)
Age		0.252*** (0.018)	0.249*** (0.018)
Class		−0.007 (0.008)	−0.008 (0.008)
Residence		0.058** (0.026)	0.055** (0.028)
Parental marital status			0.034 (0.036)
Family economic conditions			0.000 (0.015)
Number of children			0.061*** (0.014)
Father's education			−0.018** (0.009)
Mother's education			0.017* (0.009)
Father's occupation			−0.004 (0.031)
Mother's occupation			−0.005 (0.015)
Time spent with the child			0.009 (0.007)
Sample	2,303	2,303	2,303
R^2	0.325	0.414	0.420

*$p < 0.1$, **$p < 0.05$, ***$p < 0.01$. The robust standard errors are in parentheses.

A robustness test of the effect of authoritarian parenting style on peer interactions: an estimation based on the GPSM

Due to the non-normal distribution of the independent variable, authoritarian parenting style from the parent-completed questionnaires, it was standardized within the range of [0,1]. Subsequently, the fractional logit model was employed to estimate the conditional probability density of treatment intensity (Equation 2). The results indicated that the fractional logit model demonstrated a good fit, as evidenced by the Akaike Information Criterion (AIC) value of 0.910. Among the selected control variables, child gender, child age, and whether the family had a second child exhibited the highest regression coefficients for authoritarian parenting style, surpassing other variables significantly. Furthermore, all three variables passed the 1% significance test, signifying their substantial impact on authoritarian parenting style (refer to Table 3).

The dose–response plots of authoritarian parenting style (Figure 1) demonstrated a significant decrease in the level of peer interactions as the level of authoritarian parenting style increased, even after controlling for GPSM. This indicates a consistent and robust negative correlation between authoritarian parenting style and peer interactions, which aligns with the findings of the previous OLS regression analysis, reaffirming the strong impact of authoritarian parenting style on peer interactions.

TABLE 3 Fractional logit regression results for authoritarian parenting style.

Variables	
Gender	−0.325*** (0.015)
Age	−0.542*** (0.015)
Class	0.111*** (0.010)
Residence	0.015 (0.031)
Parental marital status	0.026 (0.037)
Family economic conditions	0.034* (0.019)
Number of children	−0.166*** (0.015)
Father's education	−0.010 (0.011)
Mother's education	−0.010 (0.011)
Father's occupation	0.052 (0.037)
Mother's occupation	0.032* (0.017)
Time spent with the child	0.027*** (0.009)
Sample	2,303
AIC	0.910

*$p<0.1$, **$p<0.05$, ***$p<0.01$. The robust standard errors are in parentheses.

Heterogeneity in the effects of authoritarian parenting style on peer interactions: based on the gender dimension of children

First, the baseline OLS regression results for model (3) in Table 2 reveal that child gender has a coefficient of 0.143 ($p<0.001$) in the association between authoritarian parenting style and peer interactions. Secondly, models (1) and (2) in Table 4 display the OLS regression results for the impact of authoritarian parenting style on peer interactions separately for boys and girls. In both cases, the estimated coefficients are statistically significant at the 1% level with negative signs. Notably, the absolute value of the regression coefficient for authoritarian parenting style on boys' peer interactions (−0.271) is larger than that for girls' peer interactions (−0.193). Furthermore, the results of Fisher's exact test for the difference in gender coefficients concerning the effect of authoritarian parenting style on peer interactions are significant at the 5% level. These findings indicate that overall, girls' peer interactions are higher than those of boys. Moreover, there is a gender heterogeneity effect in the relationship between authoritarian parenting style and peer interactions, with the effect of authoritarian parenting style on boys' peer interactions being more pronounced compared to girls. As a result, *Hypothesis 2* is confirmed.

Heterogeneity in the effects of authoritarian parenting style on peer interactions: based on the age dimension of children

Firstly, the baseline OLS regression results for model (3) in Table 2 reveal a coefficient of 0.249 ($p<0.001$) for children's age in the relationship between authoritarian parenting style and peer interactions. Secondly, models (1) and (2) in Table 5 present the OLS regression results for the effect of authoritarian parenting style on peer interactions for two age groups: 3–4 years old and 4–6 years old, respectively. In both

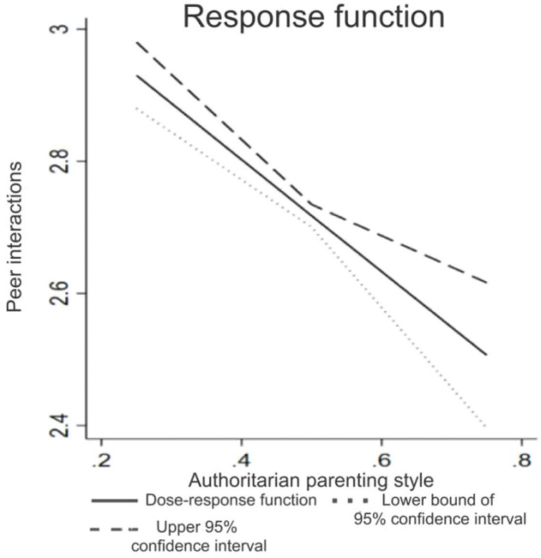

FIGURE 1
Effects of authoritarian parenting style on peer interactions.

TABLE 4 Effects of authoritarian parenting style on peer interactions: gender differences.

Variables	(1) Peer interactions	(2) Peer interactions
	Boys	Girls
Authoritarian parenting style	−0.271*** (0.035)	−0.193*** (0.023)
Control variables	Yes	Yes
Sample	1,180	1,123
R^2	0.313	0.245
Fisher empirical p value	0.022**	

(1) *$p < 0.1$, **$p < 0.05$, ***$p < 0.01$. The robust standard errors are in parentheses. (2) The Fisher empirical p value is used to test the significance of the coefficient difference between the groups, which was obtained by 5,000 self-sampling times.

TABLE 5 Effects of authoritarian parenting style on peer interactions: age differences.

Variables	(1) Peer interactions	(2) Peer interactions
	3–4 years old	4–6 years old
Authoritarian parenting style	−0.292*** (0.033)	−0.177*** (0.025)
Control variables	Yes	Yes
Sample	1,082	1,221
R^2	0.248	0.132
Fisher empirical p value	0.000***	

(1) *$p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. The robust standard errors are in parentheses. (2) The Fisher empirical p value is used to test the significance of the coefficient difference between the groups, which was obtained by 5,000 self-sampling times.

cases, the estimated coefficients are statistically significant at the 1% level with negative signs. Notably, the absolute value of the regression coefficient for authoritarian parenting style on peer interactions for children aged 3–4 years (−0.292) is greater than that for children aged 4–6 years (−0.177). Additionally, the empirical p-value of Fisher's exact test for the variability of the age coefficient concerning the effect of authoritarian parenting style on peer interactions is significant at the 1% level. These findings indicate that the level of peer interactions significantly increases with age among children aged 3–6 years. Moreover, there is a child age heterogeneity effect in the relationship between authoritarian parenting style and peer interactions, with the effect of authoritarian parenting style on peer interactions being more pronounced among children aged 3–4 years compared to children aged 4–6 years. Thus, *Hypothesis 3* is supported.

Heterogeneity in the effects of authoritarian parenting style on peer interactions: based on the number dimension of children

Firstly, the baseline OLS regression results for model (3) in Table 2 reveal a coefficient of 0.061 ($p < 0.001$) for the number of children in the family in the relationship between authoritarian parenting style and peer interactions. Secondly, models (1) and (2) in Table 6 present the OLS regression results for the effect of authoritarian parenting style on peer interactions for two groups: children without a second child in the family and children with a second child in the family, respectively. In both cases, the estimated coefficients are statistically significant at the 1% level with negative signs. Notably, the absolute value of the regression coefficient for authoritarian parenting style on peer interactions for children without a second child in the family (−0.300) is larger than that for children with a second child in the family (−0.168). Additionally, the empirical p-value of Fisher's exact test for the variability of the number coefficients concerning the effect of authoritarian parenting style on peer interactions is significant at the 1% level. These findings indicate that children with a second child in the family have significantly more peer interactions than children without a second child in the family. Furthermore, there is a heterogeneous effect of the number of children on the relationship between authoritarian parenting style and peer interactions, with the effect of authoritarian parenting style on peer interactions being more pronounced among children without a second child in the family compared to those with a second child in the family. Thus, *Hypothesis 4* is supported.

TABLE 6 Effects of authoritarian parenting style on peer interactions: number differences.

Variables	(1) Peer interactions	(2) Peer interactions
	Without a second child	With a second child
Authoritarian parenting style	−0.300*** (0.032)	−0.168*** (0.024)
Control variables	Yes	Yes
Sample	1,068	1,235
R^2	0.388	0.357
Fisher empirical p value	0.000***	

(1) * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. The robust standard errors are in parentheses. (2) The Fisher empirical p value is used to test the significance of the coefficient difference between the groups, which was obtained by 5,000 self-sampling times.

Discussion

Negative effects of authoritarian parenting style on peer interactions of 3–6 years old children

The current study has revealed a significant negative predictive effect of authoritarian parenting style on children's peer interactions, which aligns with family systems theory and is consistent with previous research involving children and early adolescents (Chan et al., 2018; Obimakinde et al., 2019; Zhu et al., 2021). During the child's interactions with their parents, they observe and imitate the verbal and emotional expressions of family members, and they perceive the reactions of individuals to various stimuli. Consequently, when confronted with relevant situations during group interactions, children draw on the

information they have absorbed from their parents to respond in a similar manner, mobilizing their own emotions and executive capabilities. Authoritarian parents' attitudes are characterized by a lack of respect for their children's opinions and excessive discipline, with limited feedback, encouragement, and approval. This consistent imposition of unreasonable demands gradually erodes the child's personality development and reinforces negative parent–child interaction experiences (Liu and Feng, 2023). Over time, this parent–child dynamic can affect the child's normal responses in peer interactions, rendering them susceptible to intense emotions and aggressive behavior, leading to victimization by peers.

In systems theory, the peer connections of children are seen as a unique system, heavily influenced by family dynamics. The characteristics and behavior patterns within a family, especially those of authoritarian parents, greatly shape children's interactions with peers (Brown and Bakken, 2011). Children exposed to authoritarian parenting often misinterpret peer actions as hostile, which leads to their alienation and possibly to their withdrawal from social groups (Ros and Graziano, 2018). This social impairment places them at risk of isolation from their peers. Furthermore, in the absence of social support, children might resort to rumination instead of seeking coping mechanisms to handle stress or negative emotions. This can increase their likelihood of developing depressive tendencies (Nolen-Hoeksema, 1991). Authoritarian parenting, characterized by low warmth and high punitive demands, can have detrimental effects on children both at the group and individual levels. High levels of parental authoritarianism correlate with more problematic peer interactions, poor social relationships, and negative social interaction patterns. In structured group settings, some children may react to the restrictive nature of authoritarian parenting by violating established norms or by becoming socially withdrawn and "invisible" to their peers. Both outcomes hinder the development of positive peer interactions, negatively affecting children's physical and mental well-being and impeding their social development.

Heterogeneous effects of authoritarian parenting style on children's peer interactions

This study also revealed heterogeneous effects of gender, age, and the number of children on the negative impacts of authoritarian parenting style on children's peer interactions.

Firstly, research indicates that girls generally have more peer interactions than boys, influenced by the authoritarian parenting style, which affects boys more significantly. This disparity aligns with Social Role Theory (Eagly, 2013), suggesting societal expectations and gender roles shape emotional and behavioral development. Girls often show obedience, while boys demonstrate assertiveness and defiance, reflecting societal teachings of gender-specific traits (Eagly, 2009). Children internalize these gender characteristics, influencing their focus and processing of gender-related information (Hilt et al., 2010). In peer interactions, girls prioritize relationships and support, using positive strategies during conflicts, thus promoting prosocial behavior (Jahromi et al., 2021). Boys, conversely, focus on game-related emotions, prefer temporary group dynamics, and may resort to aggressive conflict resolution, often exacerbating peer issues. These patterns suggest the need for parental awareness of children's peer interaction styles, especially among boys, where negative interactions and behaviors are more prevalent.

Secondly, the study's findings revealed a significant increase in the level of peer interactions among children aged 3–6 years with advancing age. Additionally, the impact of authoritarian parenting on peer interactions was found to be more pronounced among children aged 3–4 years compared to those aged 4–6 years, which aligns with previous research (Zheng, 2018). Physiologically, the prefrontal lobe of a child's brain undergoes gradual development alongside physical growth. This brain region plays a vital role in emotion regulation and behavioral inhibition, directly influencing children's emotional responses and controlling their externalized behaviors. The findings of this research align with Gottman's emotion-centric perspective on parenting approaches and offer insights into discerning if children exhibit positive or negative emotional inclinations (Jespersen et al., 2021). Moreover, the developmental theory of group socialization (Saara, 1951) posits that as children grow older, the proportion of their participation in peer groups significantly increases. Interactions in diverse social situations continually complement and fulfill children's intrinsic needs for social engagement (Li, 2004). Consequently, their repertoire of peer interaction strategies becomes more varied (Elenbaas, 2019; Ladd and Kochenderfer-Ladd, 2019), and they develop logical thinking when selecting interaction modes that align with the rules of the organization. With reduced dependency on the family for defining their social interactions and values (Sümer et al., 2019), they are more likely to develop self-validation and empathy for others, acquire positive peer interactions, and establish meaningful peer relationships.

Finally, the study's findings also revealed that children with a second child in the family had significantly higher levels of peer interactions than children without a second child in the family. Moreover, authoritarian parenting style had a stronger impact on peer interactions for children without a second child in the family compared to those with a second child, consistent with a previous study (Cameron et al., 2013). In terms of family structure, children without a second child in the family bear the sole burden of family conflicts and the authoritarian control of their parents (Liu et al., 1988). This unique role may foster individualistic characteristics or an independent self-concept, making them assertive, but also prone to neglecting the feelings and needs of their peers. They may seek to impose their own expectations and achieve personal goals by altering external conditions, exhibiting a strong sense of self and independence. Consequently, in group settings, they may become demanding or even bullies, seeking the initiative and leadership that may be lacking at home and displaying emotional outbursts and problem behaviors that are rejected by their peers. From the perspective of the "erosion-convergence" theory of the dynamics of social influence, the differences in children's psychological and behavioral outcomes are rooted in variations in family environment and parenting styles. Thus, in light of the recent opening of the three-child policy in China, further comparative investigations and in-depth probes into the effects of different family structures on children's development are necessary to contribute to the advancement of scientific family and pre-school education.

Conclusion

After controlling for child- and family-related variables, the results of this study indicate that authoritarian parenting style is negatively correlated with peer interactions. There is gender, age, and number heterogeneity in the negative effects of authoritarian parenting style on children's peer interactions: (a) Girls' overall peer interactions are higher than boys', and authoritarian parenting has a stronger impact on boys' peer interactions than on girls. (b) Peer interactions among children aged 3 to 6 increase significantly with age, and authoritarian parenting style has a more pronounced effect on peer interactions of 3- to 4-year-olds than on those of 4- to 6-year-olds. (c) Peer interactions are significantly higher for children with a second child in the family than for only children, and authoritarian parenting style has a greater impact on peer interactions for children with a second child in the family than for only children. The implications of these findings are threefold: Firstly, it offers targeted and effective parenting advice for family education. Secondly, this study's findings contribute to the expansion of family research into a broader international context. By exploring the nuances of family cultures in various countries, we aim to assimilate the most effective aspects of each. Thirdly, the observed diversity in parenting styles across different socioeconomic classes in various countries underscores the need for future research. Such studies could perform in-depth analyses of the relationship between children's parenting styles, their peer interactions, and socioeconomic class.

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 the Ethics Committee Review Board of Liaoning Normal University. The studies were conducted in accordance with the local legislation and institutional requirements. The participants provided their written informed consent to participate in this study.

Author contributions

DL: Writing – original draft, Writing – review & editing. WL: Conceptualization, Data curation, Formal analysis, Methodology, Software, Writing – original draft, Writing – review & editing. XZ: Formal analysis, Methodology, Software, Supervision, Writing – original draft, Writing – review & editing.

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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.

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Corporal punishment and violent behavior spectrum: a meta-analytic review

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Corporal punishment is believed to precede various forms of violent behavior, yet prior research has yielded inconsistent findings, partly due to variations in violent types and other factors. This meta-analysis systematically reviewed 35 studies including 144 effect sizes (comprising a total sample size of 159,213) investigating the association between corporal punishment and a spectrum of violent behaviors called Violent Behavior Spectrum (VBS). Additionally, meta-regressions were conducted to explore the moderating impact of punishment severity, violence type and cultural context. Our findings indicated a significant positive relationship between corporal punishment and VBS ($r = 0.238$, 95%, CI [0.176, 0.300]). Notably, punishment severity was found to influence the strength of this association. Namely, The more severe the corporal punishment, the more likely it is to lead to VBS. These results enhance our understanding of the intricate connection between corporal punishment and various forms of violence, providing valuable insights for both parenting practices and policy development.

KEYWORDS

corporal punishment, violent behavior spectrum, meta-analysis, children, VBS

1 Introduction

The Violent Behavior Spectrum (VBS), referring to the range of violent behavioral manifestations along a continuum of severity, poses critical implications for psychology, criminology, and policymaking (Huesmann, 2018). Elucidating factors underlying VBS is vital for illuminating etiology and informing interventions and policies, particularly regarding the connection between corporal punishment and violence (Durrant and Ensom, 2012). Considerable research has examined potential links between corporal punishment and aggressive behaviors (Gershoff, 2002). However, studies predominantly focused on aggression, with limited exploration of the VBS continuum. Moreover, past studies did not distinguish clearly between aggression and violence, obstructing examination of VBS associations (Larzelere, 1996). Finally, the relationship between corporal punishment and VBS remains ambiguous, with evidence both affirming and refuting associations (Straus, 1997; Larzelere, 2000). These inconsistencies likely stem from variations in punishment severity and violent types or other potential moderators. Therefore, a focused meta-analysis quantitatively synthesizing the literature on corporal punishment and VBS is essential.

1.1 Defining and measuring corporal punishment

Definitions of corporal punishment differ across studies. This analysis adopts an inclusive definition of corporal punishment as disciplinary tactics leveraging mild pain to punish misbehaviors (Straus, 1997). Common forms include spanking, slapping, and ear pulling without significant injury. Based on severity, corporal punishment ranges from mild to severe (Larzelere, 2000). The primary distinction between corporal punishment and abuse involves the harm inflicted, with discipline as the former's aim and anger expression as the latter's purpose. Consequently, experiencing abuse versus corporal punishment may yield divergent outcomes (Gershoff, 2002). The relationship between abuse and violence has achieved relatively consistent conclusions. However, the association between corporal punishment and various violence forms remains contentious (Larzelere, 2000). Hence, this analysis focuses on the association between corporal punishment and diverse violence types, excluding studies on parental abuse.

Precisely measuring corporal punishment requires established tools like the Corporal Punishment History Scale and the Conflict Tactics Scale (Smith et al., 2015; Lorber and Slep, 2018). The Corporal Punishment History Scale collects individuals' frequency of receiving parental corporal punishment during growth through questionnaire surveys. The Conflict Tactics Scale asks in detail about various disciplinary strategies used by parents in education to assess the use of corporal punishment. Both scales have good reliability and validity and are the main tools for assessing corporal punishment experience in current research.

1.2 Defining and measuring violent behavior spectrum

The Violent Behavior Spectrum (VBS) refers to a comprehensive framework encompassing a continuum of behaviors characterized by varying violence or aggression degrees (Sánchez-Sansegundo et al., 2020). The spectrum ranges from minor acts like verbal disputes and property destruction to severe acts like armed assault and homicide (Brent, 2011). VBS emerged as an integrative model recognizing violence's multidimensional nature beyond dichotomous classification into aggression presence or absence (Patrick and Drislane, 2015). This conceptualization enables studying factors influencing violence risk across the full severity spectrum. This analysis includes externalizing problems, antisocial behavior, all aggression types, all violence types, and violent crime in the VBS. Although distinct, studying antisocial and violent behavior under the unified VBS framework has merit. First, some antisocial acts involve violence. Second, both can infringe upon others' rights and well-being. Third, robust violence research provides theoretical models and methodological tools elucidating antisocial behavior mechanisms and management. Fourth, similar developmental and socio-environmental factors may underlie both behaviors' manifestation (McCord, 1988). Research on the two behaviors can thus advance understanding of individual variations and inform prevention and correctional programs.

The VBS can be assessed through various quantitative and qualitative methods. Self-report tools and behavioral observations document violent acts directly, while official crime and arrest records provide objective severe violence data. Implicit measures like the Weapons Identification Task gage automatic violence associations (Bushman, 2018). Qualitative interviews can elucidate subjective violence perpetration experiences. A multi-method approach combining self-reports, observations, convictions records, and implicit tests enables robust VBS measurement across the continuum (Jacques and Wright, 2008; Sánchez-Sansegundo et al., 2020).

Established instruments assess VBS dimensions. The Buss-Durkee Hostility Inventory measures violence-proneness through subscales like assault and indirect hostility Established instruments assess VBS dimensions. The Buss-Durkee Hostility Inventory measures violence-proneness through subscales like assault and indirect hostility (Buss and Durkee, 1957). The Lifetime Assessment of Violent Acts captures severe violent offenses (Flannery et al., 2007). Governmental criminal records provide objective individual arrest and conviction data (McCord, 1988). Selecting suitable tools and employing them in combination enhances the measurement of VBS (Coccaro et al., 1997).

1.3 Theoretical perspectives

Theoretical perspectives offer differing propositions on corporal punishment's impacts on the VBS. Social learning theory posits corporal punishment can propagate aggressive tendencies by modeling and reinforcing violence, potentially elevating VBS risk (Bandura, 1978). In contrast, control theories propose that non-abusive discipline promotes self-regulation and socialization, suggesting moderate corporal punishment may not increase VBS risk (Gottfredson and Hirschi, 1990). Attachment theories highlight secure caregiver attachment may buffer corporal punishment's effects on VBS (Sroufe, 2005). Additionally, general aggression models posit frequent corporal punishment use fosters an externalizing cognitive lens toward relationships that feeds into VBS (Huesmann and Kirwil, 2007).

The theory of social moral development posits that morality should not merely be understood as a set of behavioral rules but rather as a mechanism regulating societal relationships. Morality is defined as an interactive process between individuals and social phenomena, shaped by their societal connections (Kohlberg, 1976; Emler, 1987). Reward and punishment constitute fundamental means through which adults intervene when moral norms are being upheld or transgressed (Eriksson et al., 2017; Ziv et al., 2021). Thus, when employed to uphold moral standards within certain parameters, corporal punishment may not necessarily escalate subsequent aggressive behavior.

Understanding this relationship is particularly crucial for child development as children are sensitive to social norms (McAuliffe et al., 2017). Moreover, children's comprehension of corporal punishment influences its link with aggression. Research illustrates children aged 5–9 prefer withdrawing from unfair individuals over punishing them (Lee and Warneken, 2020). Recent findings reveal 21-month-olds expect bystanders to engage in third-party punishment of antisocial agents (Geraci, 2021; Geraci and Surian, 2021). Conceptualizing punishment of aggression and rewards for prosocial acts as means to maintain order, children likely endorse such measures, thereby mitigating potential adverse outcomes like aggression. Overall, theoretical corporal punishment and VBS links require further empirical investigation.

1.4 Previous empirical research

Empirically, considerable research reveals a positive association between corporal punishment and aggressive behavior (Gershoff, 2002). However, some studies indicate moderate corporal punishment does not increase child aggression (Larzelere, 1996). A meta-analysis concluded corporal punishment predicts higher childhood aggression regardless of baseline levels (Gershoff and Grogan-Kaylor, 2016). Evidence indicates a dose–response relationship, with more frequent corporal punishment linked to greater aggression (Taylor et al., 2017). Conclusions are mixed regarding links between corporal punishment and specific violent motives. Moreover, the longitudinal impacts of childhood corporal punishment on adult violent criminality along the spectrum remain underexplored (Afifi et al., 2017). The correlation between corporal punishment and aggression may vary compared to its associations with other violent behaviors like bullying, violence, and violent crime (Zhu et al., 2017). Further research should elucidate the nuances between corporal punishment and the multidimensional VBS construct.

1.5 Potential moderators

The associations between corporal punishment and VBS may influenced by potential moderating factors. The strength and intensity of this relationship are susceptible to the nuanced influences of intervening variables, including the severity of punishment (Larzelere, 1996; Gershoff, 2002) and the specific category of behavior within the violent behavior spectrum. Firstly, the severity of punishment emerges as a pivotal factor influencing the association between corporal punishment and the violent behavior spectrum. Distinct levels of corporal punishment may yield divergent impacts on violent behavior. For instance, mild corporal punishment might only contribute to an escalation of violent tendencies, while severe corporal punishment could be more prone to eliciting actual acts of violence. Consequently, considering the intensity and frequency of corporal punishment is imperative in any analysis. Secondly, the specific category within the violent behavior spectrum emerges as yet another possible moderating variable. The violent behavior spectrum encompasses a wide array of behaviors, ranging from less severe acts like verbal disputes to more extreme acts like armed assaults and homicide. The impact of corporal punishment on an individual's behavior within this spectrum may diverge substantially based on the particular category of violent behavior under consideration.

Other factors that might impose influence on corporal punishment-VBS include developmental stage (Steinberg, 2009), publication year, culture (Lansford et al., 2005), gender, and measurement tools. Given the absence of a comprehensive integrated framework for these factors, this study seeks to investigate them in an exploratory fashion, aiming to comprehend their possible functions in moderating the relationship between corporal punishment and VBS.

1.6 Previous meta-analyses and current study

Several influential meta-analyses have examined the relationship between corporal punishment and child outcomes. Gershoff conducted pioneering research differentiating corporal punishment from abuse and aggression from criminal behaviors (Gershoff, 2002; Gershoff and Grogan-Kaylor, 2016). Findings indicated children subjected to corporal punishment exhibit higher aggression and antisocial tendencies, with impacts potentially extending into adulthood. Utilizing updated techniques, replicated and expanded upon this earlier meta-analysis, further substantiating the negative sequelae of corporal punishment (Gershoff and Grogan-Kaylor, 2016). However, Larzelerea and Kuhn discovered in their meta-analysis that the potential negative impacts of corporal punishment on children hinge on the severity of the punishment and contextual factors (Larzelere and Kuhn, 2005). Mild corporal punishment, under certain circumstances, may prove to be an effective disciplinary strategy. Paolucci and Violato collected 70 empirical studies to explore the relationship between corporal punishment and children's negative affect, behavior problems, and cognition development (Paolucci and Violato, 2004). The research found that corporal punishment had no significant impact on cognition development, only small negative impacts on negative affect ($r = 0.20$) and behavior problems ($r = 0.21$). The study also called for further in-depth research on potential moderating variables. To get closer to the causal relationship, Ferguson's meta-analysis solely included longitudinal studies and found weaker correlations between corporal punishment and aggression, antisocial behavior, and cognitive deficits (Ferguson, 2013). This meta-analysis indicated harsh punishment poses greater risk, while mild corporal punishment may not correlate with child problems. Ferguson suggested corporal punishment effects are context-dependent and prohibition may be unwarranted (Ferguson, 2013). In summary, these meta-analyses found inconsistent results, which necessitate further meta-analytic exploration due to the inconsistencies.

While informative, contradictions in prior findings reveal gaps regarding the contexts and mechanisms linking corporal punishment to violent outcomes. The present study aims to contribute uniquely to the literature by comparing corporal punishment effects on a spectrum of aggressive behaviors, from bullying to criminality. Additionally, factors moderating this relationship require clarification. By addressing limitations and integrating previous evidence, the current research tries to provide perspectives to inform practices and policies around parenting and violence prevention. Our central hypothesis is that there is a positive correlation between corporal punishment and the violent behavior spectrum.

2 Method

The literature search for this meta-analysis was conducted following PRISMA reporting guidelines for the final report (Page et al., 2021). Electronic databases, including PubMed, PsycINFO, Proquest and Web of Science were searched using a combination of keywords and Boolean operators. The search strategy was designed to include studies published between 1950 and 2023, and it focused on the following key terms: (Corporal punishment or physical punishment or spanking or beating or caning or flogging or hitting or smacking or Strict parenting or Coercive parenting or Punitive discipline or Harsh discipline) and (Violent crime or Violent offense or Crime of violence or Violent act or Violent behavior or Aggressive crime or Violent conduct or Violent delinquency or Violent

wrongdoing or Violent transgression). In addition to electronic databases, a manual search of relevant journals, conference proceedings, and reference lists of identified studies was performed to ensure completeness (Cooper and Patall, 2009).

Studies were considered eligible for inclusion in this meta-analysis based on the following criteria: (a) Population: Studies involving participants from the general population and criminal offenders were included. (b) Study design: Empirical studies that examine corporal punishment and violent crime and report valid effect sizes or other statistical metrics that can be converted into effect sizes were included. (c) Publication Status: Published articles, conference abstracts, and unpublished dissertations or theses were all eligible for inclusion. (d) Language: Studies published in English were included. Studies were excluded if they did not meet the above inclusion criteria or if they were duplicates. Individuals with mental disorders and various types of clinical samples were also excluded. Two independent authors screened the retrieved studies for eligibility, and any discrepancies were resolved through discussion or consultation with a third author (Buscemi et al., 2006).

2.1 Data extraction and coding

The coding procedures for this meta-analysis involved the selection of relevant variables and the extraction of data from the included studies. Two independent coders were responsible for the coding process, and discrepancies were resolved through discussion and consensus (Castillo-Montoya, 2016). The details of coding are as follows: (a) Study characteristics: Information was extracted regarding each study's authors, publication year, and research design. (b) Sample characteristics: Data were recorded (Lipsey and Wilson, 2001) related to sample size and demographics such as age, gender, and cultural background. Sample gender was coded as the percentage of females. Sample age was coded categorically based on participants' age range. Samples with a mean age below 13 years were coded as "child" (ch). Samples with a mean age below 19 years were coded as "adolescent" (ad). Samples with a mean age of 19 years or above were coded as "adult" (al). Sample cultural background was coded into East and West categories based on geographical proximity and cultural commonalities. China and Korea were classified as East (e). The United States, Spain, Germany, Canada, and Poland were classified as West (w). (c) Effect sizes: the Pearsons' r was utilized as the primary effect size metric to assess the strength and direction of relationships between variables. Effect sizes were extracted from studies. If unavailable, they were calculated from reported statistics (e.g., means, standard deviations, sample sizes) using validated methods (Wilson, 2001). (d) Corporal punishment severity: Corporal punishment severity was categorized into three levels based on the injury inflicted (physically and psychologically)- low-level corporal punishment (LCP), medium-level corporal punishment (MCP), and high-level corporal punishment (HCP). LCP incorporated less than one instance of spanking, deprivation of privileges, inductive discipline, and mild forms. MCP involved more than two instances of spanking, power-assertive techniques, penalty tasks, lax or reactive approaches, verbal punishment, caning, and slapping. Finally, HCP included psychological aggression, harsh corporal punishment, and punitive discipline (Larzelere, 2000). (e) VBS type: VBS type was categorized into four categories based on the severity of VBS, from low to high: anti-social behavior, aggressive behavior, violence, and crime. (f) Additional information: Any additional relevant information, such as subgroup analyses, moderators, or follow-up data, was also coded when available (Lipsey and Wilson, 2001).

2.2 Quality assessment

The Troyer scale is used to evaluate the quality of studies in the current meta-analysis (Troyer and Younts, 1997). It involves assessing each study based on several criteria: (a) Sample representativeness and heterogeneity: Studies get 2 points for having a representative, heterogeneous sample; 1 point for a moderately representative sample; and 0 points for an unrepresentative sample. (b) Effect size calculation: Studies get 2 points for using appropriate statistical methods to calculate effect sizes; 1 point for using basic methods; and 0 points for not providing effect sizes. (c) Peer-review: Studies published in peer-reviewed journals get 1 point; non-peer-reviewed studies get 0 points. (d) Sample size: Studies with $n \geq 100$ get 2 points; studies with $50 \leq n < 100$ get 1 point; studies with $n < 50$ get 0 points. (e) The points are summed to give an overall quality rating: 7–8 represents high quality; 4–6 represents Medium quality; 0–3 represents Low quality. By assessing indicators like sample characteristics, statistical analysis, peer review, and sample size, the Troyer scale provides a relatively comprehensive measure of study quality for meta-analyses.

2.3 Meta-analysis procedure

The coded data were synthesized using meta for packages in R (R Core Team, 2016). Given that some effect sizes are got from the same sample in current data, the three-level meta-analytic methods with random effect size model were used to calculate overall effect sizes and assess heterogeneity among studies, because we hypothesis that there are significant heterogeneity exist. Three-level meta-analysis is a statistical technique employed in meta-analytic research to address the potential issue of non-independence among effect sizes derived from the same sample. To accommodate this non-independence, three-level meta-analysis employs a more sophisticated approach to estimating the overall effect size and its associated uncertainty. Before the formal meta-analysis, each correlation coefficient underwent Fisher's z-transformation (Gleser and Olkin, 2009), due to the non-normal distribution of correlation coefficients, unless the population correlation coefficient equates to zero. Consequently, this weighting scheme led to larger-scale studies exerting a more substantial influence during the pooling process. Additionally, we conducted an exploration of potential outliers using studentized residuals and executed leave-one-out sensitivity analyses (Viechtbauer and Cheung, 2010).

To explore potential factors that might influence the relationship, we conducted several meta-regressions with categorical variables are dummy codes. To address the issue of Type I errors in analyzing the dummy coded categorical variables, which can arise from multiple comparisons, we applied Bonferroni correction to adjust the probability values (Jafari and Ansari-Pour, 2019). Publication bias is a significant concern in meta-analytic research. It can distort effect size estimates and lead to incorrect conclusions (Begg and Mazumdar, 1994; Egger et al., 1997). To tackle this issue, we examined publication

bias using various diagnostic methods as follows: we generated funnel plots for effect sizes, displaying effect size estimates against their standard errors. A symmetric funnel plot suggests a lower likelihood of publication bias, while asymmetry may indicate the presence of bias (Sterne et al., 2011). We also used the recommended adapted Egger's regression test to Diagnostics the possible of publication bias (Rodgers and Pustejovsky, 2020). This method is proved to be more suitable to deal with meta-analytic data with multi-level (Ditzer et al., 2023). the tim-fill method and Rosenthal's fail-safe N method are also used for detecting publication bias (Rosenthal, 1979; Duval and Tweedie, 2000).

3 Results

3.1 Inclusion of studies and coding consistency

Our initial search was conducted up to July 2023, and subsequently, we conducted an updated systematic search for any newly published studies up to January 2024. This comprehensive search generated a total of 4,833 results. After a meticulous review, we eliminated 1,660 duplicate records and excluded 2,573 studies that did not align with our inclusion criteria.

Finally, we proceeded to assess 600 articles through a thorough examination of their full texts. Unfortunately, 565 of these studies did not provide the essential effect size data required for our analysis. Ultimately, we included a total of 35 pertinent studies, encompassing 144 effect sizes involved 159,213 participants.

For transparency, we have provided a visual representation of the document inclusion process in Figure 1. It was a high level of agreement, reaching 89%, between the two coders in the selection of relevant literature. To ensure the reliability of our coding process, we utilized Kappa statistic and the Intraclass Correlations Coefficient (ICC). The consistency and agreement in our coding were robust, with values ranging from 0.84 (Kappa) to 0.96. Any discrepancies in coding were promptly resolved through collaborative consensus discussions. Comprehensive information regarding the studies that were included in our analysis can be found in Table 1.

3.2 Overall effect size

The primary effects analysis incorporated 35 pertinent studies, encompassing 144 effect sizes. Sensitivity analysis (with studentized residuals > 2.5 and Cook's d value > 0.4) found no outlines. To account for the anticipated presence of moderators that could contribute to effect size heterogeneity, we employed a random effects model for the meta-analysis. The combined effect size of corpral punishment and VBS was calculated to be $r = 0.238$, with a 95% confidence interval of [0.176, 0.300]. This substantial effect size is indicative of small but significant positive relationship between corpral punishment and VBS as recommended by Lipsey and Wilson's criterion for defining a high correlation (Lipsey and Wilson, 2001). In terms of the distribution of variance, approximately 9.49%of the variance is attributed to within-study factors (I^2_{level2}), while 89.6% is attributed to between-study factors (I^2_{level3}). This result provides robust support for Hypothesis.

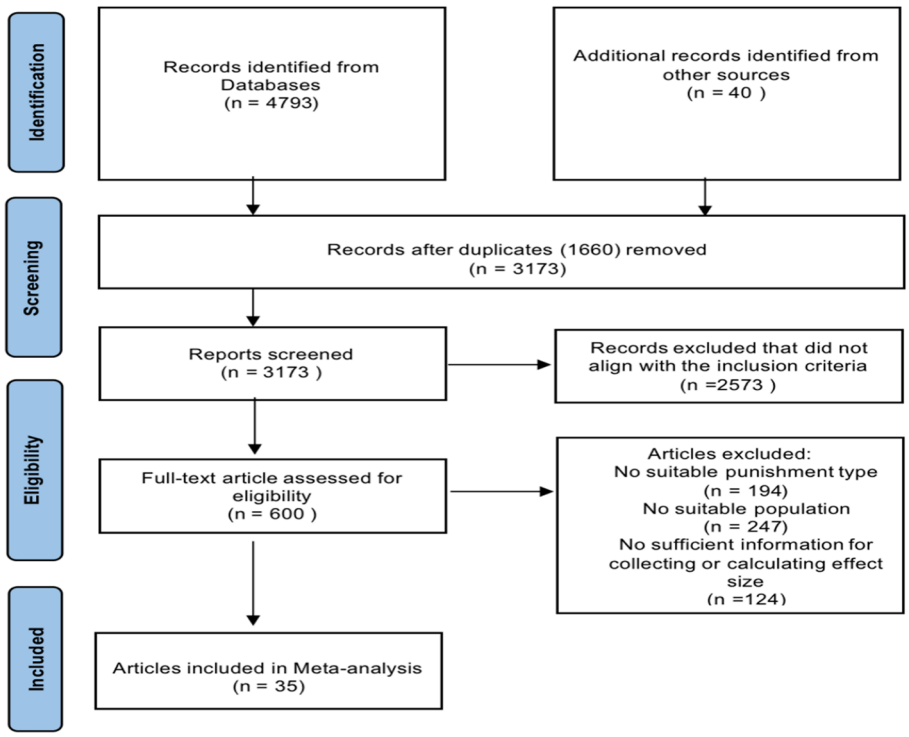

FIGURE 1
PRISMA flow diagram for new systematic review.

TABLE 1 Comprehensive information of included studies.

Author(s)	Pub_year	*K*	*n*	Gender	Age	State	VBS_type	Pun_lev
Boutwell	2011	1	10,700	49	4	USA	Anti-social	MCP
Taylor et al.	2010	5	2,461	48.1	5	USA	Aggression	MCP
Temple and Scott	2017	2	758	61	20	USA	Violence	MCP
Zottis et al.	2013	18	247	53	12.5	Brazil	Violence	MCP
Hecker et al.	2013	4	409	48	10.49	Africa	Aggression	LCP
Pagani et al.	2004	2	1,175	52	15.7	Canada	Aggression	HCP
Morrison and Gibson	2015	3	704	0	11	USA	Anti-social	HCP
Proulx et al.	2018	2	9,376	70	21	China	Crime	LCP
Liu	2015	8	2,707	0.45	13.5	China	Aggression	LCP
Ma et al.	2018	4	2,472		4	USA	Aggression	MCP
Beckmann	2019	2	7,423	52.3	14.9	Germany	Crime	MCP
SimonsandSutton	2020	3	318	0	23.75	USA	Crime	MCP
Li et al.	2021	1	3,180	47.48	14.93	China	Aggression	MCP
JoynerandBeaver	2022	2	5,827	50	7	USA	Crime	MCP
Straus et al.	1997	20	380	0	4	USA	Anti-social	MCP
Liu et al.	2022	2	2,075	100	13.95	China	Violence	LCP
Ma et al.	2022	1	2,180	49	6.5	Korea	Aggression	LCP
Chen and Pan	2021	1	433	50.6	9	China	Violence	MCP
Lozano and Contreras	2021	2	1,543	49.8	19.9	Spain	Violence	HCP
Gunnoe and Mariner	1997	3	1,112	100	7.5	USA	Aggression	LCP
Sears	1960	4	160	100	12	USA	Aggression	MCP
Slade and Wissow	2003	1	1,966	50	17.5	USA	Aggression	MCP
Lee et al.	2014	4	1,298		3	USA	Aggression	MCP
Joana et al.	2018	4	896	58.8	14.9	Spain	Aggression	MCP
Zulauf et al.	2017	4	240	49.2	3.5	USA	Aggression	MCP
Lee et al.	2013	6	3,279	48	4.7	USA	Aggression	MCP
Berlin et al.	2009	12	2,573	49	2	USA	Aggression	MCP
Ortiz et al.	2015	2	2,060	47.9	14.34	Spain	Violence	MCP
Wang et al.	2016	1	1,971	49.3	12	China	Aggression	MCP
Avinun et al.	2017	2	875	50	6.5	Israel	Aggression	MCP
Liu et al.	2021	1	1,635	54.6	14.24	China	Aggression	MCP
Cresent	2005	4	286	50	5	China	Aggression	MCP
Zhu et al.	2017	9	342	48.8	12.4	China	Aggression	MCP
Lansford et al.	2014	3	85,999	50	8		Aggression	LCP
Monika et al.	2016	1	153	51.2	21.45	Polish	Aggression	MCP

pub_year represents the publication year; k represents the effect size number in one study. n represents the sample size; Gender represents the percentage of females in the total sample; Age represents the average age of the participants; Pun_lev represents the severity of corporal punishment; LCP represents low-level corporal punishment; MCP represents middle-level corporal punishment; HCP represents high-level corporal punishment. VBS_type represents the type of VBS, the range from mild to severe is as follows: anti-social behavior, aggression, violence, and crime.

3.3 Result of publication bias

In our assessment for the potential presence of publication bias, we employed a multifaceted approach. First and foremost, we scrutinized a funnel diagram (Figure 2) as an integral component of our analysis. Additionally, Due to the nested structure of the data, the traditional Egger's test for publication bias is not applicable. Therefore, we employed the latest MAML Egger's test, which uses the standard error of the effect size as a function (Rodgers and Pustejovsky, 2020). If the regression coefficient of the effect size on the standard error variation is significant, it indicates the presence of significant publication bias. The results of yielded a b value of −0.4126 ($p = 0.500$) which shown little evidence for publication bias. Thirdly, we applied the trim-fill method to estimate the number of potentially missing studies on the opposite side of the funnel plot (the number is 0) (Duval and Tweedie, 2000). we also conducted an analysis using

Rosenthal's fail-safe N (safety number) (Rosenthal, 1979). The result revealed a Fail-safe N value of 1,757,217, which is greater than 5*k + 10, where "k" represents the number of observed studies. All of these methods consistently support our conclusion that there is little evidence of substantial publication bias impacting our study results.

3.4 Results of main effect

The results were obtained from the random effect models of three-level meta-analyses. For the overall model, the result showed a positive correlation ($r = 0.238$; 95% CI = [0.176, 0.300]), exhibiting a small effect size (Cohen, 1992). As for the LCP model, the result showed a positive relationship ($r = 0.220$; 95% CI = [0.089, 0.350]), exhibiting a small to medium effect size. As for the MCP model, a positive relationship ($r = 0.225$; 95% CI = [0.162, 0.288]) was found, exhibiting a small to medium effect size. Furthermore, the pooled effect size of the HCP model showed a positive relationship, but the association is not significant ($r = 0.318$; 95% CI = [−0.128, 0.764]). Table 2 depicts the results of the main effect analyses.

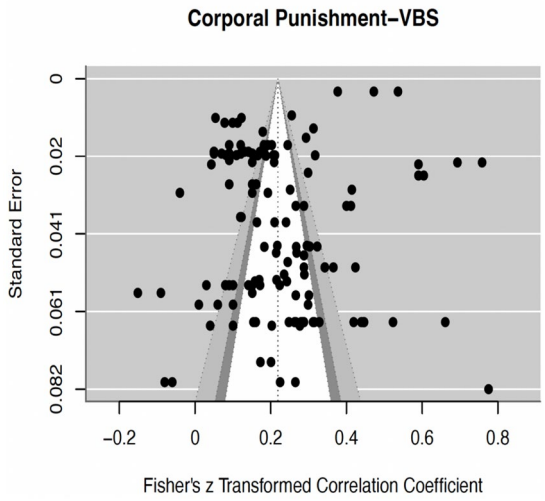

FIGURE 2
The contour-enhanced funnel plot. The y-axis displays the standard error, while Fisher's z is plotted on the x-axis. The observed effect sizes are represented by black dots. The overall mean effect is depicted by a middle dashed line. The contour lines, progressing from inner to outer, delineate the 90%, 95%, 99% pseudo confidence interval regions.

3.5 Result of meta-regression

In order to thoroughly investigate potential moderating factors influencing our research, such as publication year, age, gender, culture VBS type and punishment severity, we carried out comprehensive meta-regression analyses. The outcomes of these analyses are summarized as follows (see Table 2): (a) Publication year ($b = 0.005$, $p = 0.092$) did not demonstrate a statistically significant moderating influence on the relationship under investigation. (b) With adulthood as the reference category, developmental stage exhibited non-significant moderating effects for both children ($b = -0.60$, $p = 0.416$) and adolescents ($b = 0.082$, $p = 0.404$) on the relationship. (c) Gender ($b = 0.002$, $p = 0.067$) did not yield a statistically significant moderating effect. (d) Culture ($b = 0.029$, $p = 0.679$) also failed to exert a statistically significant moderating impact. (e)With aggression as the reference category, VBS type exhibited non-significant moderating effects for anti-social behavior ($b = 0.095$, $p = 0.166$), Violence ($b = 0.072$, $p = 0.471$) and Criminal behavior ($b = -0.133$, $p = 0.182$) on the relationship. (f) With low punishment level as the reference category, punishment level exhibited a significant moderating effect for both medium punishment level ($b = 0.084$, $p = 0.010$) and high punishment level ($b = 0.134$, $p = 0.004$) on the relationship. The analysis revealed a noteworthy finding, indicating that punishment severity indeed exerts a statistically significant moderation effect on the relationship, signifying its importance in our study. We also performed subgroup analyses to uncover the specific effect sizes associated with each category of moderators (refer to Table 3).

4 Discussion

This study employed a three-level meta-analysis system to delve into the relationship between corporal punishment and the Violent Behavior Spectrum (VBS). The findings revealed a statistically significant but modest effect size between the two variables. These results are consistent with previous empirical studies and meta-analyses, providing further support for social learning theory as a relevant framework. Moreover, the analysis of moderating effects shed light on the significant impact of the intensity of corporal punishment on the relationship between corporal punishment and VBS. This finding aligns with previous studies and offers valuable insights into the nuanced boundary conditions of the relationship between corporal punishment and VBS (Ferguson, 2013; Patrick and Drislane, 2015). From a practical perspective, these research findings carry substantial implications for guiding future interventions and developing programs aimed at preventing and addressing the VBS.

TABLE 2 Pooled effect sizes of corporal punishment-vbs association.

Model types	*k*	#ES	*r*	95% CI	$I^2_{level\ 2}$	$I^2_{level\ 3}$	$\sigma^2_{level\ 2}$	$\sigma^2_{level\ 3}$	*Q*
Overall model	35	144	0.238***	[0.176, 0.300]	9.49%	89.6%	0.032	0.003	14373.910***
LCP model	5	12	0.220***	[0.089, 0.350]	17.98%	81.77%	0.018	0.004	2581.875***
MCP model	123	31	0.225***	[0.162, 0.288]	7.80%	90.28%	0.030	0.003	3127.145***
HCP model	9	3	0.318	[−0.128, 0.764]	17.28%	81.00%	0.010	0.021	191.669***

k: Number of studies; #ES: Number of effect sizes; r: Mean effect size after correcting for measurement error; 95%CI: 95% confidence interval of r; $I^2_{level\ 2}$: Percentage of variance distributed at the within-study level; $I^2_{level\ 3}$: Percentage of variance distributed at the between-study level; $\sigma^2_{level\ 2}$: Variance of effect sizes extracted from the same study; $\sigma^2_{level\ 3}$: Variance of effect sizes between studies; Q: Q-statistic magnitude used to assess the heterogeneity of effect. *$p < 0.05$. **$p < 0.01$. ***$p < 0.001$.

TABLE 3 Results of moderators for the effect sizes.

Moderators	*B*	SE	*p*
Publication year	0.005	0.003	0.092
Gender	0.002	0.001	0.067
Development stage (adult as reference category)			
Children	−0.060	0.074	0.416
Adolescent	0.082	0.098	0.404
Culture (East culture as reference category)			
West culture	0.029	0.071	0.679
Punishment level (Low punishment level as reference category)			
Medium punishment level	0.084**	0.032	0.010
High punishment level	0.134**	0.046	0.004
VBS type(aggression as reference category)			
Anti-social behavior	0.095	0.068	0.166
Violence	0.072	0.099	0.471
Criminal behavior	−0.133	0.099	0.183

Gender was coded as the proportion of female participants in the study sample. Development stage was categorized based on subjects' age, grouped as child (age < 13), adolescent (age < 19), or adult (age ≥ 19). Culture was classified based on the country in which the study was conducted; countries were grouped into East and West categories based on cultural commonalities. Punishment level was categorized as low, medium, or high based on the frequency of punishment enacted and degree of pain inflicted, both physically and psychologically. VBS type was categorized as anti-social behavior, aggression, violence or crime according to the severity of the VBS.

4.1 Corporal punishment and VBS

The current findings revealed a positive correlation between corporal punishment and VBS. The findings align with prior research (Gershoff, 2002). This consistency across studies underscores the robustness of this association and provides a solid foundation for our exploration of the intricate mechanisms that underlie this relationship. As we delve deeper into the theoretical underpinnings, it becomes evident that social learning theory offers invaluable insights into explaining the observed correlation. This theoretical framework, firmly grounded in Bandura's influential work (Bandura and Jeffrey, 1973), emphasizes the role of observational learning in shaping behavior. In the context of corporal punishment, it proposes that when children are exposed to adults employing violence as a disciplinary tactic, they become susceptible to modeling this behavior. The process is akin to a form of social mimicry, where children internalize the observed violent actions and subsequently replicate them in their own interpersonal interactions. Therefore, the positive correlation between corporal punishment and VBS can be attributed to this intricate social learning process. Children, as per this theory, may perceive violence as a legitimate and effective means of problem-solving or conflict resolution because they have witnessed its application by authority figures, such as parents or caregivers. This modeling effect can lead to the adoption of violent behaviors as a learned response to challenging situations, thereby strengthening the link between corporal punishment and the manifestation of VBS. Simultaneously, this study deepens our understanding of the theory of socio-moral development. Rewards and punishments can be used to uphold societal moral standards. When the purpose of punishment is to aid children in learning moral norms and the severity is relatively low, it may not increase aggressive behavior in children. However, highly severe and frequent punishment can contribute to subsequent aggression (Baker and Liu, 2021; Geraci et al., 2023).

4.2 Punishment severity as a moderator

In our study, we have uncovered pivotal moderating influences that shed light on the relationship between corporal punishment and the Violent Behavior Spectrum (VBS). These insights provide invaluable guidance for understanding the intricate dynamics at play.

Control theories posit that corporal punishment, when judiciously administered without excessive severity, can serve as a tool to reinforce self-regulation and potentially deter future antisocial behavior (Gottfredson and Hirschi, 1990). This perspective hinges on a crucial distinction between the consequences of mild versus severe punishment, aligning with contrasting theoretical models—one emphasizing learning and the other focusing on control. Our findings align with this theoretical framework and resonate with extensive empirical evidence. Notably, Gershoff's meta-analysis established a clear dose–response relationship, linking more severe and frequent corporal punishment to higher levels of child aggression (Gershoff, 2002). Longitudinal studies have similarly highlighted that experiences of physical abuse during childhood correlate with subsequent involvement in violent crimes, whereas mild spanking does not share this association (Ferguson, 2013). This divergence in outcomes can be attributed to the fact that severe punishment may trigger hostile attribution and heightened rejection sensitivity, whereas milder disciplinary measures offer an avenue for learning without causing trauma (Xu et al., 2023).

4.3 Limitations and future directions

Despite providing valuable insights, this meta-analysis has limitations that present intriguing future research directions: (a) Included studies exhibited methodological and demographic homogeneity. Examining more diverse studies conducted in varying cultural contexts and age groups would be beneficial; (b) The correlational nature of included studies precludes determining causality definitively. Longitudinal designs could offer deeper understanding of the temporal relationship; (c) Measurement heterogeneity may have introduced bias. Standardized, consistent tools could enhance comparability; (d) Context-specific corporal punishment approach impacts on violent tendencies may be a valuable research avenue; (e) Previous research suggests that children's understanding of corporal punishment may moderate the relationship between corporal punishment and aggressive behavior. However, quantifying children's perceptions regarding corporal punishment has posed challenges in past work. Therefore, we did not encode children's understanding as a moderating variable in our study. Going forward, developing quantifiable measures to assess how individuals perceive and comprehend corporal punishment could prove informative. Incorporating such metrics as moderators may further elucidate the nuances of how corporal punishment potentially impacts aggressive behavior; (f) The relatively few included studies led to insufficient statistical power for some subgroup analyses. Understanding when and where certain disciplinary strategies are more or less effective is essential for practical implications. Further research should also evaluate interventions aimed at reducing corporal punishment and

associated outcomes. This would provide actionable insights for policymakers and practitioners.

5 Conclusion

In this meta-analysis, we uncovered a mild yet significant correlation between corporal punishment and subsequent violent tendencies, moderated by punishment severity, aligning with theories on conflicting learning and control mechanisms. While more research is warranted, these insights underscore measured, context-aware disciplinary approaches' importance as we strive to foster safer environments for children and adolescents.

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 author.

Author contributions

QP: Conceptualization, Supervision, Validation, Writing – original draft, Writing – review & editing. SC: Conceptualization, Data curation, Writing – review & editing. YQ: Data curation, Writing – review & editing.

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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.

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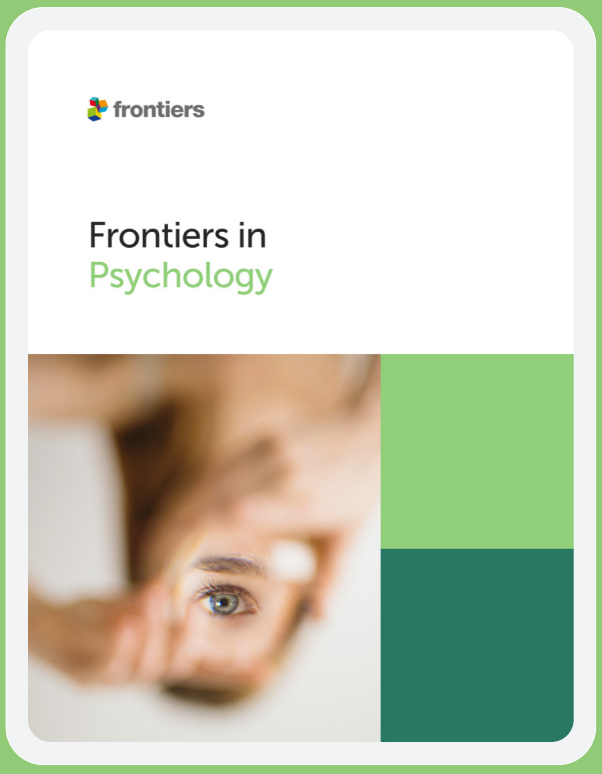

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