

Personal competences in the academic and work environment: advancing towards psychological wellbeing

Edited by

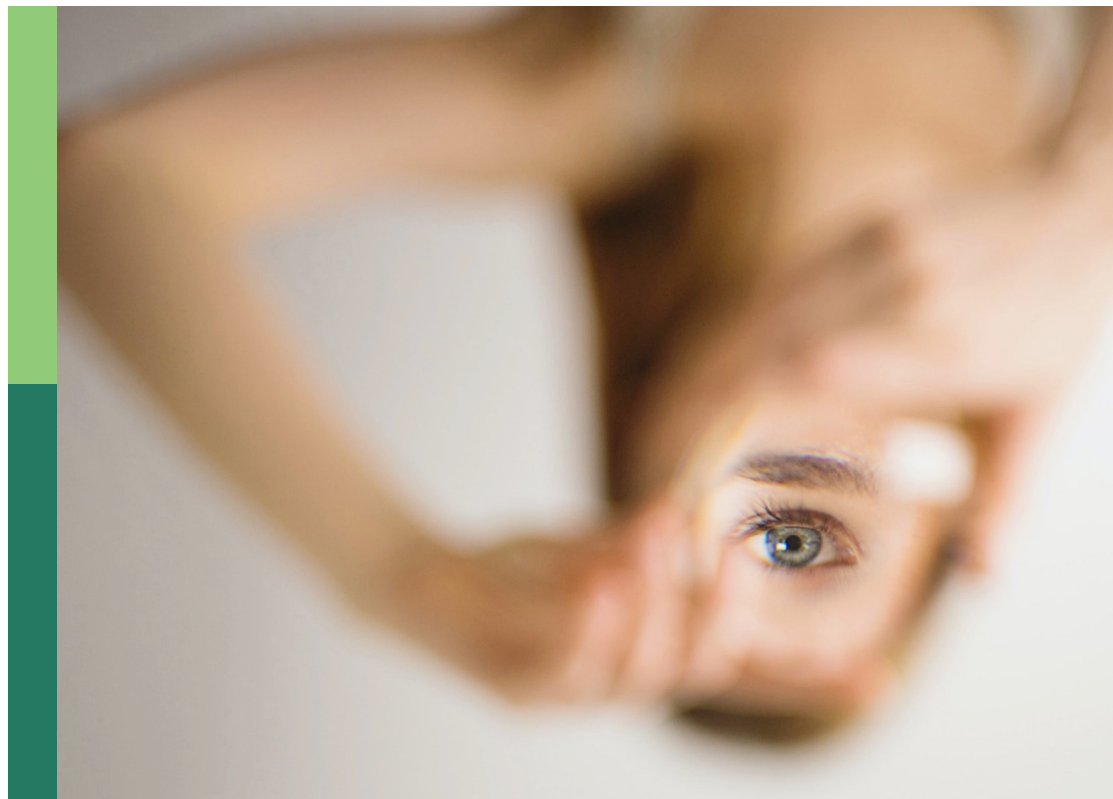
María del Mar Molero Jurado, María del Carmen Pérez-Fuentes and Carol D. Ryff

Coordinated by

Pablo Molina

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Personal competences in the academic and work environment: advancing towards psychological wellbeing

Topic editors

Maria del Mar Molero Jurado — University of Almeria, Spain

Maria del Carmen Pérez-Fuentes — University of Almeria, Spain

Carol D. Ryff — University of Wisconsin-Madison, United States

Topic coordinator

Pablo Molina — University of Almería, Spain

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EDITED AND REVIEWED BY
Gerald Matthews,
George Mason University, United States

*CORRESPONDENCE
María del Mar Molero Jurado
✉ mmj130@ual.es

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Editorial: Personal competences in the academic and work environment: advancing towards psychological wellbeing

María del Mar Molero Jurado^{1*},
María del Carmen Pérez-Fuentes¹, Carol D. Ryff² and
Pablo Molina Moreno¹

¹Department of Psychology, University of Almería, Almería, Spain, ²Institute on Aging / Department of Psychology, University of Wisconsin-Madison, Madison, WI, United States

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psychological wellbeing, personal competencies, emotional intelligence, self-efficacy, academic and work environment, cultural engagement, mental health promotion

Editorial on the Research Topic

Personal competences in the academic and work environment:
advancing towards psychological wellbeing

1 Introduction

Psychological wellbeing and individual development are core aspects of human development, involving ongoing processes of self-realization and life satisfaction. In this context, personal competencies—such as emotional intelligence, self-esteem, resilience, assertiveness, and autonomy—are recognized as essential resources for maintaining healthy psychological functioning. These skills support adaptability to change, regulate stress effectively, and navigate everyday challenges, thereby fostering a more fulfilling and meaningful life across personal, academic, and professional areas.

In addition to these competencies, cultural, artistic, and humanities-based experiences have shown transformative potential, enabling expression, self-reflection, and meaning-making processes that enhance psychological wellbeing. Wellbeing is thus understood not merely as the absence of psychological distress but as an active, dynamic journey of personal growth and fulfillment throughout the lifespan. The integration of personal competencies and enriching life experiences provides a promising foundation for the design of interventions, educational programs, and preventive strategies aimed at strengthening mental health and promoting personal growth.

This Research Topic provides an in-depth analysis of the ways in which personal competencies and cultural and artistic engagement contribute to psychological wellbeing from a positive perspective. It brings together empirical studies that, through an integrative lens, explore protective factors, theoretical models, and intervention approaches aimed at enhancing personal growth and mental health across diverse populations and settings. The following section offers a thematic synthesis of the key contributions.

2 Thematic overview

The 10 studies included in this Research Topic are grouped into four thematic areas. The first study explores how personal competencies promote psychological wellbeing in young people during formative stages. The second study focuses on the effects on teachers, particularly in relation to reducing burnout, supporting career decision-making, and managing stress. The third study includes contributions that highlight the influence of cultural identity, emotional intelligence, and critical thinking in populations engaged in arts, music, or sports. The fourth study presents a methodological contribution involving the validation of an assessment instrument.

A total of four studies explore the wellbeing of young adults during their higher education years. For example, [Pinos Ullauri et al.](#) analyzed how postgraduate studies influence the development of soft skills in engineering students. They found that, on average, these programs enhance soft skills, particularly leadership, innovation, and stress management. [Huang et al.](#) found that self-compassion and stress management are associated with higher life satisfaction, an effect mediated by personal competencies such as resilience, optimism, and self-efficacy. [Fan and Cui](#) demonstrated that mindfulness, self-efficacy, and self-regulation predict wellbeing among university students learning English as a foreign language, with self-regulation serving as a key mediator. [Li F. et al.](#) found that social media usage influences the career decision-making of university students through the mediation of work values and, notably, self-efficacy, which plays a critical role in enhancing this effect.

Another thematic area is represented by three studies that address teacher burnout and performance. One study, conducted by [Chunyan and Ying](#) with English teachers in primary schools, showed that a proactive personality predicts greater enjoyment in teaching and lower levels of burnout. Furthermore, [Li Y. et al.](#) explored how work–family conflict is associated with teacher burnout, with this relationship mediated by depression and moderated by cognitive reappraisal.

Finally, some studies highlight the impact of culture and identity on psychological development. [Peng](#) investigated the relationship between critical thinking, cultural intelligence, and eudaimonic wellbeing among art students, providing evidence of their role in the development of personal identity. In a study on music, [Jing](#) found that emotional intelligence mediates the effect of stress on mental health in music students, with this relationship moderated by the honesty–humility trait from the HEXACO model. In the context of sports, [Liang et al.](#) revealed that mindfulness helps reduce impulsivity in athletes by enhancing self-reflection and coping skills.

From a methodological perspective, the contribution by [Doshi et al.](#) validates the Swedish version of the Impostor Profile (IPP30) scale for assessing the impostor phenomenon, opening new avenues for understanding its impact on self-perception and emotional adjustment.

3 Conclusion and future directions

The studies gathered in this Research Topic reinforce the idea that psychological wellbeing is built through personal

competencies and cultural experiences that help individuals confront contemporary challenges, strengthen their identity, and support integral development. Personal competencies such as self-compassion, self-efficacy, critical thinking, and emotional intelligence have positive effects on both student and teacher populations, acting as protective factors against stress, impulsivity, and burnout. In addition, the role of cultural, artistic, and contextual elements in shaping wellbeing is evident, offering a broader and more sensitive perspective on the diversity of experience. This Research Topic of studies not only expands our understanding of the mechanisms underlying wellbeing and personal development but also provides practical tools for educators, psychologists, and professionals.

Looking ahead, there is a need for longitudinal studies that capture the dynamic evolution of these competencies over time. Equally important is the development of training programs and interventions that integrate these variables across educational, professional, and community settings, with the aim of not only preventing psychological distress but also promoting personal and social development. This Research Topic also highlights the importance of advancing innovative methodological approaches that can provide deeper insights into these complex processes.

Author contributions

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EDITED BY

María del Carmen Pérez-Fuentes,
University of Almeria, Spain

REVIEWED BY

Lene Graupner,
North-West University, South Africa
Anna K. Touloumakos,
Panteion University, Greece

*CORRESPONDENCE

Luis Alberto Pinos Ullauri

✉ luis.pinos-ullauri@imt-nord-europe.fr

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Modeling the effect of postgraduate courses on soft skills: a practical approach

Luis Alberto Pinos Ullauri^{1,2,3*}, Alexis Lebis¹, Abir Karami⁴,
Mathieu Vermeulen¹, Anthony Fleury¹ and
Wim Van Den Noortgate^{2,3}

¹IMT Nord Europe, Institut Mines-Télécom, Univ. Lille, Centre for Digital Systems, Lille, France, ²Faculty of Psychology and Educational Sciences, KU Leuven, Kortrijk, Belgium, ³IMEC Research Group ITEC, KU Leuven, Kortrijk, Belgium, ⁴ICL, Junia, Université Catholique, LITL, Lille, France

Over the last decade, Higher Education has focused more of its attention toward soft skills compared to traditional technical skills. Nevertheless, there are not many studies concerning the relation between the courses followed within an academic program and the development of soft skills. This work presents a practical approach to model the effects of courses on soft skills proficiency. Multiple Membership Ordinal Logistic Regression models are trained with real data from students of the 2021, 2022, and 2023 cohorts from the general engineering program in a French Higher Education institution. The results show that attending a postgraduate course in average increases the odds of being more proficient in terms of soft skills. Nonetheless, there is considerable variability in the individual effect of courses, which suggest there can be huge differences between courses. Moreover, the data also suggest great dispersion in the students' initial soft skill proficiency.

KEYWORDS

soft skills, courses, modeling, multiple membership, multiple imputation

1 Introduction

Soft skills have gathered considerable attention, especially in Higher Education Institutions (HEI). International organizations, such as the European Union with the Bologna process, have pushed HEI to consider competencies, life-learning skills or soft skills in their curricula (European Higher Education Area, 2016; Council of the European Union, 2018). The work by Caeiro Rodriguez et al. (2021) studied the European perspective of soft skill development in Higher Education investigating the different practices in 5 European countries, describing the current pedagogical methodologies (e.g., problem, project, or simulation-based methods) that aim to support soft skills, their advantages and limitations. Moreover, Almeida and Morais (2021) analyzed 4 case studies of HEI in Portugal addressing soft skills in their curricula. They realized that although the number of courses that explicitly took into account soft skills in their pedagogical activities was rather small, there was growing pressure and interest from HEI in incorporating such skills as core parts of the curricula.

Arvanitis et al. (2022) studied, through focus groups with stakeholders from HEI in Greece, strategies to fill the soft skills "gap." This is the difference between the soft skill proficiency demanded in industry compared to the one developed in HEI. A possible strategy for HEI towards reforming and changing curricula across all levels and degrees could be to analyze their current state, that is, how their curricula help students develop their soft skills. Since courses are amongst the most common modular parts of any curriculum (there could be other elements that award credits such as projects or internships), they could serve as

valuable information to help explain the students' soft skill proficiency across time. This would allow the quantification of the effect of the courses of the curricula on the students' soft skills. In other words, we could inspect whether a particular course helps more or less, compared to other courses, the students in terms of their soft skills. Therefore, in this context, the following research questions are examined.

RQ1: How can we model the effect of courses on the soft skills of postgraduate students?

Secondary research questions are:

RQ2: How is the soft skill proficiency's behavior throughout the academic program?

RQ3: How is the behavior of the course effects on soft skills?

RQ4: What are the degrees of linear correlation of course effects across different soft skills?

Nevertheless, before attempting to answer any of these questions, it is important to underline that there is not a full consensus regarding the definition of "soft skills." The work by Touloumakos (2020) describes how these expanded from the overall definition of "skills", encompassing a variety of attributes and traits, which do not require specific contexts in contrast to more technical skills. Their increasing relevance has promoted many researchers to try to define them, engaging in a long debate about what may or may not be considered as soft skills (Hurrell et al., 2013). According to Almonte (2021), soft skills are difficult to conceptualize in a cohesive and clear way without considering their elasticity and multifaceted perspectives. Furthermore, there are other terms that may be pseudo-interchangeable (depending on the context and definition) with soft skills such as 21st century skills (Partnership for 21st Century Skills, 2007), 4C Skills (Ye and Xu, 2023), graduate skills (Barrie, 2007), competencies, life skills (Council of the European Union, 2018), generic skills (Tuononen et al., 2022), transferable skills, and employability skills.

These other terms, however, may focus on other aspects, which do not necessarily concern soft skills. For example, employability skills generally relate to skills that help increase the chances of employment whereas transferable skills stress the skills that can be developed in a particular situation and transferred into another (Jardim et al., 2022; van Ravenswaaij et al., 2022). On the other hand, graduate skills emphasize the skills expected from university graduates whereas generic skills mostly relate to the generic aspect of skills that are not context-specific and can be used in different situations. For the purposes of this study, the term "soft skills" refers to non-technical, personal and social skills that can be used in various situations. For instance, Leadership and Stress Management are non-technical skills with a personal and interpersonal nature. In a situation, such as an industrial interdisciplinary project, the participants may need to take full advantage of these skills to manage their stress and lead the groups they are in charge of. Moreover, these same skills could also be used on academic settings, such as group coursework within courses where students would need to work together to accomplish the requirements of the pedagogical activity.

The pressure of the focus on soft skills has not only been present in HEI, but also in industry. There are several studies investigating the requirements of the industry in terms of soft skills along with the perceptions of both student and employers of soft skills as means to improve graduate employability (Ellis et al., 2014; Succi and Canovi, 2020; Xu et al., 2022). Moreover, the work by Cacciolatti et al. (2017) studied the clash between the employers' needs of both technical and soft skills along with the universities' policies towards these skills in the United Kingdom.

Since skills, in general, are latent variables (i.e., variables that can not be directly observed, and only estimated with a model that links latent variables with one or more manifest variables), the estimation of soft skills is an important part to consider. There are some strategies that may be followed to estimate soft skills. A questionnaire consisting of binary or multiple choice questions, designed to estimate a soft skill in particular (e.g., Stress Management), could be deployed. Then, either Classical Test Theory (CTT) (Novick et al., 1968), or Item Response Theory (IRT) (Lord, 1952; Rasch, 1960) could be used. With CTT, the questionnaire could be validated [e.g., with item-total correlations and Cronbach's alpha (Novick and Lewis, 1966)] in order to ensure that the questions reliably measure the construct, and then estimate the soft skill with the assumption that the computed score comprises the true soft skill proficiency alongside an error residual. In contrast, IRT models in a non-linear way the probability of correct responses based on underlying person and item characteristics, being the person characteristic, in this case, the soft skill proficiency. Another strategy could be to develop a marking scheme or rubric that describes in depth the levels of proficiency that are expected of the individuals to be assessed, thereby having pre-defined ordered levels of proficiency.

Several studies have estimated soft skills or their perception through some of the previously mentioned strategies. For instance, Chamorro-Premuzic et al. (2010) performed various studies in United Kingdom universities, where one of those was based on the students' perceptions of the influence of soft skills proficiency towards obtaining first class degrees (a distinction degree awarded at United Kingdom universities). They used a 7-likert type scale (scale from 1 to 7, where 1 was "Not at all" and 7 "Extremely useful") of an inventory of 15 soft skills, and computed a total score per soft skill by calculating the mean score across items. Other studies have also taken a similar approach towards the estimation of soft skills with the computation of likert-type scale-measures across various items (Feraco and Meneghetti, 2022; Salem, 2022). Moreover, the work by Zendler (2019) studied the modeling of competencies in Computer Science Education using IRT. Furthermore, multidimensional IRT (Adams et al., 1997; Reckase, 2009), which considers the interplay between multiple abilities through compensatory or partially compensatory methods, has been used to model competencies (Hartig and Höhler, 2008, 2009), and could be used, in principle, to estimate latent soft skills based on soft skill item responses.

There have also been a few studies which investigated the interplay between courses and soft skills. The work by Muukkonen et al. (2022) studied the students' self-perceptions towards competence gains in 28 courses from two large Finnish universities. The study showed the effects of courses on skill growth to be

statistically significant between courses. We follow this line of thought, in which students, besides achieving technical learning objectives, may also develop their soft skills by attending courses. We further assume that this development occurs in varying degrees across the entire curriculum (given their multidisciplinary nature, multiple courses could affect the same soft skill, e.g., a course from computer science, such as mobile application development, and another course from chemical engineering, such as organic chemistry, could both affect the problem solving skills of students). However, optimizing the development of soft skills throughout the program requires understanding the relation between courses and soft skills. An exploration of the effect of courses on soft skills can serve as a tool to study whether it is appropriate to adjust the curriculum (e.g., add, remove or adapt courses with soft skills centered pedagogical activities) if the curriculum does not sufficiently foster soft skills according to the aims of the HEI.

Continuous data is comprised within an infinite number of possible measurements between two specified limits. These measurements can include decimals. For instance, a continuous scale where the minimum is 1 and maximum is 4 can comprise measurements such as 1.01 or 3.85. Continuous models are based on distributions that can predict continuous data. Nonetheless, these models can be adapted to account for the discrete nature of categorical data. Soft skill proficiency can be estimated categorically (e.g., Leadership could be assessed in levels of proficiency such as Satisfactory, Good, Very Good, and Excellent). A first modeling approach could be to use mixed regression models to explain the soft skill proficiency with courses as predictors and random effects across students regarding their individual soft skill traits. In this approach, there would be a fixed effect, same for all students, of each course towards the students' soft skills proficiency. Nonetheless, a sizeable dataset would be needed to obtain stable fixed course effect estimates, particularly in HEI where the number of courses offered to students is considerably high. Therefore, in order to account for this issue, an overall general fixed effect of courses can be estimated instead of individual course effects. Moreover, random effects of courses and students can also be included to consider their variability. Students may not begin the program with the same level of soft skill proficiency. Similarly, courses may differ between themselves towards their effects on soft skills. For instance, course x may be more effective in helping students develop Project Management skills compared to course y .

The general aim of this study is to explore the relation between courses and soft skill proficiency of students, and showcasing a practical approach to model these course effects, which could serve as valuable input for the overall analysis of soft skills development within an academic program. In order to so, we leverage longitudinal data from a French engineering school, IMT Nord Europe, which is interested in redesigning their current general engineering program by incorporating soft skills. The engineering school developed a marking scheme to estimate the soft skills proficiency of the general engineer profile. This marking scheme is used throughout the academic program after each of the students' yearly internships, providing a longitudinal dataset describing their progress across time in terms of soft skill proficiency.

Section 2 describes in more detail the data used in this study as well as the statistical treatment of missing data from a part of the 2021 cohort. The models are also presented along with our Bayesian approach to estimate the parameters.

Section 3 presents the descriptive results of the students' soft skills proficiency across the last three years of the engineering program. Afterwards, the estimates of the parameters are presented, both continuously in the logit scale and through odds.

In Section 4, a discussion regarding the results is presented. Finally, the conclusions, limitations and possible alternatives for future work are described in Section 5.

2 Materials and methods

2.1 Data

The data was collected from the cohorts of students that graduated in 2021, 2022, and 2023 of the general engineering program (884 students in total), at IMT Nord Europe. The 5 year general engineering program contemplates 5 internships (one per year) for the students. Besides their regular studies, the students are also in constant involvement with the industry throughout the entire length of the program. After each internship, the students have their soft skills proficiency assessed by internship tutors with the previously mentioned marking scheme (see [Table 1](#)), which considers 10 soft skills and classifies their proficiency in 4 ordered categories. The marking scheme was developed by IMT Nord Europe in 2016, and later deployed by their Professional Development department in 2019.

Moreover, the students share the same curriculum up until the end of the third year. In the fourth and fifth years, they must choose a specialization, from which there is a catalogue of courses (104 different courses in the dataset, where some are exclusive to specific specializations) to choose with no prerequisites other than the hard skills we expect they have developed in previous courses. In addition, there are courses which are transversal and can be chosen across all specializations. The specializations are Energy and Environment, Digital, Industry and Services, and Materials and Civil Engineering. By taking advantage of the soft skill assessments at the end of the third year as an initial reference, we can focus our interest in the last two years (year 4 and 5), where the students can freely choose their courses (a maximum of 11 courses are followed up until the end), and therefore may end up with different courses by the end of the program. If the students were to follow the exact same curriculum, the variability in soft skill proficiency could be explained by a number of factors such as the initial differences between students or how a same course affects differently students. Nonetheless, in this case where students may follow different courses, their variability in terms of soft skill proficiency could also be affected by their heterogeneous course history.

We categorized the years as stages ($Stage = 0$ at the end of third year and reference for the models, $Stage = 1$ at the end of fourth year and $Stage = 2$ at the end of the fifth year or academic program). [Table 2](#) shows the number of students, whose soft skill proficiency data was assessed, per student cohort. It can be seen that there is no data from the 2021 cohort at the initial stage (the soft

TABLE 1 Translated soft skill assessment scheme.

Skill	Description	Score
Problem solving	Solve problems in familiar environments or in known contexts. Use solutions that are already outlined	1
	Solve related problems in new environments or in unknown contexts. Find solutions adapted to each situation	2
	Solve problems that are not always well defined, in complex environments or in contexts subject to strong constraints	3
	Reformulate problems according to different constraints and find adapted and efficient solutions	4
Innovation and creativity	Contribute to the search for ideas and solutions by participating in exchanges and creativity sessions and propose improvements	1
	Propose and apply proven solutions to new or different contexts	2
	Design and implement new solutions with a view to efficiency	3
	Recognize, transmit and implement the conditions and processes for generating innovation	4
Organization	Work independently on the basis of indications and instructions given. Monitor performance indicators, detect and report problems within the scope of activity	1
	Prioritize and plan their own workload, evaluate and correct completed activities (use performance indicators to assist in decision making)	2
	Prioritize and establish actions according to the stakes of the activities. Set up new relevant indicators. Share and promote best practices	3
	Transmit and share methods of organization and rigor with his interlocutors. Encourage them to use and follow relevant performance indicators. Deploy continuous improvement plans	4
Agility and adaptability	Implement activity changes that are requested	1
	Adapt and re-prioritize their activities and organization to changes and constraints	2
	Evaluate the impact of changes and propose appropriate responses or solutions	3
	Anticipate future developments and changes	4
Interaction and communication	Listen actively, express and formalize a point of view clearly, share information. Reformulate an idea without distorting it	1
	Effectively present an argument in a logical and argued manner, both in writing and orally. Know how to use a vocabulary that goes beyond the usual	2
	Use expression techniques (written and oral) adapted to the message to be delivered and the target audience (specialists and/or non-specialists), in a clear and unambiguous manner	3
	Communicate skilfully (vocabulary, style, ...) and finely in complex situations (sensitive message, difficult audience, unexpected situation...)	4
Project management	Work within a group (a team) and collaborate with team members in an open manner by communicating feedback on work	1
	Manage a small independent project or a part within a larger program. Accompany one or two collaborators on an operational activity	2
	Lead a major project or coordinate several operational projects simultaneously. Lead a complete team on an operational activity or project	3
	Lead and coordinate several strategic or operational projects simultaneously, training teams on project management, setting up adapted animation devices. Settling conflicts and arbitration situations in an objective and factual way without breaking interpersonal relations	4
Conviction	Explain a point of view in a clear way and with predefined or prepared arguments. Listen to, understand and reproduce a need expressed by others	1
	Adapt one's behavior, attitude, speech and arguments according to the audience in order to maximize the quality of exchanges. Interact to reformulate and deepen one's need in order to specify it and propose a response	2
	Identify and decipher the positions of the different strategic audiences, anticipate their expectations and reactions, identify and reach the right influence relays with the people to be convinced. To be a force of proposal in relation to an expressed need while rallying the stakeholders	3
	Implement strategic actions in a complex environment in a relevant and recurring manner to convince and influence key players. Anticipate the needs of their "clients," their environments and guide them in their evolution	4
Stress management	Work in low stress situations	1
	Adapt themselves to temporary stressful situations	2
	Adapt to prolonged stress	3

(Continued)

TABLE 1 (Continued)

Skill	Description	Score
	Use strategies to deal with stress themselves and for their collaborators	4
Leadership and influence	To take a step back and take initiatives in the service of activities and collaborators belonging to a close circle	1
	Share their own vision with familiar and occasional (or close and temporary) collaborators	2
	Promote their vision to internal and external decision-makers, and encourage their teams to take the initiative	3
	Pool resources and partners by creating a dynamic around a strategy and/or a change process	4
Decision making	Makes decisions based only on rules	1
	Makes decisions in situations where rule interpretation is possible	2
	Makes decisions interpreting the rules and improves them	3
	Makes complex decisions in absence of rules	4

The assessment scheme was developed by Cecile Leroy, Jean-Luc Caenen, and Didier Urschitz.

TABLE 2 Number of students per stage and cohort.

Stage	Cohort 2021	Cohort 2022	Cohort 2023
0	-	194	339
1	250	245	366
2	141	141	-

skill assessment program had not yet started) along with the last ongoing stage of the 2023 cohort. Given the importance of much data in order to model the effects of courses on soft skills, statistical techniques are used to handle the missing data from stage 0 of the 2021 cohort. As the same data will be collected in future years, we plan to update the analyzes each year.

The dataset structure, which comprises the longitudinal annual soft skills proficiency and course history of the last three years of the general engineering program, is shown in Table 3. The first column represents the student identifiers. The *Stage* describes the year during which the data from the student in question were collected whereas the W_c columns represent dummy variables with w_{cst} equal to 1 if student s has followed course c by stage t , otherwise equal to 0. Moreover, the dummy variables keep the previous courses up until stage t . The N column describes the cumulative number of courses of student s up until that time t (It could also be thought of as the row sum of the W_c columns). $sskill_{ist}$ is the soft skill score of student s at stage t on soft skill i . For instance, the student with identifier 884 by stage 2, followed a total of $N_{s=884,t=2} = 11$ courses, amongst which were courses 1, 2, and 104, and was assessed on soft skill 1 and 10, respectively, with scores of 4 and 3.

It is important to note that aside from the missing data at stage 0 from Cohort 2021, there were cases of soft skill scores which were not assessed during the internships, and were therefore treated as missing data for the models.

2.2 Modeling approach

Since our outcome of interest is an ordinal variable (i.e., ordered categorical data such as the levels of soft skill proficiency from Table 1), we use ordinal logistic regression. Its general form is

presented Equation 1, where Y is a variable with K categories. The cumulative probability $P(Y \leq k)$ is the probability of Y of being in category 1, 2, ..., or k . Furthermore, the odds of Y being less or equal to a k category is expressed by the ratio $\frac{P(Y \leq k)}{P(Y > k)}$. This model allows us to predict the probability, via a logit link function, of the K categories, totalling 100% with all the categories, based on the linear combination of the explanatory variables W .

$$\text{logit}(P(Y \leq k)) = \ln \left(\frac{P(Y \leq k)}{P(Y > k)} \right) = \alpha_{k0} - \sum_{i=1}^n \beta_i w_i \quad (1)$$

where $k = 1, 2, \dots, K - 1$

The α_{k0} intercepts represent the $K - 1$ thresholds needed to compare against the linear combination of effects [the probability of the last category $P(Y = K)$ is calculated by the complement, $1 - P(Y \leq K - 1)$]. The β parameters are fixed effects that, in our case, could very well describe the individual effects of courses, with the W being dummy binary variables that determine whether the students followed or not that particular course by that time. Nonetheless, this model would use only fixed effects, same for all students, and because some students may begin with different soft skill proficiency levels, random intercepts can be considered to account for the student's individual characteristics [i.e., by adding a random residual θ_s to the intercepts α_{k0} , with $\theta_s \sim N(0, \sigma_{\theta_s})$]. In this way, the probability of a student being assessed a soft skill proficiency category k would be a function of both the student's individual characteristic and the course history. Nonetheless, due to the relatively small size of the dataset compared to the amount of courses that can be chosen by students, it may be quite difficult to adequately estimate the effects of individual courses ($\beta_1, \dots, \beta_n$). Therefore, we consider a general course effect, and a random deviation of individual courses from this mean course effect. These random deviations are assumed to follow a random normal distribution. Because each of the courses can contribute to the soft skill proficiency, a multiple membership model was used (Hill and Goldstein, 1998).

Multiple membership models arose from the need of properly modeling data structures which do not accommodate traditional hierarchical data clusters. For instance, in our case, the soft skill scores for Leadership of student s belong to that student and no one else. This means that those scores are nested within

TABLE 3 Dataset structure.

Student id	Stage	W_1	W_2	...	W_{103}	W_{104}	N	$sskill_1$	...	$sskill_{10}$
1	0	0	0	...	0	0	0	2	...	1
1	1	0	1	...	1	0	6	3	...	2
1	2	1	1	...	1	0	11	3	...	3
2	0	0	0	...	0	0	0	1	...	2
2	1	1	0	...	0	0	4	3	...	3
...	...	...	...	...	...	...	...	...	...	...
883	1	0	1	...	0	0	5	3	...	2
883	2	0	1	...	1	0	11	3	...	4
884	0	0	0	...	0	0	0	1	...	2
884	1	0	1	...	0	0	6	3	...	2
884	2	1	1	...	0	1	11	4	...	3

students. Nonetheless, the same cannot be said regarding the relation between students and courses because students would follow multiple courses (and not just one), where each of them would have an effect on the students' soft skill scores. The students would therefore belong to multiple courses. Therefore, Multiple Membership Ordered Logistic regression models are used to explain the cumulative probability of soft skill proficiency of soft skill i from student s and stage t being classified in category k . It is important to remark that the linear combination of effects is performed in the logit scale, and can be either interpreted with odds or continuously in the logit scale. In addition, it is assumed the course effects remain the same throughout time (regardless of lecturer or syllabus changes) in order to limit the complexity of the models. Moreover, the models are uni-dimensional, in the sense that each soft skill is modeled separately thereby having an ensemble of 10 models explaining each a soft skill in particular.

Equation 2 describes the model where α_{0ik} represents the various thresholds against which the linear combination of effects are compared. β_i is the fixed average course effect (same for all students) on soft skill i , and N_{st} the number of courses followed by student s and stage t . u_{ic} is the random effect of course c on soft skill i whereas w_{cst} represents the contribution weights of the course random effects on soft skill i . Finally, θ_{is} is a random effect across students towards soft skill i .

$$\text{logit}(P(sskill_{ist} \leq k)) = \alpha_{0ik} - \beta_i N_{st} - \sum_{c=1}^C u_{ic} w_{cst} - \theta_{is} \quad (2)$$

where $k = 1, 2, 3$ represents the soft skill proficiency categories. Regarding the weights, $w_{cst} = 1$ if student s followed course c by stage t , otherwise it is equal to 0. Moreover, the random effects are assumed to follow normal distributions, $u_{ic} \sim N(0, \sigma_{ic})$ and $\theta_s \sim N(0, \sigma_{is})$.

Figure 1 shows a graphical representation of the model, following the visualizations of Generalized Linear Mixed Models by De Boeck and Wilson (2004). The probability of the soft skill of a student being assessed a certain proficiency category depends on the the linear combination, η_{ist} , linked to the expected outcome by a

logit link function. This η_{ist} results from the interplay between fixed and random variables from the courses as well as the individual characteristics of student s .

According to the model in Equation 2, if a student followed 4 courses with identifiers (7, 12, 29, 44), the general fixed effect β_i towards soft skill i would be multiplied by 4 and 4 random effects (one for each course identifier) would contribute to the overall effect of courses for this student. Since the weights of the random effects would be equal to 1 for those courses, the overall effect could be expressed as $\beta_i + u_{i7} + \dots + \beta_i + u_{i44}$. This means course effect c_i could be explained by the average course effect plus their individual random effects $\beta_i + u_{ic} w_{cst}$.

A previous study by Arreola and Wilson (2020) utilized a similar approach to the one of our models, albeit their models predicted dichotomous categorical academic performance, and not soft skills proficiency. They defined the outcome as success if students achieved a Grade Point Average greater than 2 or 3. Moreover, their models considered the students as members of multiple instructors or lecturers (where each student may have been affected by one or multiple instructors along their studies), whereas in our particular case, the students are considered multiple members of courses. This means that students follow various courses, and the students' course history varies in both in number and type (identifier) of courses.

2.3 Bayesian analysis

A Bayesian approach was used considering its flexibility in terms of model implementation. The software *Stan* by Carpenter et al. (2017), the R programming language (R Core Team, 2021), and the R package *RStan* by Stan Development Team (2023) were used to code, compile and fit the models to the data.

Since we have no previous data regarding course effects on soft skills, non-informative (i.e., priors that do not affect the posterior given their non-informative nature) and weakly-informative (i.e., priors that have a mild influence on the posterior distribution in order to keep the estimates in sensible ranges) were considered

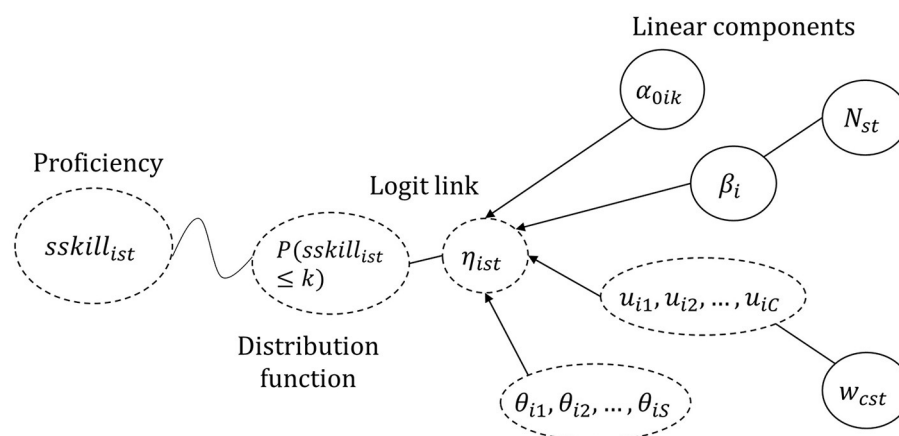


FIGURE 1

Schema of the model. The dotted circles represent random variables whereas the non-dotted circles represent fixed parameters and variables. η_{ist} is the linear combination of the α thresholds with the general fixed effect of the average course along with the random effects of courses (u_{ic}) and students (θ_{is}).

TABLE 4 Non-informative and weakly-informative priors for the model parameters.

Parameter	Prior distribution
β_i	$U(-\infty, +\infty)$
σ_{is}	$t(df = 3, \mu = 0, \sigma = 2.5)$
σ_{ic}	$t(df = 3, \mu = 0, \sigma = 2.5)$
u_{ic}	$\mathcal{N}(\mu = 0, \sigma = \sigma_{ic})$
θ_{is}	$\mathcal{N}(\mu = 0, \sigma = \sigma_{is})$

for all parameters. Table 4 shows the parameters priors, which were chosen based on the default priors in the R package *brms* by Bürkner (2018). A standard deviation $\sigma = 2.5$ is used for the priors of the standard deviations σ_{is} and σ_{ic} for both course and student random intercepts. It is important to add that σ_{is} and σ_{ic} are restrained to be positive in the Bayesian implementation.

Furthermore, the models were fitted with 4 chains, where each chain ran for 5,000 iterations and 1,000 burn-out samples, having a total of 16,000 post warm-up iterations per model fit. The models were fitted for each of the ten soft skill dimensions, resulting in several model fits. The empirical estimate $\hat{R}$ was equal to 1 for all fits, which suggests convergence.

2.4 Multiple imputation

In our experiment, multiple imputation was used to impute 5 times the soft skills missing data from stage 0 of the 2021 student cohort. The missing data from that stage and cohort comprised the soft skill scores. The imputation was made possible with a model that depends on the data from further stages (as well as stage 0 from the 2022 and 2023 cohorts) comprising the student and soft skill scores. Multiple imputation is a highly popular approach to handle missing data (Rubin, 1987, 1996). It comprises a range of techniques that allow to generate values

in order to fill in the missing data, based on other known variables from the dataset. We used the R package *mice* (van Buuren and Groothuis-Oudshoorn, 2011), which allows flexible implementations of various multiple imputation methods, such as predictive mean matching [imputation method proposed by Rubin and Schenker (1986); Little (1988) and used in our study]. By imputing several times the missing data, we end up with several datasets. These datasets would be similar with the only difference being the generated values corresponding to the 2021 students at stage 0. It is also important to note that by having multiple datasets, there would be various estimations (1 for each dataset) of the courses effects on the same soft skill dimension i . In this case, a course c would have 5 effects for soft skill i . Rubin's rule (Rubin, 1987), which was proposed to pool parameter results from multiple imputation, is used further in Section 3 to combine the different parameter estimates from the imputed datasets, and to account in the standard errors of the regression parameters for the uncertainty about the imputed values.

While the computational cost of multiple imputation is relatively low, the cost of estimating the model parameters with each of the imputed datasets is considerable. In a computer Intel(R) Core(TM) i7-10810U CPU @ 1.10GHz 1.61 GHz and 32 GB of RAM, the Bayesian estimation needed approximately 35 to 40 min to fit a model (by running the chains in parallel) given the current number of parameters and size of the dataset. This means that in order to estimate the effects (40 min $\times$ 5 imputed datasets $\times$ 10 soft skills), 2,000 min or approximately 33 h were necessary. Therefore, the number of imputed datasets was chosen to keep the overall computational cost feasible. Nonetheless, a higher number of imputations, in principle, would provide more robust estimations.

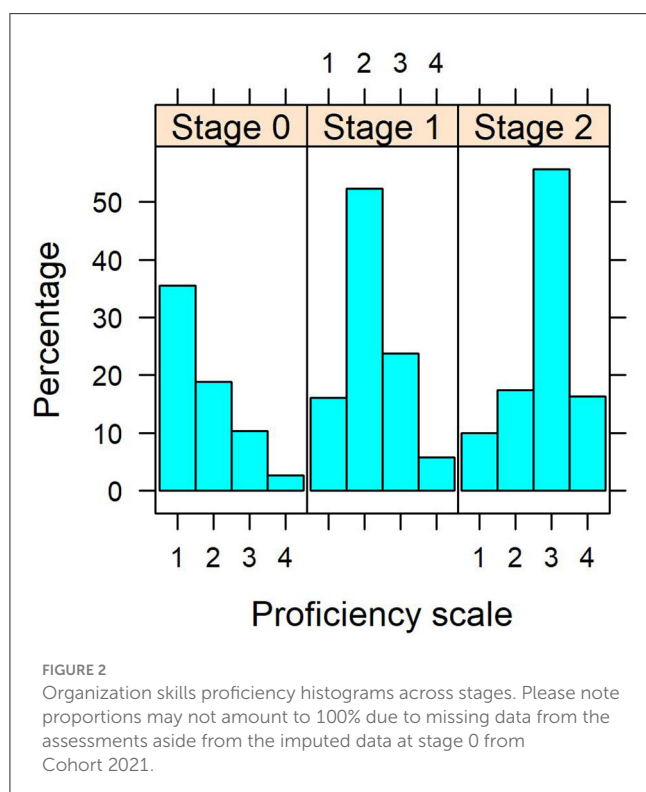
3 Results

Before interpreting the results, it is important to note that it should be done with caution given the complexity of the data as well as the considerable number of parameters to estimate, associated with a relatively low number of students (in comparison).

3.1 Descriptive results

3.1.1 Soft skill proficiency

The discrete distribution of all soft skill dimensions have similar tendencies regarding the probability of higher proficiency towards the end of the program. An example is shown in Figure 2, which depicts the histograms of the students' organization skill proficiency across stages. It can be seen that the distribution at stage 0 tends to be right skewed (more probability of the first soft skill scores), whereas stage 1 is less skewed and appears to be somewhat symmetric (more probability in the 2nd and 3rd levels). On the



other hand, stage 2 tends to have a left skewed distribution (higher probability of the last categories and lower on the first levels). This may suggest the probability of higher scores increases across stages.

A more detailed descriptive analysis of the soft skill proficiency across time is shown in Table 5. It can be seen that the highest average proficiency was observed for problem solving with average values of 2.43, 2.92, and 3.10 (on the 4-point scale) across the three stages. The lowest average proficiency was observed, at stage 0, for Organization, followed closely by Leadership. It can also be seen that several soft skills have lower standard deviations across the stages (e.g., Decision Making with 0.87 at stage 0, 0.74 at stage 1 and 0.66 at stage 2), although the decreasing trend presents itself in varying degrees. Moreover, the average change ($\Delta_{t+1,t}$) depicts the difference between the average proficiency at stage $t + 1$ and t . It can be noted that all these changes are positive, albeit some are very small at certain stages.

3.2 Multiple membership ordinal logistic regression results

Table 6 presents the pooled mean results from the imputed datasets on each of the soft skills. It can be seen that the average effect of attending an additional course in logit scales ranges from 0.11 in Communication to 0.27 in Leadership. This also means that for each average course (course whose effect does not deviate from the mean effect β_i , $u_{ic} = 0$) that an average student (student whose random intercept is equal to the 0 mean amongst all students, $\theta_{is} = 0$) follows, maintaining the other variables constant, the odds of having gained proficiency in leadership after attending the course ($e^{0.27} = 1.30$ or 30% increase) are greater than communication ($e^{0.11} = 1.12$ or 12% increase).

The standard deviations of the random effects of the courses range from 0.10 in Leadership to 0.26 in Stress Management. These values are considerably high given that β_i is measured on a logit scale. Given the assumption of a normal distribution approximately 95% of the course effects would be comprised within 1.96 standard deviations of the mean. For the case of Leadership, whose mean

TABLE 5 Average, standard deviation, and average changes $\Delta_{t+1,t}$ of the soft skill scores across stages.

Soft skill	Stage 0 Avg (SD)	Δ_{t1t0}	Stage 1 Avg (SD)	Δ_{t2t1}	Stage 2 Avg (SD)
Problem solving	2.43 (0.80)	+0.49	2.92 (0.77)	+0.18	3.10 (0.75)
Innovation	1.86 (0.97)	+0.57	2.43 (0.78)	+0.44	2.86 (0.74)
Organization	1.70 (0.87)	+0.50	2.20 (0.78)	+0.59	2.79 (0.84)
Adaptability	1.96 (0.89)	+0.43	2.39 (0.77)	+0.59	2.99 (0.72)
Communication	2.30 (0.83)	+0.58	2.87 (0.81)	+0.10	2.96 (0.79)
Project management	1.83 (0.63)	+0.16	2.00 (0.67)	+0.35	2.35 (0.83)
Conviction	2.08 (0.65)	+0.12	2.20 (0.73)	+0.45	2.65 (0.76)
Stress management	2.11 (0.83)	+0.73	2.84 (0.70)	+0.10	2.94 (0.70)
Leadership	1.73 (0.74)	+0.53	2.26 (0.71)	+0.34	2.60 (0.73)
Decision making	1.97 (0.87)	+0.41	2.38 (0.74)	+0.53	2.91 (0.66)

effect is 0.27, this interval would be defined between 0.074 and 0.466 [$0.27 - 1.96(0.10) = 0.074$, $0.27 + 1.96(0.10) = 0.466$]. Moreover, there are some soft skills such as Communication where the interval would comprise a substantial part below zero, which further suggests there can be huge differences between courses. Although on average there is a positive effect of attending a course, not all courses have such positive effects. Figure 3 shows the kernel density distributions of the random effects across courses towards Communication (red) and Leadership skills (blue) centered around their average course effects (β). First, it can be seen that both distributions resemble normal distributions, albeit Communication distribution reaches negative values in logit scales, which further suggest not all courses seem to have positive effects. Furthermore, the highest standard deviation of the random effects correspond to the students, where the minimum is 0.24 in Stress Management and the highest 0.43 in Innovation, suggesting even greater variability amongst students in terms of their initial soft skill proficiency.

Additionally, Figure 4 shows a heat map of the Pearson correlation between the course random residual effects across the

various soft skill dimensions. It can be seen that all soft skill dimensions are positively correlated, which means the course effects help develop in general all dimensions. Nonetheless, the coefficients display varying degrees of correlation. While several of the dimensions are considerably correlated ($\rho_{sskill_xsskill_y} > 0.40$), there are a few dimensions with lower correlation such as Project Management and Problem Solving ($\rho_{sskill_xsskill_y} = 0.13$), Project Management and Decision Making ($\rho_{sskill_xsskill_y} = 0.25$) and Project Management and Stress Management ($\rho_{sskill_xsskill_y} = 0.26$). There are also some highly correlated dimensions such as Organization and Adaptability ($\rho_{sskill_xsskill_y} = 0.74$), Communication and Leadership ($\rho_{sskill_xsskill_y} = 0.66$), and Organization and Conviction ($\rho_{sskill_xsskill_y} = 0.65$).

4 Discussion

The descriptive results suggest a positive evolution of the average soft skill proficiency of the engineering students across their curriculum. The discrete probability distribution of the soft skill proficiency changes throughout time, being positively skewed at the beginning of the course free-choice part of the program. This means that at the end of the third year, most students are in the first levels of soft skill proficiency. However, by the end of the program, the distribution becomes negatively skewed, and most students tend to be in the last levels of proficiency, which is mostly a good sign for the academic program.

The model results show Leadership to be the most positively affected soft skill by an average course, followed closely by Innovation and Stress Management. Moreover, the least positively affected soft skill is Communication, followed by Project Management. Furthermore, there is a considerable dispersion of course effects, which may suggest not all courses help students develop their soft skills with the same intensity. The correlation matrix of the random effects show that the course effects on soft skills are positively related, though there are varying degrees of correlation. This may suggest not all courses focus their pedagogical activities evenly on all soft skills. For instance, the modest correlation coefficient between Project Management and

TABLE 6 Pooled mean parameter results from the imputed dataset model fits (with the standard errors SE in parantheses).

Soft skill	β (SE)	Odds	σ_c	σ_s
Problem solving	0.18 (6.24e-5)	1.19	0.15	0.34
Innovation	0.24 (1.08e-4)	1.27	0.13	0.43
Organization	0.23 (4.38e-5)	1.26	0.16	0.36
Adaptability	0.22 (1.34e-4)	1.25	0.13	0.42
Communication	0.11 (7.42e-5)	1.12	0.24	0.36
Project management	0.14 (9.21e-6)	1.14	0.14	0.26
Conviction	0.14 (7.94e-5)	1.15	0.12	0.31
Stress management	0.25 (2.11e-5)	1.29	0.26	0.24
Leadership	0.27 (0)	1.30	0.10	0.32
Decision making	0.23 (2.86e-5)	1.26	0.11	0.38

Please note that all effects are in log-odd scales except the odds.

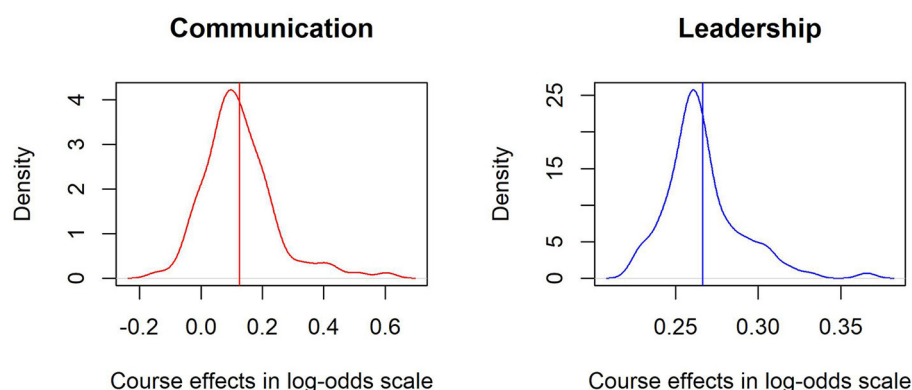


FIGURE 3

Kernel density plot of the course effects over Communication and Leadership skills. The vertical lines describe the pooled mean average course effect in the logit scale whereas the dispersion represents the variability amongst the individual effects of courses.

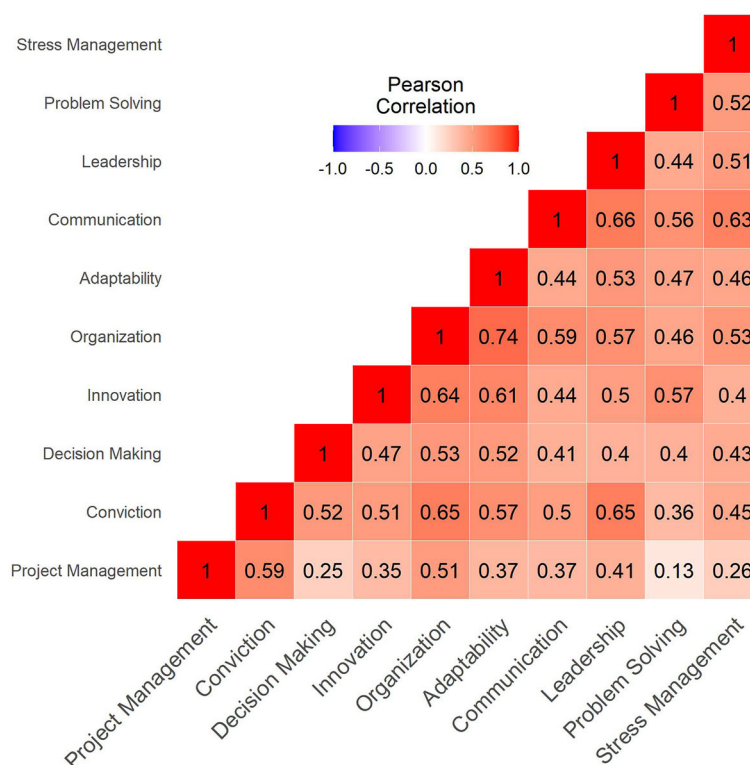


FIGURE 4

Correlation matrix of course random effects across soft skill dimensions. The higher the correlation the more red it becomes. Similarly, the less correlated, the less red it turns. Perfect linear correlations are depicted as fully red.

Problem Solving ($\rho_{sskill_{sskill_y} = 0.13$) suggest courses that strongly promote one of those soft skills may not necessarily support the other soft skill with the same intensity.

While other approaches such as Charoensap-Kelly et al. (2016) and Muukkonen et al. (2022) focus, respectively, on the perception of competence gain of individual courses and the change of behavior after following a training program, our approach is centered around the relation between courses and the soft skill proficiency of the students. That is, how the course history of the students can help us explain their soft skill proficiency. In addition, our approach leveraged the longitudinal assessments of soft skill proficiency of students throughout the academic program. Nevertheless, it is important to note that the assembly of the dataset, which comprises the longitudinal history of both soft skills and courses from 884 engineering students from 3 different cohorts, involves considerably high costs regarding logistics, time (at least the last 3 years in this case of a cohort of students), management, communication, data cleaning and pre-processing. Additionally, the importance of the dataset became even stronger given the non-availability of public datasets of a similar nature.

Nevertheless, there are several limitations to consider. First, we have to be prudent to interpret the estimated course effects as causal effects, since students were not randomly assigned to courses. The students chose their own courses, making the comparability amongst student groups a bit difficult. If the proficiency of a student group that followed a course increased considerably, we cannot

say that this is due to the course itself. It can be due to other kinds of activities that the students performed on top of the course (and that they would have done, even if they had followed another course). Second, the soft skill assessment is performed only once per year, making the dataset size quite difficult to enlarge longitudinally (in terms of soft skill assessments across time) unless these were performed between semesters. Third, due to convergence issues it is currently impossible to include fixed effects of courses as well as additional random effects corresponding to specializations and tutors (4 effects of specialization, their standard deviation, and 1608 tutors alongside their variance, which provides a total of 1,612 additional random effects and 2 variance parameters). Third, in favor of simplicity it is assumed the course effects remain the same regardless of lecturer, syllabus or pedagogical design changes across time, which may not necessarily be the case for most institutions. Fourth, HEI in Europe may contemplate semesters abroad (e.g., Erasmus exchange programs), which makes the integration of course history data across multiple institutions quite difficult.

5 Conclusions and future work

In this work, we answered our research questions by proposing the use of Multiple Membership ordinal logistic regression models to allow us to understand the relation between attending postgraduate courses and their effects

towards the soft skill proficiency of students. Moreover, we have shown practical methods that may provide great insight for HEI (such as IMT Nord Europe) interested in adapting their curriculum towards soft skills development. It is our hope that this article inspires practitioners and other researchers to further explore and propose other methodologies to model the effect the postgraduate courses on soft skills.

There are several alternatives that could be considered for future work. First, the addition of random intercept effects per specialization, which is not currently included due to the size of the dataset. Second, the inclusion of random intercept effects across internship tutors, who assess the students' soft skills proficiency. Third, the addition of the internship organization, and possibly categorize it by type (e.g., technological, pharmaceutical, clothing) in order to analyze whether the type of organization affects differently the soft skill proficiency of the students. Fourth, the study of the self-perception of their soft skills, and analyze whether these self-assessments correlate to the tutor-assessments. Finally, another strategy could be to study the relation between soft skills and not the courses themselves, but the pedagogical designs they are based on (e.g., problem, project, or simulation-based), which could reduce the complexity, and also provide valuable feedback for curriculum analysis. Nonetheless, it would require more work in discerning which methodologies are applied, and how close they are between the different courses in order to adequately define the weights of the multiple membership design, where students would be multiple members of one or various methodologies.

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 approval was not required for the study involving humans in accordance with the local legislation and institutional requirements. Written informed consent to participate in this study was not required from the participants or the participants' legal guardians/next of kin in accordance with the national legislation and the institutional requirements.

References

- Adams, R. J., Wilson, M., and Wang, W.-C. (1997). The multidimensional random coefficients multinomial logit model. *Appl. Psychol. Measur.* 21, 1–23. doi: 10.1177/0146621697211001
- Almeida, F., and Morais, J. (2021). Strategies for developing soft skills among higher engineering courses. *J. Educ.* 203, 103–112. doi: 10.1177/00220574211016417
- Almonte, R. (2021). *A Practical Guide to Soft Skills: Communication, Psychology, and Ethics for Your Professional Life*. London: Routledge, Taylor Francis Group. doi: 10.4324/9781003212942
- Arreola, E. V., and Wilson, J. R. (2020). Bayesian multiple membership multiple classification logistic regression model on student performance with random effects in university instructors and majors. *PLoS ONE* 15, 1–19. doi: 10.1371/journal.pone.0227343

Author contributions

LP: Conceptualization, Data curation, Formal analysis, Methodology, Writing – original draft, Writing – review & editing, Validation. AL: Methodology, Writing – review & editing. AK: Methodology, Writing – review & editing. MV: Methodology, Writing – review & editing. AF: Funding acquisition, Methodology, Supervision, Writing – review & editing. WV: Formal analysis, Methodology, Supervision, Validation, Writing – review & editing.

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Conflict of interest

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- Arvanitis, A., Touloumakos Anna K., Dimitropoulou, P., Vlemincx, E., Theodorou, M., and Panayiotou, G. (2022). Learning how to learn in a real-life context: Insights from expert focus groups on narrowing the soft-skills gap. *Eur. J. Psychol. Open* 81, 71–77. doi: 10.1024/2673-8627/a000027
- Barrie, S. C. (2007). A conceptual framework for the teaching and learning of generic graduate attributes. *Stud. High. Educ.* 32, 439–458. doi: 10.1080/03075070701476100
- Bürkner, P.-C. (2018). Advanced Bayesian multilevel modeling with the R package brms. *R J.* 10, 395–411. doi: 10.32614/RJ-2018-017
- Caccioliatti, L., Lee, S. H., and Molinero, C. M. (2017). Clashing institutional interests in skills between government and industry: an analysis of demand for technical and soft skills of graduates in the UK. *Technol. Forec. Soc. Change* 119, 139–153. doi: 10.1016/j.techfore.2017.03.024
- Caeiro Rodriguez, M., Manso Vázquez, M., Fernández, A., Llamas Nistal, M., Fernández Iglesias, M. J., Tsalapatas, H., et al. (2021). Teaching soft skills in engineering education: a European perspective. *IEEE Access* 9, 29222–29242. doi: 10.1109/ACCESS.2021.3059516
- Carpenter, B., Gelman, A., Hoffman, M. D., Lee, D., Goodrich, B., Betancourt, M., et al. (2017). Stan: a probabilistic programming language. *J. Stat. Softw.* 76, 1–32. doi: 10.18637/jss.v076.i01
- Chamorro-Premuzic, T., Artech, A., Bremner, A., Greven, C., and Furnham, A. (2010). Soft skills in higher education: importance and improvement ratings as a function of individual differences and academic performance. *Educ. Psychol.* 30, 221–241. doi: 10.1080/01443410903560278
- Charoensap-Kelly, P., Broussard, L., Lindsly, M., and Troy, M. (2016). Evaluation of a soft skills training program. *Bus. Profess. Commun. Quart.* 79, 154–179. doi: 10.1177/2329490615602090
- Council of the European Union (2018). *Key competences for lifelong learning*. Available online at: <https://op.europa.eu/en/publication-detail/-/publication/297a33c8-a1f3-11e9-9d01-01aa75ed71a1/language-en> (accessed December 15, 2023).
- De Boeck, P., and Wilson, M. (2004). “A framework for item response models,” in *Explanatory Item Response Models: A Generalized Linear and Nonlinear Approach* (New York, NY: Springer New York) 3–41. doi: 10.1007/978-1-4757-3990-9_1
- Ellis, M., Kislring, E., and Hackworth, R. (2014). Teaching soft skills employers need. *Commun. Coll. J. Res. Pract.* 38, 433–453. doi: 10.1080/10668926.2011.567143
- European Higher Education Area. (2016). *Bologna process: Employability of graduates*.
- Feraco, T., and Meneghetti, C. (2022). Sport practice, fluid reasoning, and soft skills in 10- to 18-year-olds. *Front. Hum. Neurosci.* 16. doi: 10.3389/fnhum.2022.857412
- Hartig, J., and Höhler, J. (2008). Representation of competencies in multidimensional IRT models with within-item and between-item multidimensionality. *Zeitschrift Psychol.* 216, 89–101. doi: 10.1027/0044-3409.216.2.89
- Hartig, J., and Höhler, J. (2009). Multidimensional IRT models for the assessment of competencies. *Stud. Educ. Eval.* 35, 57–63. doi: 10.1016/j.stueduc.2009.10.002
- Hill, P. W., and Goldstein, H. (1998). Multilevel modelling of educational data with cross-classification and missing identification for units. *J. Educ. Behav. Statist.* 23, 117–128. doi: 10.2307/1165317
- Hurrell, S. A., Scholarios, D., and Thompson, P. (2013). More than a “humpty dumpty” term: strengthening the conceptualization of soft skills. *Econ. Ind. Democr.* 34, 161–182. doi: 10.1177/0143831X1244934
- Jardim, J., Pereira, A., Vagos, P., Direito, I., and Galinha, S. (2022). The soft skills inventory: developmental procedures and psychometric analysis. *Psychol. Rep.* 125, 620–648. doi: 10.1177/0033294120979933
- Little, R. (1988). Missing-data adjustments in large surveys: Reply. *J. Bus. Econ. Stat.* 6, 300–301. doi: 10.2307/1391881
- Lord, F. M. (1952). A theory of test scores. *Psychom. Soc.* 7, 84.
- Muukkonen, H., Lakkala, M., Ilomäki, L., and Toom, A. (2022). Juxtaposing generic skills development in collaborative knowledge work competences and related pedagogical practices in higher education. *Front. Educ.* 7. doi: 10.3389/educ.2022.886726
- Novick, M., Birnbaum, A., and Lord, F. (1968). *Statistical Theories of Mental Test Scores*. Boston: Addison-Wesley.
- Novick, M. R., and Lewis, C. (1966). Coefficient alpha and the reliability of composite measurements. *ETS Res. Bull. Ser.* 1966, i-28. doi: 10.1002/j.2333-8504.1966.tb00356.x
- Partnership for 21st Century Skills (2007). *P 21 framework definitions*. Available online at: https://www.marietta.edu/sites/default/files/documents/21st_century_skills_standards_book_2.pdf (accessed December 15, 2023).
- R Core Team (2021). *R: A Language and Environment for Statistical Computing*. Vienna, Austria: R Foundation for Statistical Computing.
- Rasch, G. (1960). *Probabilistic models for some intelligence and attainment tests*. Danish Institute for Educational Research.
- Reckase, M. D. (2009). *Multidimensional Item Response Theory*. New York, NY: Springer Publishing Company, Incorporated, 1st edition. doi: 10.1007/978-0-387-89976-3
- Rubin, D. B. (1987). *Multiple Imputation for nonresponse in surveys*. Wiley series in probability and mathematical statistics. Applied probability and statistics. New York, NY: Wiley. doi: 10.1002/9780470316696
- Rubin, D. B. (1996). Multiple imputation after 18+ years. *J. Am. Stat. Assoc.* 91, 473–489. doi: 10.1080/01621459.1996.10476908
- Rubin, D. B., and Schenker, N. (1986). Efficiently simulating the coverage properties of interval estimates. *J. R. Stat. Soc. C* 35, 159–167. doi: 10.2307/2347266
- Salem, A. A. M. S. (2022). The impact of webquest-based sheltered instruction on improving academic writing skills, soft skills, and minimizing writing anxiety. *Front. Educ.* 7, 799513. doi: 10.3389/educ.2022.799513
- Stan Development Team (2023). RStan: the R interface to Stan. *R package version* 2.21.28.
- Succi, C., and Canovi, M. (2020). Soft skills to enhance graduate employability: comparing students and employers’ perceptions. *Stud. High. Educ.* 45, 1834–1847. doi: 10.1080/03075079.2019.1585420
- Touloumakos, A. K. (2020). Expanded yet restricted: A mini review of the soft skills literature. *Front. Psychol.* 11, 2207. doi: 10.3389/fpsyg.2020.02207
- Tuononen, T., Hyytinen, H., Kleemola, K., Hailikari, T., Männikkö, I., and Toom, A. (2022). Systematic review of learning generic skills in higher education—enhancing and impeding factors. *Front. Educ.* 7, 885917. doi: 10.3389/educ.2022.885917
- van Buuren, S., and Groothuis-Oudshoorn, K. (2011). Mice: multivariate imputation by chained equations in R. *J. Statist. Softw.* 45, 1–67. doi: 10.18637/jss.v045.i03
- van Ravenswaaij, H., Bouwmeester, R. A. M., van der Schaaf, M. F., Dilaver, G., van Rijen, H. V. M., and de Kleijn, R. A. M. (2022). The generic skills learning systematic: evaluating university students’ learning after complex problem-solving. *Front. Educ.* 7, 1007361. doi: 10.3389/educ.2022.1007361
- Xu, L., Zhang, J., Ding, Y., Sun, G., Zhang, W., Philbin, S. P., et al. (2022). Assessing the impact of digital education and the role of the big data analytics course to enhance the skills and employability of engineering students. *Front. Psychol.* 13, 974574. doi: 10.3389/fpsyg.2022.974574
- Ye, P., and Xu, X. (2023). A case study of interdisciplinary thematic learning curriculum to cultivate “4C skills”. *Front. Psychol.* 14, 1080811. doi: 10.3389/fpsyg.2023.1080811
- Zendler, A. (2019). cpm4.CSE/IRT: compact process model for measuring competences in computer science education based on IRT models. *Educ. Inf. Technol.* 24, 1–42. doi: 10.1007/s10639-018-9794-3



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EDITED BY

María del Mar Molero Jurado,
University of Almeria, Spain

REVIEWED BY

Stefania Mancone,
University of Cassino, Italy
Pierluigi Diotaiuti,
University of Cassino, Italy

*CORRESPONDENCE

Huilin Wang

✉ Huilin.Wang@ed.ac.uk

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Mindfulness and impulsive behavior: exploring the mediating roles of self-reflection and coping effectiveness among high-level athletes in Central China

Peili Liang¹, Hongyu Jiang¹, Huilin Wang^{2,3*} and Jiaxin Tang²

¹School of Physical Education, Hunan University of Science and Technology, Xiangtan, China, ²School of Business, Hunan University of Science and Technology, Xiangtan, China, ³Moray House School of Education, The University of Edinburgh, Edinburgh, United Kingdom

Introduction: In the highly competitive field of sports, impulsive behavior by athletes not only threatens personal and team harmony but also poses significant risks to their careers and public image. Despite these behaviors often becoming the focus of public attention, their underlying causes and prevention strategies remain relatively unknown. This study delves deep into the impact of mindfulness on athletes' impulsive behavior, revealing the mediating roles of self-reflection and coping effectiveness.

Methods: Using a combination of snowball and convenience sampling, a sample of 403 athletes from high-level sports teams in the Central China region participated in a questionnaire survey. The data were analyzed using Amos v.23 software.

Results: The findings indicate a positive correlation between mindfulness and coping effectiveness (standardized coefficient = 0.336, $p < 0.001$), as well as between self-reflection and coping effectiveness (standardized coefficient = 0.406, $p < 0.001$). There is a negative correlation between coping effectiveness and impulsive behavior (standardized coefficient = -0.476, $p < 0.001$). The positive impact of mindfulness on impulsive behavior (standardized coefficient = -0.371, $p < 0.01$) is mediated by self-reflection and coping effectiveness. The explanatory power of this study is $R^2 = 0.35$.

Discussion: Mindfulness reduces impulsive behavior by enhancing self-reflection capabilities and improving coping effectiveness. Based on these substantive research results, to mitigate impulsive behavior in athletes, it is recommended that the National Sports Administration and coaches actively implement mindfulness training. Additionally, targeted psychological intervention strategies should be developed to enhance athletes' mental health levels and optimize their sports performance.

KEYWORDS

athlete, mindfulness, self-reflection, coping effectiveness, impulsive behavior

1 Introduction

In the field of sports, athletes continuously push the boundaries of their physical capabilities and mental resilience. The intricate interplay between behavior and performance has always been a subject of keen exploration. Athletes, embodying discipline and dedication (Spiotta et al., 2018), relentlessly strive to enhance their athletic achievements and attain excellence, making it one of their foremost objectives (Dehghani et al., 2018). The lives of athletes are closely intertwined with the competitive arena, where they undergo rigorous training, endure physical ailments, and make sacrifices in their family and social lives, all in the pursuit of sporting perfection and outstanding achievements. However, this pursuit of excellence, at times, poses emotional and behavioral challenges, especially when athletes face the pressures and uncertainties of competitive sports.

Amidst the spotlight of victory and honor, a subtler aspect of their behavior has drawn the attention of researchers and practitioners – impulsive behavior. It is well-known that competitive sports often come with intense rivalry and immense pressure (Silva, 1990). This competitive nature in the sports domain ignites athletes' intrinsic ambitions and determination, driving them to continually surpass their limits for outstanding performance. However, accompanying this fierce competition are concerning issues, such as how athletes should cope with stress (Diotaiuti et al., 2021) and shield themselves from the impact of stressors (Diotaiuti et al., 2021), particularly regarding athletes' impulsive behavior, a problem that has garnered widespread attention among researchers (Parent and Fortier, 2017). Athletes' impulsive behaviors, especially those characterized by violence and aggression, both on and off the field, have been regarded as a societal issue (Tenenbaum et al., 1997). Moreover, most research on athlete violence and aggression has focused on the negative aspects of these behaviors (Kimble et al., 2010). This not only affects the sports domain but also has adverse effects on societal values and culture.

Relevant studies suggest that athletes of the same age group are more prone to aggression than non-athletes (Lenzi et al., 1997), indicating that athletes are more susceptible to impulsive behaviors. Such impulsive behaviors can tarnish the image of athletes in the public eye, leading to negative impressions among the public and the media (Brown et al., 2018). Athlete impulsive behavior extends beyond the realm of competition (Tenenbaum et al., 1997), challenging not only the behavioral codes upheld by sports organizations but also the essence of fair competition and mutual respect that underpins the spirit of sportsmanship. Therefore, it is necessary to explore methods to mitigate athlete impulsive behavior, with a foundation built on sound mental health.

Research has shown that mindfulness can enhance emotional regulation (Teper et al., 2013) and benefit mental health. In the realm of sports, mindfulness has been widely applied to improve athletes' psychological well-being (Anderson et al., 2021). Some studies have indicated that athletes' impulsive tendencies can be improved through interventions like mindfulness meditation (Sánchez-Sánchez et al., 2023). Although sport impulsions differ from athlete impulsive behavior, the research findings offer valuable insights for this study.

Previous research on athlete impulsive behavior has primarily focused on factors such as athlete's competitive anxiety (Terres-Barcala et al., 2022), psychological traits (Gabrys and Wontorczyk, 2022), technical performance (Lage et al., 2011), and also included studies on athletes with sports-related concussions (Liebel et al., 2021; Byrd et al.,

2022). The academic community has not thoroughly explored the relationship between athlete mindfulness and impulsive behavior. Additionally, shifting the research focus to Chinese athletes is expected to provide more specific and applicable results for the prevalent issues in the Chinese sports environment. Unlike previous research, this study delves into the potential relationship between athlete mindfulness and impulsive behavior, with a particular emphasis on the mediating roles of coping effectiveness and self-reflection. The former aids athletes in effectively dealing with various competitive pressures, while the latter assists athletes in gaining a deeper understanding of their thoughts, emotions, and behaviors. The interplay of these factors is crucial for understanding the formation and regulation of athlete impulsive behavior.

Given the gaps and issues in the aforementioned research landscape, this study aims to: (1) explore the relationships between mindfulness, self-reflection, coping effectiveness, and impulsive behavior to uncover potential mutual influences and interactions; (2) investigate potential synergies between mindfulness, self-reflection, and coping effectiveness, emphasizing their importance in athlete mental health; (3) ultimately provide targeted recommendations to reduce athlete impulsive behavior, promoting the healthy development of the sports domain.

This study centers on athlete impulsive behavior and proposes mindfulness as an intervention to improve it. The results suggest that self-reflection and coping effectiveness mediate the relationship between mindfulness and impulsive behavior. Mindfulness interventions enhance athletes' self-reflection and coping effectiveness, leading to a reduction in impulsive behavior. Therefore, understanding the impact of mindfulness on athlete impulsive behavior not only contributes to the theoretical development in relevant fields and societal concerns but also promotes athletes' outstanding performance in competitive sports, safeguarding their mental health and reducing the negative impact of impulsive behavior on both individuals and society as a whole. Additionally, it helps society better understand and support the psychological needs of athletes, playing a crucial role in shaping a positive sports culture and raising the ethical standards of the sports industry.

2 Literature review and hypothesis development

2.1 The concept of variables

2.1.1 Mindfulness

The term mindfulness originates from the Pali word “sati” in ancient texts, which translates to awareness, attention, and memory (Siegel et al., 2009). Over time, the definition of mindfulness has been appropriately adapted in the fields of psychology and medicine, encompassing a broader range of meanings. Baer (2003) proposed that mindfulness is linked to the unique attributes of attention and consciousness and can be cultivated through meditation. Building upon Kabat-Zinn (2003), a pioneer in the application of mindfulness-based therapies, defined mindfulness as the awareness that arises through paying attention, on purpose, in the present moment, non-judgmentally, to the unfolding of experience. Bishop et al. (2004) expanded on this definition, stating that mindfulness starts with regulating the focus of attention, bringing consciousness to

present-moment experiences, and observing and attending to the continually changing thoughts, emotions, and sensations.

Given that this study focuses on athletes, the definition of mindfulness employed in this research encompasses a mental state and conscious attitude. It emphasizes being fully present in the moment, attentively experiencing and being aware of one's sensations, thoughts, emotions, and the surrounding environment, all without judgment or bias.

2.1.2 Self-reflection

Self-reflection is regarded as a fundamental human trait and a cornerstone of advanced psychological functioning. Hilzensauer (2008), approaching it from a perspective of reflective learning, posits that self-reflection is the ability to connect personal strengths and limitations, take action with a critical attitude, and become aware of the challenges or potential opportunities in one's learning process. Lew and Schmidt (2011), looking at it through the lens of students and academic performance, describe self-reflection as a process where a learner reviews their past learning experiences, the actions they took to facilitate learning, and explores the connection between the knowledge taught and their own perceptions of that knowledge.

Drawing on the definition provided by Grant, Franklin (Grant et al., 2002), this study focuses on self-reflection in the context of athletes. Athletes are independent individuals, and therefore, in this research, we adopt Grant et al.'s definition of self-reflection, which involves examining and evaluating one's thoughts, emotions, and behaviors.

2.1.3 Coping effectiveness

Exceptional athletes require a set of coping skills to effectively deal with sources of pressure (Dugdale et al., 2002). In various athletic performances, an athlete's inability to cope effectively with stressors is considered one of the significant factors that can hinder their optimal performance (Lazarus, 2000). The concept of coping effectiveness has not received widespread research attention (Ntoumanis and Biddle, 1998). Nicholls, Holt (Nicholls et al., 2005) suggest that coping effectiveness can be evaluated based on short-term outcomes, such as an individual's ability to cope with specific stressors, or long-term outcomes, such as their overall adaptation over time. Folkman and Moskowitz (2004) argue that coping effectiveness needs to be assessed in relation to its application in specific stress situations, as a particular strategy may be effective in one context but ineffective in another. In summary, within the context of this study, coping effectiveness is defined as an individual's ability to cope with stressors, challenges, or adversities in a way that promotes emotional stability, psychological balance, and positive adaptation.

2.1.4 Impulsive behavior

Moeller, Barratt (Moeller et al., 2001) defined impulsivity as a tendency to react rapidly and without planning to internal or external stimuli, regardless of the negative consequences of these responses. Impulsive behaviors encompass a wide range of actions, including but not limited to alcohol dependence (Dick et al., 2010), substance abuse (Perry and Carroll, 2008; Argyriou et al., 2018), and antisocial behavior (Luengo et al., 1994). As this study focuses on athletes, the definition of impulsive behavior employed in this research draws from Moeller et al.'s definition, which characterizes impulsive behavior as

quick, unplanned reactions to internal or external stimuli, without consideration for the negative consequences of these responses.

2.2 Hypotheses

2.2.1 Mindfulness, self-reflection, and coping effectiveness

Mindfulness, in its traditional understanding, refers to purposefully focusing on the present moment without judgment (Lewis et al., 2022). Previous research has shown that mindfulness can cultivate self-awareness (Frieze et al., 2012; Lawlor, 2016; Berkovich-Ohana et al., 2019). This cultivated awareness deepens the observation and attention to one's thoughts, emotions, and bodily sensations. When athletes possess heightened mental awareness, they can observe their thoughts and emotions without becoming entangled in them, creating a conducive environment for self-reflection (Mohebi et al., 2022). Self-reflection involves the capacity for introspection and objective analysis of one's thoughts, behaviors, and decisions. In a sense, mindfulness forms the foundation for self-reflection by providing the necessary clarity and distance from immediate reactions (Wang et al., 2023).

In sports, athletes often need to analyze their performances, understand their mistakes, and adjust their strategies. Thus, by promoting mindfulness, athletes are more likely to engage in self-reflective behavior. Research suggests that Mindfulness-Acceptance-Commitment (MAC) interventions emphasize acceptance and non-reactivity, enabling individuals to cope with stress without being overwhelmed (Wong et al., 2022). Athletes frequently encounter high-pressure situations and substantial physical and mental challenges, from which they can benefit by cultivating this calmness. Coping effectiveness refers to the ability to manage and deal with stress in a way that promotes well-being and functional outcomes (Kaiseler et al., 2017). Mindfulness, by promoting non-reactivity, reduces impulsivity and potential harmful reactions, enhancing an individual's ability to cope with stress (Zou et al., 2020). Moreover, in a mindful state, athletes can choose how to respond to challenges rather than automatically react, making their coping strategies more deliberate and effective.

Self-reflection is the process of introspection and analysis of one's actions, decisions, and experiences (Kaiseler et al., 2012). Athletes who engage in regular self-reflection can better understand their sources of stress, identify triggers, and implement appropriate coping strategies (Dagnall et al., 2021). Through self-reflection, athletes gain insight into their strengths and weaknesses, making it easier to adopt the most effective coping strategies in any situation. Additionally, self-reflection enhances self-awareness, enabling athletes to proactively manage potential stressors or handle stress with higher skill (Modena et al., 2022). Over time, this proactive and thoughtful approach to facing challenges can improve an athlete's overall coping effectiveness. Hence, this study proposes the following hypotheses:

H1: Mindfulness has a positive and significant influence on self-reflection.

H2: Mindfulness has a positive and significant influence on coping effectiveness.

H3: Self-reflection has a positive and significant influence on coping effectiveness.

2.2.2 Self-reflection, coping effectiveness and impulsive behavior

Impulsivity is typically characterized by a lack of careful consideration and an inability to resist immediate temptations (Gabrys and Wontorczyk, 2022). On the other hand, self-reflection promotes a deeper understanding of one's actions, decisions, and motivations (González-Hernández et al., 2019). When athletes engage in self-reflection, they often gain a clear awareness of their past behaviors and the consequences of those actions. By continuously evaluating their choices and understanding the outcomes of impulsive behavior, they can better resist impulsive actions in the future. Additionally, self-reflection enhances awareness of one's own emotions and triggers (Kemp et al., 2019). Athletes who engage in self-reflection can identify situations or emotions that might lead to impulsive reactions, allowing them to proactively address these triggers or approach them with greater caution. The act of self-reflection itself requires slowing down and thinking, serving as a counterbalance to impulsive tendencies.

The underlying mechanisms that trigger impulsive behavior may stem from various neurocognitive and environmental factors, but their manifestation can be significantly modulated through coping mechanisms. In the field of sports psychology, the role of coping effectiveness is crucial, influencing an athlete's performance trajectory and overall well-being (Smith, 1986). The higher one's coping effectiveness, the better equipped they are to make informed assessments and responses to challenging situations, minimizing the tendency for impulsive reactions. Faced with an array of stimuli, whether they arise from opponent provocations or dynamic changes during a game, athletes with honed coping mechanisms can engage in cognitive assessments, ensuring that their reactions align with the immediacy of the situation and the overarching objectives (Gross, 1998). This cognitive mediation serves as a counter to impulsive tendencies, involving the evaluation of event significance, potential consequences of various responses, and the selection of the most appropriate course of action. This cognitive mediation can mitigate the immediacy of impulsive responses, promoting more thoughtful reactions that align with broader personal goals and situational contexts.

Furthermore, research suggests that effective coping strategies, such as problem-focused coping, emotion-focused coping, and utilizing social support, are associated with reducing impulsive tendencies under stressful conditions (Compas et al., 2001). After cultivation and implementation, these strategies enhance athletes' cognitive abilities, enabling them to navigate situations that might trigger impulsive behavior. Therefore, this study proposes Hypothesis 4 and Hypothesis 5:

H4: Self-reflection has a negative and significant impact on impulsive behavior.

H5: Coping effectiveness has a negative and significant impact on impulsive behavior.

2.2.3 The mediating effects

Mindfulness is rooted in present-moment awareness, providing athletes with a cognitive foundation to observe thoughts and emotions without immediately reacting. Research indicates that mindfulness practices can enhance attention control, emotional regulation, and self-awareness, laying the groundwork for subsequent behavioral processes (Bishop et al., 2004). Building upon the heightened awareness facilitated by mindfulness, self-reflection offers a conscious analysis of one's internal state. Moreover, engaging in self-reflection aids in understanding personal motivations, actions, and the potential consequences of those actions (Ryan and Deci, 2006). In the realm of sports, the combination of coping strategies with the ability to choose optimal responses and take corresponding actions can thwart impulsive behavior (Smith, 1986). Effective coping strategies can mitigate the impact of stressors that may trigger impulsive behavior. For instance, athletes with effective coping strategies may avoid impulsive decisions in high-pressure situations to prevent adverse effects on their performance (Nicholls and Polman, 2007). Therefore, this study proposes the following mediation hypothesis:

H6: Self-reflection and coping effectiveness mediate the relationship between mindfulness and impulsive behavior.

All hypotheses are depicted in Figure 1.

3 Materials and methods

3.1 Participants and procedure

This study employed a combination of snowball sampling and convenience sampling methods, targeting athletes from the Central China region. Researchers conducted a questionnaire survey on sports athletes in the Central China region from June to July 2023. To ensure the reliability of the data, researchers established contact with high-level sports team leaders from different provinces in the Central China region. After obtaining approval from these team leaders, the survey questionnaires were distributed to the athletes. Before completing the questionnaires, all respondents received explanations about the purpose of participating in the survey, signed informed consent forms, and pledged to keep the survey results strictly confidential. Based on this, the snowball method was used, and eligible team members shared the survey questionnaires among themselves. Upon completing the questionnaires, the researchers provided some small gifts (e.g., sports gloves, wristbands, knee pads, and other sports equipment) to express gratitude to the respondents. A total of 600 questionnaires were distributed, and by the end of July, 482 athletes had been surveyed. After excluding invalid questionnaires (due to abnormal data, missing information, blank responses, etc.), a total of 403 valid questionnaires were obtained, resulting in an effective response rate of 67.2%.

Table 1 presents the demographic characteristics of the 403 surveyed athletes. Among the respondents, (1) 60.3% were between the ages of 18 and 23; (2) males accounted for 64.5%, while females accounted for 35.5%; (3) team sports were the primary sports discipline (48.4%); (4) the majority of respondents (68.2%) had participated in sports competitions 1–3 times in the past 12 months. This data might be skewed due to the official lifting of COVID-19

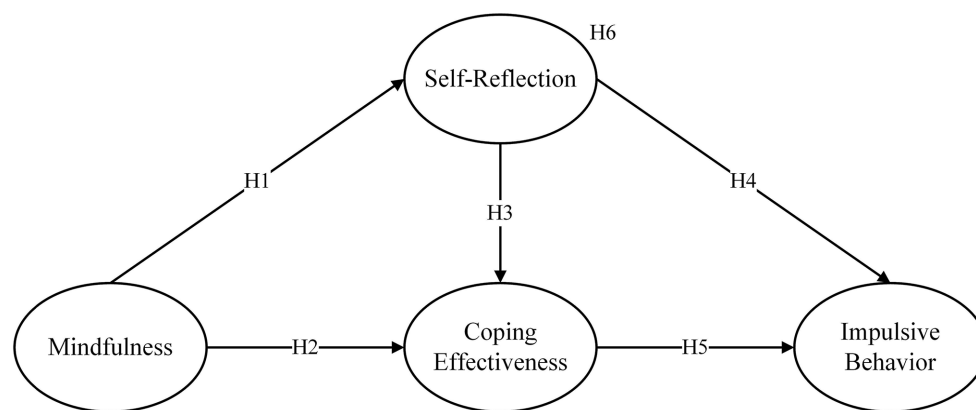


FIGURE 1
The hypothesized model.

TABLE 1 Participant profile ($N = 403$).

Profiles		Survey (%)
Respondents' age	<18	8.7
	18–20	24.1
	21–23	36.2
	>23	31.0
Respondents' gender	Male	64.5
	Female	35.5
Respondents' sports items	Ball sports	48.4
	Athletics projects	17.4
	Other sports	34.2
Respondents' sports events in the last 12 months	1–3	68.2
	4–6	14.7
	7–9	5.7
	>10	11.4

prevention and control measures in China on January 8, 2023, which meant that sports competitions could not take place normally before that date, and athletes were unable to participate in such events.

3.2 Measures

The questionnaire consisted of five sections. The first section required respondents to report demographic information, including age, gender, the sports discipline they were involved in, and the number of sports competitions they had participated in over the past 12 months. The second section collected data on mindfulness from the respondents, using five items from the scale developed by Feldman, Hayes (Feldman et al., 2007). Sample items included “It is easy for me to concentrate on what I am doing.” The third section gathered data on respondents' coping effectiveness, measured using four items from the scale developed by Gottlieb and Rooney (2004). Sample items included “I'm dealing with this problem better now than I used to.” The fourth section collected data on respondents' self-reflection, measured using four items from the scale developed by Naeimi,

Abbaszadeh (Naeimi et al., 2019). Sample items included “I often think about the way I feel about things.” Finally, the fifth section gathered data on respondents' impulsive behavior, measured using four items from the scale developed by Whiteside and Lynam (2001). Sample items included “Sometimes I do things on impulse that I later regret.” All of the above scales were measured using a Likert five-point scale, with response options ranging from 1 (strongly disagree) to 5 (strongly agree).

To adapt the scales to the Chinese cultural context and language, some items in the scales were modified by the researchers. Therefore, a pilot test was conducted to ensure the reliability of the modified scales (Kimberlin and Winterstein, 2008). The pilot test received a total of 96 valid questionnaires, and the results showed that Cronbach's alpha coefficients were all greater than 0.8, indicating that the researchers' appropriate modifications to the scales were reasonable and reliable.

3.3 Data analysis

This study utilized AMOS v.23 to construct a Structural Equation Model (SEM) aimed at examining the enhancement of impulse behavior through mindfulness among athletes. Model parameter estimation was conducted using the Maximum Likelihood (ML) estimation method. A two-step modeling approach was employed to assess both the measurement model and the structural model. Initially, a comprehensive evaluation of the model's reliability and validity was performed. Subsequently, fit indices and path coefficients of the hypothesized model were measured, along with an examination of the presence of mediating effects.

To mitigate potential issues stemming from common method variance (CMV) inherent in self-reported behaviors, the approach recommended by Mossholder, Bennett (Mossholder et al., 1998) was adopted by the researchers. In line with this, a comparison was undertaken between model one and model two, with a focus on assessing variations in degrees of freedom and chi-square values. The outcomes revealed that the chi-square value for model one amounted to 3345.003, encompassing 119 degrees of freedom and yielding a value of p below 0.001. Correspondingly, the chi-square value for model two stood at 230.992, accompanied by 113 degrees of

freedom and a value of p below 0.001. These findings affirm the proportional fit of model one to model two. Hence, it can be deduced that the absence of evidence supporting a univariate structure suggests the absence of concerns related to CMV within the scope of this study.

4 Results

4.1 Measurement model

The assessment of latent variables' reliability and validity involved the implementation of confirmatory factor analysis (CFA) utilizing AMOS v.23. All variables exhibited Cronbach's α values above 0.9 (refer to Table 2), affirming the robust internal consistency within the model structure (Fornell and Larcker, 1981). Furthermore, the average variance extraction (AVE) for each variable surpassed 0.6 (as indicated in Table 2), and the composite reliability (CR) of every latent variable exceeded 0.8, thereby attesting to the model's strong convergent validity. The robustness of convergence validity across the proposed models was well established. Factor loadings derived from principal component factor analysis ranged from 0.725 to 0.942 (see Table 2), underscoring the robust construct validity of the measurement model. Discriminant validity was established, as evidenced by the square root of the AVE along the diagonal exceeding the correlation between constructs (refer to Table 3).

4.2 Structural model

Upon scrutinizing the measurement model's reliability and validity, this investigation proceeded to analyze the structural model through the utilization of AMOS v.23 in order to substantiate the hypotheses. The outcomes of CFA, employing 5,000 bootstrap samples, consistently align with the recommended criteria ($\chi^2/\text{df}=2.739$, $\text{GFI}=0.918$, $\text{NFI}=0.955$, $\text{TLI}=0.965$, $\text{CFI}=0.971$, $\text{RMSEA}=0.066$), thus signifying an optimal fit between the model and the empirical data. Moreover, the outcomes of Pearson correlation are outlined in Table 3, corroborating the interconnectedness of the variables. The standardized coefficients for the structural equation model's variables are depicted in Figure 2. As illustrated in Figure 2, mindfulness exhibited a direct and positive correlation with self-reflection ($\beta=0.586$, $p<0.001$) and coping effectiveness ($\beta=0.336$, $p<0.001$), substantiating H1 and H2, respectively; self-reflection demonstrated a direct and affirmative correlation with coping effectiveness ($\beta=0.406$, $p<0.001$), thus supporting H3; concurrently, self-reflection exhibited a direct and adverse association with impulsive behavior ($\beta=-0.166$, $p<0.01$), affirming H4; lastly, coping effectiveness was found to directly and negatively correlate with impulsive behavior ($\beta=-0.476$, $p<0.001$), substantiating H5.

As Table 4 illustrates, the examination of mediating effects was carried out using bootstrap estimation with 5,000 resamples and 95% bias-corrected confidence intervals. The results distinctly underscore that the indirect effect of mindfulness on impulsive behavior, mediated through self-reflection and coping effectiveness, amounted to -0.371 [$\text{SE}=0.042$, $\text{CI}=(-0.450, -0.285)$, $p<0.01$], thus offering robust support for H6.

TABLE 2 Reliability and validity.

Items	Loadings	Cronbach's α	CR	AVE
<i>Mindfulness (MI)</i>		0.943	0.944	0.770
MI1	0.884			
MI2	0.839			
MI3	0.900			
MI4	0.877			
MI5	0.886			
<i>Self-reflection (SR)</i>		0.958	0.958	0.852
SR1	0.909			
SR2	0.942			
SR3	0.925			
SR4	0.915			
<i>Coping effectiveness (CE)</i>		0.905	0.898	0.691
CE1	0.725			
CE2	0.732			
CE3	0.923			
CE4	0.922			
<i>Impulsive behavior (IB)</i>		0.937	0.937	0.788
IB1	0.902			
IB2	0.862			
IB3	0.913			
IB4	0.873			

TABLE 3 Pearson correlation.

Construct	MI	SR	CE	IB
MI	(0.877)			
SR	0.559 **	(0.923)		
CE	0.510 **	0.529 **	(0.831)	
IB	-0.416 **	-0.430 **	-0.523 **	(0.888)

The square root of the AVE is in diagonals; off diagonals are a person's correlations of constructs. ** $p<0.01$.

5 Discussion

5.1 Theoretical contribution

This study contributes significantly to the theoretical analysis of impulsive behavior in athletes, making several noteworthy contributions. Firstly, prior research on athlete impulsivity has predominantly focused on aspects such as competitive anxiety (Terres-Barcala et al., 2022) and psychological characteristics (Gabrys and Wontorczyk, 2022). However, there has been limited exploration into the specific nature of athlete impulsive behavior. This study takes a novel approach by concentrating on the determinants of athlete impulsive behavior, offering a more targeted and enriched perspective within the existing theoretical framework. The researchers believe

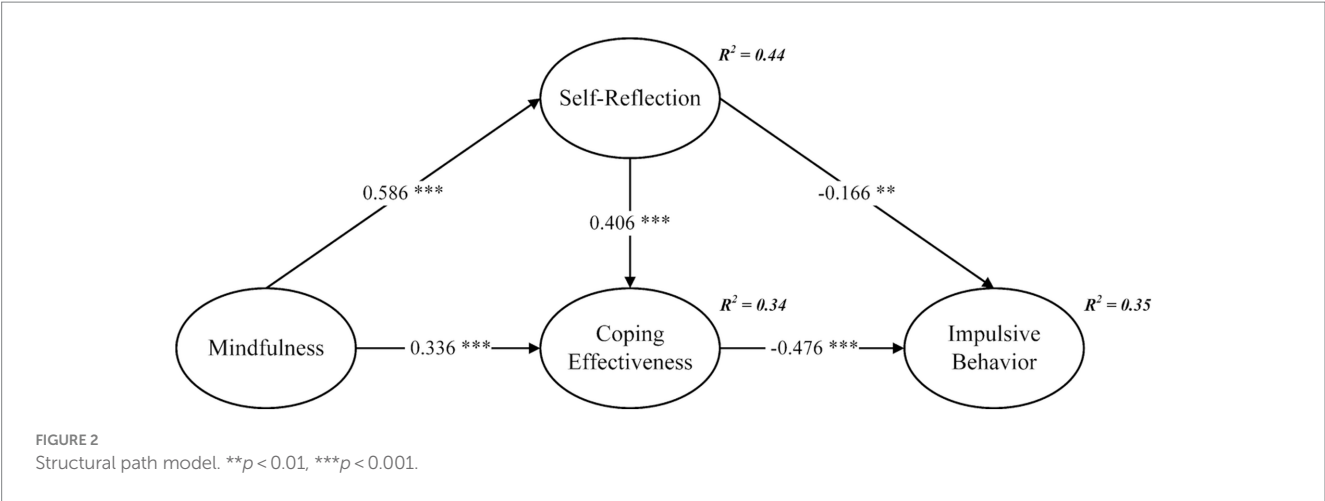


TABLE 4 Standardized indirect effect.

	Point estimate	Product of coefficients		Bootstrapping		
				Bias-corrected 95% CI		Two-tailed significance
		SE	Z	Lower	Upper	
MI → IB	−0.371	0.042	−8.833	−0.450	−0.285	0.01 (**)

that by investigating athlete impulsive behavior, they can identify critical factors that influence it, and subsequently propose solutions and interventions. Like previous studies, it is acknowledged that athletes are prone to impulsive behavior (Lenzi et al., 1997). However, this research goes a step further in asserting that the occurrence of athlete impulsive behavior is closely related to how athletes handle stress, especially considering the high-pressure environments inherent in their professional roles, which can impact their psychological resilience (Iso-Ahola, 1995). Additionally, factors such as injuries, aging, and other life stressors can exert additional psychological pressure on athletes. Unfortunately, many athletes tend to avoid seeking support for their mental well-being due to factors like shame, lack of awareness of the impact of psychological health on performance, and a perception that seeking help is a sign of weakness (Gulliver et al., 2012). Over time, this accumulated stress can manifest as impulsive behavior and, to some extent, risky behavior.

Secondly, this study pioneers the exploration of the relationship between mindfulness and athlete impulsive behavior. The results indicate a significant positive correlation between mindfulness and self-reflection/coping effectiveness (see Figure 2), supporting the findings of Möslér et al. (2022) and Kaiseler et al. (2017). Within the model developed in this study, mindfulness exerts the greatest influence on self-reflection, followed by coping effectiveness. Self-reflection and coping effectiveness mediate the relationship between mindfulness and impulsive behavior. As shown in Figure 2, these variables explain 35% of the variance in impulsive behavior. This study provides a valuable pathway for investigating the relationship between mindfulness and impulsive behavior, delving into the role of self-reflection at the psychological level. Additionally, it lends theoretical support to the study of mindfulness in athletes.

5.2 Practical implications

Considering the positive impact of mindfulness on self-reflection and coping effectiveness, as well as its indirect influence on reducing impulsive behavior in athletes, this study offers the following recommendations.

At the national level, the National Sports Bureau can take action on three fronts. Firstly, promote mindfulness training through extensive awareness campaigns. Launch large-scale publicity campaigns using various media platforms such as television, radio, social media, and ad slots during sporting events to emphasize the importance of mindfulness in sports (Brumitt et al., 2018). Collaborate with internationally renowned mindfulness training organizations and invite experts to conduct mindfulness courses in China, ensuring the introduction of the latest and most cutting-edge mindfulness education methods and materials. Recognize and reward teams or athletes who have successfully adopted mindfulness practices and achieved significant results, further motivating others to participate in mindfulness training. Secondly, develop and promote strategies for integration. Encourage sports teams at all levels to incorporate mindfulness training into their training routines, making it a standardized component of training. Establish dedicated teams to create, review, and disseminate official mindfulness materials and guidelines, ensuring their scientific rigor and practicality. Create an online platform offering mindfulness training videos, audio resources, and documents, making it convenient for coaches and athletes to learn and practice mindfulness anytime, anywhere. Thirdly, implement ongoing monitoring and evaluation. Set up standardized assessment systems, such as specially designed questionnaires and psychological tests, to regularly assess athletes' impulsive behavior and the effectiveness of mindfulness training (van Rensburg et al., 2015). Establish a central database to collect training, competition, and

mental health data from all athletes, enabling the analysis of the effects of mindfulness training on athletic performance. Based on the data collected and analysis results, make timely adjustments to the content and methods of mindfulness training to ensure its continued effectiveness and adaptability.

At the coach level, implement mindfulness training strategies in three ways. Firstly, actively engage in and practice mindfulness training. Participate in regular mindfulness workshops or seminars to stay updated on the latest research and applications of mindfulness in sports. Incorporate daily meditation and mindfulness exercises into your routine, building a solid foundation for guiding athletes in the future. Regularly exchange mindfulness practice experiences and insights with other coaches, exploring how to better integrate mindfulness into sports training. Secondly, integrate mindfulness into daily training. Before each training session, guide athletes through brief meditation or breathing exercises to help them focus their attention and prepare mentally. Utilize breaks in training, such as between skill and physical training, to allow athletes to engage in short mindfulness relaxation sessions to help them relax both physically and mentally. At the end of training, conduct a few minutes of relaxation meditation to help athletes alleviate fatigue and consolidate training content. Thirdly, provide regular mindfulness feedback to athletes. For example, schedule a weekly dedicated psychological communication session to listen to athletes' concerns and provide feedback on impulsive behavior. Conduct individual case analyses for athletes displaying impulsive behavior, gaining deeper insights into the underlying psychological factors, and offering corresponding mindfulness adjustment recommendations. Additionally, organize monthly team-sharing sessions where athletes can share their gains and experiences in mindfulness practice, learn together, and motivate each other.

Lastly, at the athlete's individual level, implement strategies in three ways. Firstly, actively engage in and deepen mindfulness practice. Establish a consistent daily meditation and mindfulness practice schedule, such as 10–15 min of meditation every morning or before bedtime. Utilize mindfulness-related mobile apps for guided meditation, making it convenient to practice mindfulness anytime, anywhere. Participate in collective meditation activities with teammates, encouraging and supporting each other's progress (Amnie, 2018). Secondly, engage in self-monitoring and reflection. Maintain a mental diary, recording impulsive behaviors, emotional responses, and daily experiences with mindfulness practice. This can help athletes gain a clearer understanding of their emotional patterns and behavioral habits. Set aside time each week or month for self-review and assessment of behavior, emotions, and progress in mindfulness practice. Thirdly, seek support and help promptly. When feeling that emotions or impulsive behavior are becoming difficult to control, communicate with the coach for professional advice and guidance. When necessary, consider seeking help from mental health experts through psychological counseling to gain a deeper understanding of emotional and behavioral patterns and receive more specialized guidance and recommendations. Share experiences and challenges with teammates, listen to their opinions and suggestions, and collectively explore how to better utilize mindfulness to improve performance and reduce impulsive behavior.

In summary, these specific recommendations for the National Sports Bureau, coaches, and athletes themselves will greatly contribute to mitigating impulsive behavior in athletes.

6 Conclusion

According to the research objectives, the findings of this study reveal that mindfulness, self-reflection, and coping effectiveness play crucial roles in controlling impulsive behavior among athletes. Specifically, mindfulness positively contributes to reducing impulsive behavior among athletes, and this effect is mediated by two intermediary variables: self-reflection and coping effectiveness. Through mindfulness training, athletes can better navigate competitive pressure, enhance self-reflection skills, and further bolster coping effectiveness. This series of positive effects aids athletes in better understanding and managing their emotions and behaviors, ultimately reducing impulsive actions.

Therefore, we strongly recommend athletes consider incorporating mindfulness training into their daily routines and lives as a significant preventive measure against impulsive behavior. Furthermore, coaches and relevant sports organizations should prioritize the mental health of athletes. Providing mental health support, training in emotional management skills, and guidance in mindfulness training can help athletes better cope with challenges, reduce competitive pressure, and minimize impulsive behavior. In the end, these efforts not only benefit athletes' personal growth and athletic performance but also contribute to shaping a healthier and more positive sports culture.

This study has several limitations that should be acknowledged. Firstly, the study did not employ random sampling, posing a slight limitation in the sample selection (Diotaiuti et al., 2020), which could introduce some bias into the sample. To ensure broader representativeness of the sample, future research should consider the use of random sampling techniques. Moreover, the specificity of the sample (Diotaiuti et al., 2021), limited to the central China region, should be noted. Secondly, this study did not incorporate moderator variables, such as the type of sport or the athletes' anxiety levels, into the research model. Additionally, athletes selected were not queried beforehand about whether they had received mindfulness training (Diotaiuti et al., 2023). Therefore, future research should include these moderator variables to obtain a more comprehensive understanding of the subject. Additionally, considering that an increased sample size could enhance the study's persuasiveness, it is recommended that future research expand the sample range.

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 School of Physical Education of Hunan University of Science and Technology (No. ECBPEHNUST 2022/0012). 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

PL: Conceptualization, Investigation, Methodology, Writing – original draft, Writing – review & editing. HJ: Investigation, Resources, Writing – original draft, Writing – review & editing. HW: Conceptualization, Project administration, Writing – original draft, Writing – review & editing. JT: Investigation, Writing – original draft, Writing – review & editing.

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References

- Amnie, A. G. (2018). Emerging themes in coping with lifetime stress and implication for stress management education. *SAGE Open Med.* 6:205031211878254. doi: 10.1177/2050312118782545
- Anderson, S. A., Haraldsdottir, K., and Watson, D. (2021). Mindfulness in athletes. *Curr. Sports Med. Rep.* 20, 655–660. doi: 10.1249/JSR.0000000000000919
- Argyriou, E., Um, M., Carron, C., and Cyders, M. A. (2018). Age and impulsive behavior in drug addiction: a review of past research and future directions. *Pharmacol. Biochem. Behav.* 164, 106–117. doi: 10.1016/j.pbb.2017.07.013
- Baer, R. A. (2003). Mindfulness training as a clinical intervention: a conceptual and empirical review. *Clin. Psychol.* 10, 125–143. doi: 10.1093/clipsy.bpg015
- Berkovich-Ohana, A., Jennings, P. A., and Lavy, S. (2019). “Chapter 15 - contemplative neuroscience, self-awareness, and education” in *Prog brain res.* ed. N. Srinivasan (244: Elsevier), 355–385.
- Bishop, S. R., Lau, M., Shapiro, S., Carlson, L., Anderson, N. D., Carmody, J., et al. (2004). Mindfulness: a proposed operational definition. *Clin. Psychol.* 11, 230–241. doi: 10.1093/clipsy.bph077
- Brown, K. A., Murphy, B., and Maxwell, L. C. (2018). Tried in the court of public opinion: effects of involvement in criminal transgressions on athlete image. *Commun. Sport* 6, 283–307. doi: 10.1177/2167479517697426
- Brumitt, J., Engilis, A., Mattocks, A., Ellis, N., and Reyes, J. (2018). Comparison of jump and hop test measures between NAIA and division III male collegiate basketball players. *Athl. Train. Sports Health Care* 10, 208–216. doi: 10.3928/19425864-20180306-01
- Byrd, M. M., Kontos, A. P., Eagle, S. R., and Zizzi, S. (2022). Preliminary evidence for a relationship between anxiety, anger, and impulsivity in collegiate athletes with sport-related concussion. *J. Clin. Sport Psychol.* 16, 89–108. doi: 10.1123/jcsp.2020-0003
- Compas, B. E., Connor-Smith, J. K., Saltzman, H., Thomsen, A. H., and Wadsworth, M. E. (2001). Coping with stress during childhood and adolescence: problems, progress, and potential in theory and research. *Psychol. Bull.* 127, 87–127. doi: 10.1037/0033-2909.127.1.87
- Dagnall, N., Drinkwater, K. G., Denovan, A., and Walsh, R. S. (2021). The potential benefits of non-skills training (mental toughness) for elite athletes: coping with the negative psychological effects of the COVID-19 pandemic. *Front. Sports Act. Liv.* 3:581431. doi: 10.3389/fspor.2021.581431
- Dehghani, M., Saf, A. D., Vosoughi, A., Tebbenouri, G., and Zarnagh, H. G. (2018). Effectiveness of the mindfulness-acceptance-commitment-based approach on athletic performance and sports competition anxiety: a randomized clinical trial. *Electron. Physician* 10, 6749–6755. doi: 10.19082/6749
- Dick, D. M., Smith, G., Olsson, P., Mitchell, S. H., Leeman, R. F., O'Malley, S. S., et al. (2010). Understanding the construct of impulsivity and its relationship to alcohol use disorders. *Addict. Biol.* 15, 217–226. doi: 10.1111/j.1369-1600.2009.00190.x
- Diotaiuti, P., Corrado, S., Mancone, S., and Falese, L. (2021). Resilience in the endurance runner: the role of self-regulatory modes and basic psychological needs. *Front. Psychol.* 11:558287. doi: 10.3389/fpsyg.2020.558287
- Diotaiuti, P., Corrado, S., Mancone, S., Falese, L., Dominski, F. H., and Andrade, A. (2021). An exploratory pilot study on choking episodes in archery. *Front. Psychol.* 12:585477. doi: 10.3389/fpsyg.2021.585477
- Diotaiuti, P., Falese, L., Mancone, S., Corrado, S., Mallia, L., Zelli, A., et al. (2020). Psychometric properties and reliability of the referee self-efficacy scale (REFS) in volleyball referees. *Int. J. Environ. Res. Public Health* 17:8423. doi: 10.3390/ijerph17228423
- Diotaiuti, P., Valente, G., Corrado, S., and Mancone, S. (2023). Assessing decentering capacity in athletes: a moderated mediation model. *Int. J. Environ. Res. Pub. Health* 20, 3324. doi: 10.3390/ijerph20043324
- Dugdale, J. R., Eklund, R. C., and Gordon, S. (2002). Expected and unexpected stressors in major international competition: appraisal, coping, and performance. *Sport Psychol.* 16, 20–33. doi: 10.1123/tsp.16.1.20
- Feldman, G., Hayes, A., Kumar, S., Greeson, J., and Laurenceau, J.-P. (2007). Mindfulness and emotion regulation: the development and initial validation of the cognitive and affective mindfulness scale-revised (CAMS-R). *J. Psychopathol. Behav. Assess.* 29, 177–190. doi: 10.1007/s10862-006-9035-8
- Folkman, S., and Moskowitz, J. T. (2004). Coping: pitfalls and promise. *Annu. Rev. Psychol.* 55, 745–774. doi: 10.1146/annurev.psych.55.090902.141456
- Fornell, C., and Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *J. Mark. Res.* 18, 39–50. doi: 10.1177/002224378101800104
- Frieze, M., Messner, C., and Schaffner, Y. (2012). Mindfulness meditation counteracts self-control depletion. *Conscious. Cogn.* 21, 1016–1022. doi: 10.1016/j.concog.2012.01.008
- Gabrys, K., and Wontorczyk, A. (2022). A psychological profile of elite polish short track athletes: an analysis of temperamental traits and impulsiveness. *Int. J. Environ. Res. Public Health* 19:3446. doi: 10.3390/ijerph19063446
- González-Hernández, J., Capilla Díaz, C., and Gómez-López, M. (2019). Impulsiveness and cognitive patterns. Understanding the perfectionistic responses in Spanish competitive junior athletes. *Front. Psychol.* 10:1605. doi: 10.3389/fpsyg.2019.01605
- Gottlieb, B. H., and Rooney, J. (2004). Coping effectiveness: determinants and relevance to the mental health and affect of family caregivers of persons with dementia. *Aging Ment. Health* 8, 364–373. doi: 10.1080/13607860410001709719
- Grant, A. M., Franklin, J., and Langford, P. (2002). The self-reflection and insight scale: a new measure of private self-consciousness. *Soc. Behav. Pers.* 30, 821–835. doi: 10.2224/sbp.2002.30.8.821
- Gross, J. J. (1998). The emerging field of emotion regulation: an integrative review. *Rev. Gen. Psychol.* 2, 271–299. doi: 10.1037/1089-2680.2.3.271
- Gulliver, A., Griffiths, K. M., and Christensen, H. (2012). Barriers and facilitators to mental health help-seeking for young elite athletes: a qualitative study. *BMC Psychiatry* 12, 1–14. doi: 10.1186/1471-244X-12-157
- Hilzensauer, W. (2008). Theoretische Zugänge und Methoden zur Reflexion des Lernens. *Ein Diskussionsbeitrag. bildungsforschung.*:2.
- Iso-Ahola, S. (1995). Intrapersonal and interpersonal factors in athletic performance. *Scand. J. Med. Sci. Sports* 5, 191–199. doi: 10.1111/j.1600-0838.1995.tb00035.x
- Kabat-Zinn, J. (2003). Mindfulness-based interventions in context: past, present, and future. *Clin. Psychol.* 10, 144–156. doi: 10.1093/clipsy.bpg016
- Kaiseler, M., Polman, R. C., and Nicholls, A. R. (2012). Effects of the big five personality dimensions on appraisal coping, and coping effectiveness in sport. *Eur. J. Sport Sci.* 12, 62–72. doi: 10.1080/17461391.2010.551410
- Kaiseler, M., Poolton, J. M., Backhouse, S. H., and Stanger, N. (2017). The relationship between mindfulness and life stress in student-athletes: the mediating role of coping effectiveness and decision rumination. *Sport Psychol.* 31, 288–298. doi: 10.1123/tsp.2016-0083
- Kemp, E., Sadeh, N., and Baskin-Sommers, A. (2019). A latent profile analysis of affective triggers for risky and impulsive behavior. *Front. Psychol.* 9:2651. doi: 10.3389/fpsyg.2018.02651

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- Kimberlin, C. L., and Winterstein, A. G. (2008). Validity and reliability of measurement instruments used in research. *Am. J. Health Syst. Pharm.* 65, 2276–2284. doi: 10.2146/ajhp070364
- Kimble, N. B., Russo, S. A., Bergman, B. G., and Galindo, V. H. (2010). Revealing an empirical understanding of aggression and violent behavior in athletics. *Aggress. Violent Behav.* 15, 446–462. doi: 10.1016/j.avb.2010.08.001
- Lage, G. M., Gallo, L. G., Cassiano, G. J., Lobo, I. L., Vieira, M. V., Fuentes, D., et al. (2011). Correlations between impulsivity and technical performance in handball female athletes. *Psychol.* 2, 721–726. doi: 10.4236/psych.2011.27110
- Lawlor, M. S. (2016). “Mindfulness and social emotional learning (SEL): a conceptual framework” in *Handbook of mindfulness in education: Integrating theory and research into practice*, 65–80.
- Lazarus, R. S. (2000). How emotions influence performance in competitive sports. *Sport Psychol.* 14, 229–252. doi: 10.1123/tsp.14.3.229
- Lenzi, A., Bianco, I., Milazzo, V., Placidi, G. F., Castrogiovanni, P., and Becherini, D. (1997). Comparison of aggressive behavior between men and women in sport. *Percept. Mot. Skills* 84, 139–145. doi: 10.2466/pms.1997.84.1.139
- Lew, M. D. N., and Schmidt, H. G. (2011). Self-reflection and academic performance: is there a relationship? *Adv. Health Sci. Educ.* 16, 529–545. doi: 10.1007/s10459-011-9298-z
- Lewis, K. J., Walton, C. C., Slemp, G. R., and Osborne, M. S. (2022). Mindfulness and nonattachment-to-self in athletes: can letting go build well-being and self-actualization? *Mindfulness* 13, 2738–2750. doi: 10.1007/s12671-022-01990-9
- Liebel, S. W., Edwards, K. A., and Broglio, S. P. (2021). Sensation-seeking and impulsivity in athletes with sport-related concussion. *Curr. Psychiatry Rep.* 23, 1–6. doi: 10.1007/s11920-021-01232-0
- Luengo, M., Carrillo-de-la-Peña, M. T., Otero, J., and Romero, E. (1994). A short-term longitudinal study of impulsivity and antisocial behavior. *J. Pers. Soc. Psychol.* 66, 542–548. doi: 10.1037/0022-3514.66.3.542
- Modena, R., Bisagno, E., Schena, F., Carazzato, S., and Vitali, F. (2022). How do elite female athletes cope with symptoms of their premenstrual period? A study on rugby union and football players’ perceived physical ability and well-being. *Int. J. Environ. Res. Pub. Health* 19:11168. doi: 10.3390/ijerph191811168
- Moeller, F. G., Barratt, E. S., Dougherty, D. M., Schmitz, J. M., and Swann, A. C. (2001). Psychiatric aspects of impulsivity. *Am. J. Psychiatry* 158, 1783–1793. doi: 10.1176/appi.ajp.158.11.1783
- Mohebi, M., Sadeghi-Bahmani, D., Zarei, S., Gharayagh Zandi, H., and Brand, S. (2022). Examining the effects of mindfulness-acceptance-commitment training on self-compassion and grit among elite female athletes. *Int. J. Environ. Res. Pub. Health* 19:134. doi: 10.3390/ijerph19010134
- Mösler, T., Poppek, S., Leonhard, C., and Collet, W. (2022). Reflective skills, empathy, wellbeing, and resilience in cognitive-behavior therapy trainees participating in mindfulness-based self-practice/self-reflection. *Psychol. Rep.* 126, 2648–2668. doi: 10.1177/00332941221094482
- Mossholder, K. W., Bennett, N., Kemery, E. R., and Wesolowski, M. A. (1998). Relationships between bases of power and work reactions: the mediational role of procedural justice. *J. Manag.* 24, 533–552. doi: 10.1177/014920639802400404
- Naeimi, L., Abbaszadeh, M., Mirzazadeh, A., Sima, A. R., Nedjat, S., and Hejri, S. M. (2019). Validating self-reflection and insight scale to measure readiness for self-regulated learning. *J. Edu. Health Promot.*:8.
- Nicholls, A. R., Holt, N. L., and Polman, R. C. (2005). A phenomenological analysis of coping effectiveness in golf. *Sport Psychol.* 19, 111–130. doi: 10.1123/tsp.19.2.111
- Nicholls, A. R., and Polman, R. C. J. (2007). Coping in sport: a systematic review. *J. Sports Sci.* 25, 11–31. doi: 10.1080/02640410600630654
- Ntoumanis, N., and Biddle, S. J. H. (1998). The relationship of coping and its perceived effectiveness to positive and negative affect in sport. *Pers. Individ. Differ.* 24, 773–788. doi: 10.1016/S0191-8869(97)00240-7
- Parent, S., and Fortier, K. (2017). Prevalence of interpersonal violence against athletes in the sport context. *Curr. Opin. Psychol.* 16, 165–169. doi: 10.1016/j.copsyc.2017.05.012
- Perry, J. L., and Carroll, M. E. (2008). The role of impulsive behavior in drug abuse. *Psychopharmacology* 200, 1–26. doi: 10.1007/s00213-008-1173-0
- Ryan, R. M., and Deci, E. L. (2006). Self-regulation and the problem of human autonomy: does psychology need choice, self-determination, and will? *J. Pers.* 74, 1557–1586. doi: 10.1111/j.1467-6494.2006.00420.x
- Sánchez-Sánchez, L. C., Franco, C., Amutio, A., García-Silva, J., and González-Hernández, J. (2023). Influence of mindfulness on levels of impulsiveness, moods and pre-competition anxiety in athletes of different sports. *Healthcare* 11: 898. doi: 10.3390/healthcare11060898
- Siegel, R. D., Germer, C. K., and Olendzki, A. (2009). *Mindfulness: What is it? Where did it come from? Clinical handbook of mindfulness*. Springer, New York, NY. (2009). 17–35.
- Silva, J. M. III. (1990). An analysis of the training stress syndrome in competitive athletics. *J. Appl. Sport Psychol.* 2, 5–20. doi: 10.1080/10413209008406417
- Smith, R. E. (1986). Toward a cognitive-affective model of athletic burnout. *J. Sport Exerc. Psychol.* 8, 36–50. doi: 10.1123/jsp.8.1.36
- Spiotto, A. M., Buchholz, A. L., Pierce, A. K., Dahlkoetter, J., and Armonda, R. (2018). The neurosurgeon as a high-performance athlete: parallels and lessons learned from sports psychology. *World Neurosurg.* 120, e188–e193. doi: 10.1016/j.wneu.2018.08.013
- Tenenbaum, G., Singer, R. N., Stewart, E., and Duda, J. (1997). Aggression and violence in sport: an ISSP position stand. *Sport Psychol.* 11, 1–7. doi: 10.1123/tsp.11.1.1
- Teper, R., Segal, Z. V., and Inzlicht, M. (2013). Inside the mindful mind: How mindfulness enhances emotion regulation through improvements in executive control. *Curr. Dir. Psychol. Sci.* 22, 449–454. doi: 10.1177/0963721413495869
- Terres-Barcala, L., Albaladejo-Blázquez, N., Aparicio-Ugarriza, R., Ruiz-Robledillo, N., Zaragoza-Martí, A., and Ferrer-Cascales, R. (2022). Effects of impulsivity on competitive anxiety in female athletes: the mediating role of mindfulness trait. *Int. J. Environ. Res. Public Health* 19:3223. doi: 10.3390/ijerph19063223
- van Rensburg, D. C. J., van Rensburg, A. J., Oguz, H., Fletcher, L., and Grant, C. C. (2015). The use of negative pressure wave treatment in athlete recovery: 2134 board# 12 may 28, 5: 45 PM-6: 45 PM. *Med. Sci. Sports Exerc.* 47:574. doi: 10.1249/01.mss.0000478274.49816.26
- Wang, Y., Lei, S.-M., and Fan, J. (2023). Effects of mindfulness-based interventions on promoting athletic performance and related factors among athletes: a systematic review and meta-analysis of randomized controlled trial. *Int. J. Environ. Res. Pub. Health* 20:2038. doi: 10.3390/ijerph20032038
- Whiteside, S. P., and Lynam, D. R. (2001). The five factor model and impulsivity: using a structural model of personality to understand impulsivity. *Pers. Individ. Differ.* 30, 669–689. doi: 10.1016/S0191-8869(00)00064-7
- Wong, R., How, P., and Cheong, J. (2022). The effectiveness of a mindfulness training program on selected psychological indices and sports performance of sub-elite squash athletes. *Front. Psychol.* 13:906729. doi: 10.3389/fpsyg.2022.906729
- Zou, Y., Li, P., Hofmann, S. G., and Liu, X. (2020). The mediating role of non-reactivity to mindfulness training and cognitive flexibility: a randomized controlled trial. *Front. Psychol.* 11:1053. doi: 10.3389/fpsyg.2020.01053



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EDITED BY

María del Mar Molero Jurado,
University of Almeria, Spain

REVIEWED BY

Cristian Ramos-Vera,
Cesar Vallejo University, Peru
Kay Brauer,
Martin Luther University of Halle-Wittenberg,
Germany

*CORRESPONDENCE

Daiva Daukantaitė
✉ daiva.daukantaitė@psy.lu.se

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Evaluating the psychometric properties of the Swedish version of the Impostor Profile scale (IPP30)

Vini Doshi, Marijn Antens and Daiva Daukantaitė *

Department of Psychology, Lund University, Lund, Sweden

The Impostor Profile scale (IPP30) is a recently developed tool designed to delve into the nuanced aspects of the Impostor Phenomenon (IP), a psychological phenomenon where individuals wrongly attribute their successes to external factors, discounting their own abilities and often feeling like frauds. This study aimed to assess the psychometric properties, including factor structure, internal consistency, and nomological validity, of the Swedish version of IPP30 (S-IPP30). In a sample of Swedish students ($N=1,010$; 76.7% women; $M_{age}=25.65$, $SD_{age}=6.43$), Exploratory and Confirmatory Factor Analyses were conducted to scrutinize S-IPP30's structure. The analyses supported a bifactor model with six specific factors and one overarching factor. However, two items in the scale displayed poor alignment with their intended subscales, adversely affecting the internal consistency of the two subscales. Consequently, a rephrasing of these items was suggested. The remaining four S-IPP30 subscales exhibited good internal consistency (Cronbach's $\alpha=0.76-0.90$, McDonald's $\omega=0.77-0.91$). Convergent validity was confirmed by largely replicating correlations among various S-IPP30 facets, the unidimensional IP measure, personality variables, and self-esteem, thereby accomplishing the goal of validating S-IPP30. This proposed modification of the two items requires further validation using a new sample to ensure its appropriateness and effectiveness in measuring the intended constructs.

KEYWORDS

impostor phenomenon, Swedish version of the Impostor Profile scale, IPP30, validation study, exploratory factor analysis, confirmatory factor analysis

1 Introduction

"No matter what we have done, there comes a point where you think, 'How did I get here?' When are they going to discover that I am, in fact, a fraud and take everything away from me?" shares Tom Hanks in an interview (Gross, 2016). In spite of winning two academy awards and having starred in over 70 films and TV shows, he shares that he too, like many others, often struggles with low confidence and a feeling of alienation.

The Impostor Phenomenon (IP), commonly observed in ambitious individuals, refers to the phenomenon where individuals wrongly attribute their accomplishments to external factors like luck, disregarding their own capabilities (Clance and Imes, 1978). This mindset persists independently from their actual success (e.g., Brauer and Proyer, 2022). Additionally, they consistently express a fear of being exposed as frauds (Clance and Imes, 1978; Bravata et al., 2020; Chrousos et al., 2020). Although the IP was initially described in relation to high-achieving women (Clance and Imes, 1978), a meta-analysis conducted by Bravata et al. (2020)

revealed that the extent to which the IP is reported varies widely, regardless of achievements, gender, ethnicity, or racial background.

Since its inception, various scales have been developed and utilized to measure the IP. These scales, which are mentioned below, have been developed based on a specific conceptualization of the IP by its creators, thereby emphasizing particular aspects of the phenomenon. However, their main limitation lies in their unidimensional scoring method, as they fall short of capturing the unique aspects of the multidimensional characteristics associated with the IP (Brauer and Wolf, 2016; Mak et al., 2019; Ibrahim et al., 2021, 2022a; Walker and Saklofske, 2023). This limitation leads to diverse interpretations of the IP, as understanding the different aspects of the IP is primarily confined to total scores, rather than considering the entire profile with its multiple facets, as experienced by different individuals. To overcome this limitation, Ibrahim et al. (2021, 2022a) introduced a new multidimensional scale, known as the Impostor-Profile 30 (IPP30). This scale provides a more comprehensive understanding of how individuals experience various facets of the IP, allowing for a more nuanced assessment.

The aim of this study is to assess the psychometric properties of the Swedish version of the IPP30 (hereafter referred to as S-IPP30). Currently accessible only in German and English (Ibrahim et al., 2022a,b), translating it into other languages would serve a broader audience. Moreover, given the absence of a validated and publicly accessible scale in Swedish for measuring IP, validating the scale in this language holds significant scientific importance. This validation process includes confirming and contrasting the S-IPP30's factor structure, as examined by Ibrahim et al. (2021, 2022a,b), and evaluating its other psychometric properties (such as internal consistency, and nomological validity) within a large sample of Swedish students.

1.1 Measuring IP

To effectively assess and analyze the IP and develop interventions to address it, a comprehensive measurement tool is essential. Over time, five scales have been developed and utilized to measure the IP: The Harvey Impostor Phenomenon Scale (Harvey, 1981), the Clance Impostor Phenomenon Scale (CIPS) (Clance, 1985), the Perceived Fraudulence Scale (Kolligian and Sternberg, 1991), the Impostorism Scale (Leary et al., 2000), and the recently introduced Impostor Phenomenon Assessment (Walker and Saklofske, 2023). High reliability and validity are observed across all these scales (Chrisman et al., 1995; French et al., 2008; Mak et al., 2019; Walker and Saklofske, 2023), with the exception of the Harvey Impostor Phenomenon Scale (Chrisman et al., 1995). Furthermore, the initial development of the four older scales was rooted in a unidimensional framework based on specific conceptualizations of IP by their creators. However, subsequent analyses by other researchers, such as Chrisman et al. (1995), Brauer and Wolf (2016), and Brauer and Proyer (2023) demonstrated that, for instance, a 3-factor solution provided the best model fit for the CIPS in both English and German versions. Nevertheless, the number of factors varied across different studies, with a 2-factor model identified as the most fitting by French et al. (2008) and Fujie (2010), while others, including Jöstl et al. (2012) and Simon and Choi (2018), argued for a unidimensional factor structure as the most appropriate. Despite the proposed multifaceted nature of the CIPS, it is frequently interpreted as unidimensional due to the

prevalent use of total scores. This practice limits insights into the diverse facets of IP experienced by individuals (Mak et al., 2019). Consequently, varying interpretations of IP may emerge, as the understanding of its aspects is confined to total scores alone, neglecting the comprehensive profile encompassing multiple facets of the IP experienced by individuals.

In response to these limitations, Ibrahim et al. (2021, 2022a) developed the IPP30, a multidimensional self-report questionnaire from its inception. The IPP30 questionnaire was constructed based on theories and definitions of the IP proposed by Clance and Imes (1978), Harvey and Katz (1985), and Sakulku and Alexander (2011). Unlike the previously mentioned scales, the IPP30 provides not only a total score but also six subscale scores. The first subscale, *Competence doubt*, assesses self-doubt, fear of failure, and maladaptive perfectionism related to competence, particularly before engaging in a performance task. The second subscale, *Working style*, indicates tendencies toward procrastination (high scores) or precrastination (low scores), both of which are reflective of the Impostor Cycle described by Sakulku and Alexander (2011). The subscale *Alienation* evaluates feelings of inauthenticity and a propensity for impression management. *Other-self divergence*, the fourth subscale, examines the strain caused by meeting external expectations, with high scores indicating significant discrepancies between self-image and perceived external image. The fifth subscale, *Ambition*, measures the need for success and high self-expectations. Finally, the sixth subscale, *Need for sympathy*, measures agreeableness, conflict-avoidance tendencies, and reliance on others' cooperation (Ibrahim et al., 2021, 2022a).

More recently, another multidimensional scale, the Impostor Phenomenon Assessment (IPA) (Walker and Saklofske, 2023), has been introduced. This scale offers a 54-item self-assessment with three subscale scores and a total score. While a statistical comparison between the two multidimensional scales has not been conducted yet, Walker and Saklofske (2023) noted some differences, with a key distinction being that the IPP30 may allow differentiation between individuals experiencing impostor feelings and those intentionally feigning their personality or achievements, as indicated by the *Alienation* subscale. Additionally, the IPP30 may be more economical, requiring fewer items than the IPA. These differences, coupled with other limitations, emphasize the critical need to carefully choose a measurement tool that aligns with the nuanced aspects and dimensions one aims to capture when assessing IP.

The IPP30 scale demonstrated a consistent six-factor structure in both its German (Ibrahim et al., 2021, 2022a) and English (Ibrahim et al., 2022b) versions. The internal consistency of the six IPP30 subscale scores was generally deemed acceptable to high, with *Competence doubt* exhibiting the highest internal consistency ($\omega = 0.92$ and 0.93 in both the German and English versions, respectively). However, it is important to highlight that *Ambition* and the *Need for sympathy* demonstrated relatively low internal consistency in both versions of the scale, with values of $0.67/0.66$ for *Ambition* and $0.67/0.57$ for *Need for sympathy* in the German/English versions, respectively.

When examining the relationship between the subscale scores and gender, it was observed that the correlations were generally low. In the German sample (Ibrahim et al., 2022a), these correlations ranged from 0.14 for *Ambition* to 0.22 for *Competence doubt*, suggesting a slightly elevated level of IP among women. On the other hand, in the English sample (Ibrahim et al., 2022b), no significant correlation with gender was found ($r = -0.10$, $p > 0.05$).

The scale demonstrated overall good nomological validity. In the two German samples, all subscale scores, except for *Ambition* and *Need for sympathy*, consistently showed at least moderate positive correlations with the CIPS. The correlations ranged from 0.17 for *Ambition* to 0.82 for *Competence doubt*, as reported by Ibrahim et al. (2021). Moreover, anticipated associations were also observed with other indicators, including personality traits such as Neuroticism (with the strongest relationship found for *Competence doubt*, $r=0.68$, $p<0.001$), Conscientiousness (with the strongest relationship found for *Working style*, $r=0.71$, $p<0.001$), Extraversion (with the strongest relationship found for *Alienation*, $r=-0.49$, $p<0.001$), and self-esteem (with the strongest relationship found for *Competence doubt*, $r=-0.74$, $p<0.001$).

1.2 Present study

In the current study, we aim to investigate the psychometric properties of the Swedish version of the IPP30 in a student population. Specifically, we will examine its factor structure, internal consistency, and nomological validity. Expanding upon the research by Ibrahim et al. (2021, 2022a,b), we expect that the S-IPP30 will manifest a bifactor model with six specific factors and one overarching factor.

As part of the validation process, we also aim to establish the convergent and discriminant validity of the S-IPP30 by assessing its correlations with various measures. Firstly, we will explore the associations between the S-IPP30 subscales and the CIPS (Clance, 1985), a widely recognized instrument for assessing the IP. Consistent with earlier studies conducted by Ibrahim et al. (2021), our hypotheses posit that the S-IPP30 subscales will show positive correlations with the CIPS.

Furthermore, we will investigate the correlations between the S-IPP30 subscales and the Big Five personality traits, along with self-esteem, as these factors have been identified as relevant to the understanding of the IP based on prior research (Clance and Imes, 1978; Leary et al., 2000; Vergauwe et al., 2015; Bravata et al., 2020; Ibrahim et al., 2022a).

IP is strongly linked to depression, shame, and anxiety (Bravata et al., 2020), all stemming from the persistent fear of exposure as a fraud. Earlier studies also suggest a positive correlation between the IP and Neuroticism (Vergauwe et al., 2015; Ibrahim et al., 2022a), indicating a higher likelihood of experiencing the IP among individuals with elevated Neuroticism scores. Consequently, we anticipate positive correlations between Neuroticism and the S-IPP30 subscales.

Conscientiousness, characterized by qualities such as ambition, thoughtfulness, and competence, was found to exhibit negative correlations with the German version of the IPP30 subscales (Ibrahim et al., 2022a). This suggests that individuals experiencing high levels of impostor phenomenon seem to lack feelings of competence (Vergauwe et al., 2015). Thus, in line with the research, we anticipate negative correlations between Conscientiousness and the S-IPP30 subscales. Moreover, existing literature suggests a negative relationship between Extraversion and the IP. This is likely due to the IP being associated with negative affect (Leary et al., 2000), while individuals scoring high on Extraversion typically experience feelings of cheerfulness and optimism (Vergauwe et al., 2015). Building on prior research and findings by Ibrahim et al. (2022a), we anticipate finding negative relationships between Extraversion and the S-IPP30

subscales. Individuals high in Extraversion, characterized by sociability and positive affect, are less likely to experience the negative feelings associated with impostor phenomenon, such as doubts about their competence and feelings of alienation.

In line with findings in previous research demonstrating an inverse association between self-esteem and feelings of impostorism (Clance and Imes, 1978; Bravata et al., 2020), and considering the negative correlations found between the German version of the IPP30 subscales and self-esteem by Ibrahim et al. (2022a), we anticipate a negative relationship between self-esteem and the S-IPP30 subscales as well.

Lastly, in alignment with previous research conducted in both German and English samples (Ibrahim et al., 2022a,b), we expect a weak correlation between gender and the S-IPP30 subscales.

2 Materials and methods

2.1 Participants

A total of 1,022 students enrolled at Lund University at the Bachelor's level and upwards responded to the survey sent to their student email addresses. Using the Mahalanobis Distance, 12 outliers with significant distances at the $p<0.001$ level were identified and excluded. In the end, the final sample consisted of 1,010 participants ($M=25.65$ years, $SD=6.43$). Participants were randomly divided into two subsamples for the Exploratory and Confirmatory Factor Analyses, respectively. Subsample 1 consisted of 505 participants ($M=25.81$ years, $SD=6.83$) and Subsample 2 consisted of 505 participants as well ($M=25.48$ years, $SD=6.04$). Table 1 highlights the sample characteristics in detail.

2.2 Measures

2.2.1 The impostor profile scale

The impostor profile scale (Ibrahim et al., 2021) consists of 30 items, organized into six subscales: *Competence doubt* (11 items; e.g., “Despite past successes, I have a strong fear of failure”), *Working style* (6 items; e.g.,

TABLE 1 Sample characteristics.

Variable	Overall ($n = 1,010$)	Subsample 1 ($n = 505$)	Subsample 2 ($n = 505$)
Gender			
Female	775 (76.7%)	402 (79.6%)	373 (73.9%)
Male	219 (21.7%)	97 (19.2%)	122 (24.2%)
Other	16 (1.6%)	6 (1.2%)	10 (2.0%)
Nationality			
Swedish-born	943 (93.4%)	471 (93.3%)	472 (93.5%)
Other	67 (6.6%)	34 (6.7%)	33 (6.5%)
Education			
Bachelor's studies	634 (62.8%)	325 (64.4%)	309 (61.2%)
Master's studies	285 (28.2%)	141 (27.9%)	144 (28.5%)
Other	91 (9.0%)	39 (7.7%)	52 (10.3%)

“I tend to complicate things by procrastinating”), *Alienation* (3 items; e.g., “I rarely show my true self”), *Other-self divergence* (4 items; e.g., “People tend to overestimate my abilities”), *Ambition* (3 items; e.g., “Creating something significant is very important to me”), and *Need for sympathy* (3 items; e.g., “Being liked by others is important to me”). Responses are recorded using a visual analog scale ranging from 0 (“does not apply in any aspect”) to 100 (“applies completely”).

In previous studies conducted by Ibrahim et al. (2021, 2022a,b), acceptable to good internal consistency was noted for five out of the six subscales, with Cronbach's α /McDonald's ω values ranging from 0.66/0.71 to 0.92/0.91. However, the Need for sympathy subscale exhibited a lower level of reliability ($\alpha=0.67$, $\omega=0.50$). The internal consistency of the S-IPP30 for this study is reported in the Results section.

2.2.2 The Clance impostor phenomenon scale

The Clance impostor phenomenon scale (Clance and Otoole, 1988) is the first scale created to measure IP and is still most frequently used to measure the phenomenon (Mak et al., 2019). It contains 20 items and uses a 5-point Likert scale ranging from 1 (“not at all true”) to 5 (“very true”). A systematic review performed by Mak et al. (2019) found the CIPS to have a good internal consistency, with Cronbach alpha values ranging from $\alpha=0.85$ – 0.96 . In the study, the CIPS showed an excellent internal consistency with $\alpha=0.92$.

2.2.3 The Big Five inventory

The Big Five inventory (John and Srivastava, 1999) is a 44-item self-report personality inventory based on the Big five dimensions of personality measuring Agreeableness, Extraversion, Conscientiousness, Openness to Experience, and Neuroticism. The scale uses a 5-point Likert response ranging from 1 (“strongly disagree”) to 5 (“strongly agree”). The English BFI has previously reported good internal consistencies ($\alpha=0.79$ – 0.88) (John and Srivastava, 1999). The Swedish BFI also reflects good internal consistency ($\alpha=0.73$ – 0.84) (Zakrisson, 2010). In the study, the BFI showed good internal consistency ($\alpha=0.71$ – 0.81).

2.2.4 The Rosenberg self-esteem scale

The Rosenberg self-esteem scale (Rosenberg, 1965) is a 10-item questionnaire comprising an equal number of positively and negatively worded statements. Respondents provide their answers on a 4-point Likert scale, ranging from 1 (“strongly agree”) to 4 (“strongly disagree”). The RSES demonstrates robust reliability with a Cronbach's α coefficient of 0.91 (Eklund et al., 2018). In the study, the internal consistency for the RSES was also found to be $\alpha=0.91$.

2.3 Procedure

An email with an anonymous link to the survey through Sunet Survey, a survey tool that is procured by Lund University and intended for similar purposes, was sent to the students at Lund University, Sweden. The data traffic between the participant and the server is encrypted. The system complies with the GDPR and personal data assistant agreements exist. The students received detailed information about the study, emphasizing the confidentiality and anonymity of their responses. Prior to participating, all participants provided informed consent by checking a box on an online form, indicating

their understanding of the study's purpose and their agreement to participate.

The original IPP30 was developed in German by Ibrahim et al. (2022a). An English translation provided by the authors was translated and back-translated to Swedish. Two native Swedish and English speakers were involved in this translation process. Any discrepancies between the English translation provided by the authors and the back-translated version were discussed. Item 22 “I often behave little authentic” in the IPP30 (English), was unclear to the translators. The developers of the scale were contacted for clarification. The Swedish version of the IPP30 can be found in Supplementary Table S1.

2.4 Ethical statement

All participants in the study were given informed consent, ensuring that they were fully aware of the voluntary nature of their participation, their right to withdraw from the study at any time, and the assurance of data confidentiality. The process of obtaining informed consent adhered to the principles outlined in the Declaration of Helsinki. The study protocol received approval from the ethical committee at the Department of Psychology, Lund University. To maintain anonymity, participants were instructed to create a unique code that could be used to withdraw their data from the dataset after the study was completed. At the conclusion of the study, participants were provided with a debriefing form. This document contained detailed information about the study, its purpose, and the contact details of the researchers. The debriefing process ensured that participants were well-informed about the study and had the opportunity to seek additional information or clarify any concerns they may have had. By implementing these ethical practices, the study prioritized participant autonomy, confidentiality, and well-being in line with established guidelines and regulations.

2.5 Statistical analyses

Statistical analyses including model testing, descriptive analyses and correlations were performed using the R software (R Core Team, 2020) with packages “lavaan” (Rosseel, 2012), “psych” (Revelle, 2022), and “jmv” (Selker et al., 2022).

The data were first checked for outliers. Using the Mahalanobis Distance, 12 outliers with significant distances at the $p<0.001$ level were identified and excluded. Descriptive statistics were then performed on the final data ($N=1,010$) to evaluate the sample characteristics and perform other statistical analyses. We conducted an Exploratory Factor Analysis (EFA) using Principal-axis extraction with Promax-rotation and the Parallel Factor method in the R-package “jmv” (Selker et al., 2022) to find a factor solution for the S-IPP30 with item loadings >0.30 on specific factors. The following fit indices for a good/satisfying model fit were used: Comparative Fit Index (CFI) $>0.95/0.90$, Tucker-Lewis Index (TLI) $>0.95/0.90$, the Root Mean Square Error of Approximation (RMSEA) $<0.06/0.08$, the Standardized Root Mean Square of Approximation (SRMR) $<0.08/0.10$, the Akaike Information Criterion (AIC), and the Bayesian Information Criterion (BIC), where lower values indicate better fit (Hu and Bentler, 1999). In the second step, a Confirmatory Factor Analysis (CFA) using Robust Maximum-Likelihood Estimation

in the R-package “lavaan” (Rosseel, 2012) to replicate the structure as found in step 1 (i.e., Exploratory Factor Analysis) and also by Ibrahim et al. (2021, 2022a). The same model fit indices as described for the EFA were used. To assess measurement invariance across genders, we compared more restrictive models to a less constrained model, focusing on changes in CFI (Δ CFI) and RMSEA (Δ RMSEA). Consistent with previous research (Chen, 2007; Sass, 2016), we considered Δ CFI ≤ 0.010 and Δ RMSEA ≤ 0.015 as indicators of the invariance assumption being met.

The internal consistency was estimated with the use of Cronbach's α and McDonald's ω levels, with a criterion value of >0.70 for acceptable consistency (DeVellis, 2003). Pearson correlations were used to evaluate the nomological validity by investigating the correlations between the S-IPP30 subscales and the other instruments described in the previous section.

3 Results

3.1 Exploratory factor analysis

Using the R-package “jmv” (Selker et al., 2022), exploratory factor analysis was performed on Subsample 1 ($n_1 = 505$, excellent sampling adequacy, KMO = 0.89). Promax-rotation was used in combination with principal-axis factoring extraction and those items with a main factor loading smaller than 0.30 were hidden. Following the recommended use of parallel analysis (Braeken and van Assen, 2017; Holubova, 2023), a 7-factor model was derived with good fit (RMSEA = 0.04, 90% CI [0.03–0.04], TLI = 0.95, BIC = 1109.427, $\chi^2_{(246)} = 421.81$, $p < 0.001$). Each factor consists of 3–11 items; absolute factor correlations ranged from 0.02 to 0.53.

As a consequence of the low inter-factor correlation between Factor 7 and Factor 6 (0.02) and the fact that Factor 7 consisted of only one item (item 15, factor loading 0.63), an EFA with a fixed factor method was used to determine the fit of a 6-factor model. The 6-factor model fit was also good (RMSEA = 0.04, 90% CI [0.04–0.05], TLI = 0.94, BIC = 1161.499, $\chi^2_{(270)} = 519.13$, $p < 0.001$). The factor loadings for the 6-factor model can be found in Table 2, where Item 15 and Item 16 have factor loadings of less than 0.3. The results were similar to those found by Ibrahim et al. (2021). Item 16 (“I am considered a very helpful person”) loaded on the same factor Ibrahim et al. (2021) found, whereas Item 15 (“A job in which I had many subordinates would satisfy me.”) loaded on Factor 1.

3.2 Confirmatory factor analysis

A confirmatory factor analysis was conducted using Robust maximum-likelihood estimation. The R-package “lavaan” was used to perform calculations (Rosseel, 2012). Using the second subsample ($n_2 = 505$) four models were evaluated and compared based on fit indices (see Table 3). The single-factor model demonstrated inadequate goodness of fit (CFI = 0.42; TLI = 0.38; RMSEA = 0.14; SRMR = 0.13). Conversely, the six-factor model (CFI = 0.91; TLI = 0.90; RMSEA = 0.06; SRMR = 0.06) exhibited acceptable fit across all indices, akin to the second-order factor model (CFI = 0.90; TLI = 0.90; RMSEA = 0.06; SRMR = 0.07). However, the bifactor model with six group factors and a general factor demonstrated superior fit

(CFI = 0.93; TLI = 0.92; RMSEA = 0.05; SRMR = 0.05) and marginally outperformed both the six-factor model (Δ CFI = 0.02, Δ TLI = 0.02, Δ RMSEA = 0.01, Δ AIC = −155.7) and the second-order model in terms of goodness of fit (Δ CFI = 0.03, Δ TLI = 0.02, Δ RMSEA = 0.01, Δ AIC = −184.1).

Notably, items 15 and 16 exhibited weak loadings even in the CFA, with standardized loadings of 0.11 and 0.23, respectively, though both were significant at the 0.001 level. All other items demonstrated loadings exceeding 0.40 on their respective factors and were statistically significant at $p < 0.001$ (Figure 1). Additionally, scalar invariance was confirmed for gender, as evidenced in Table 4, indicating directly comparable mean values across genders.

3.3 Internal consistency

The Cronbach's alpha and McDonald's omega coefficients for the six subscales demonstrated varying levels of internal consistency, ranging from $\alpha = 0.53$ to 0.90 and $\omega = 0.64$ –0.91. As illustrated in Table 5, *Ambition* and *Need for sympathy*, each consisting of only three items and incorporating items 15 and 16—items that exhibited low loadings in both the earlier EFA and CFA—showed the lowest internal consistency values. Upon excluding these items, the internal consistency improved to satisfactory levels, yielding α/ω values of 0.72/0.73 and 0.74/0.74 for *Ambition* and *Need for sympathy*, respectively. A detailed overview of the internal consistency statistics is provided in Table 5.

3.4 Nomological validity

The complete sample of 1,010 participants was utilized to assess the nomological validity of the S-IPP30 by examining the relationships between S-IPP30 subscale scores and the CIPS, the Big Five personality factors, as well as self-esteem.

Initially, we explored the intercorrelations among the S-IPP30 subscales. As displayed in Table 6, *Competence doubt* exhibited the strongest positive associations with the other S-IPP30 subscales, while the lowest intercorrelations were observed between *Ambition* and the remaining subscales.

Table 7 provides a concise overview of the correlations between S-IPP30 subscales and the other variables examined in the study. As expected, positive associations were found between CIPS and the S-IPP30 subscales, though their strength varied. Notably, the correlation with *Ambition* was the weakest ($r = 0.08$, $p < 0.05$), followed by the correlations with *Working style* ($r = 0.22$, $p < 0.001$) and *Need for sympathy* ($r = 0.24$, $p < 0.001$). In contrast, the most significant correlation was observed with *Competence doubt* ($r = 0.82$, $p < 0.001$).

In the realm of personality traits, significant positive associations were observed between Neuroticism and all S-IPP30 subscales, except for *Ambition*. These associations exhibited varying strengths, ranging from $r = 0.19$, $p < 0.001$, for Neuroticism and *Need for sympathy* to a robust $r = 0.67$, $p < 0.001$, for Neuroticism and *Competence doubt*. Notably, Neuroticism displayed a very weak correlation ($r < 0.01$) with *Ambition*, suggesting a lack of substantial relationship between these traits in the study's context.

Furthermore, Conscientiousness demonstrated strong and negative correlation with *Working style* ($r = -0.66$, $p < 0.001$), while

TABLE 2 Exploratory factor loadings of the S-IPP30.

Item	Competence doubt	Working style	Alienation	Other-self divergence	Ambition	Need for sympathy
1	0.83					
10	0.71					
4	0.71					
23	0.68					
13	0.67					
5	0.65					
26	0.61					
30	0.58					
14	−0.54					
18	0.40					
21	0.30					
2		0.91				
17		0.89				
6		0.88				
11		−0.80				
24		0.74				
29		−0.51				
28			0.93			
25			0.86			
22			0.68			
20				0.87		
3				0.73		
27				0.69		
7				0.34		
8					0.77	
19					0.67	
15						
12						0.91
9						0.68
16						

N = 505. Bold, reverse item. Only factor loadings ≥ 0.30 are presented in the table.

TABLE 3 Goodness-of-fit indices for model comparison.

Model	χ^2	df	CFI	TLI	RMSEA (90%)	SRMR	AIC	BIC
1-factor model	4304.4	405	0.42	0.38	0.14 (0.13–0.14)	0.13	142,387.1	142,767.3
6-factor model	998.7	390	0.91	0.90	0.06 (0.05–0.06)	0.06	139,111.4	139,555.0
Second-order model	1045.1	399	0.90	0.90	0.06 (0.05–0.06)	0.07	139,139.8	139,545.4
Bifactor model	813.0	375	0.93	0.92	0.05(0.04–0.05)	0.05	138,955.7	139,462.8

N = 505. CFI, comparative fit index; RMSEA, root mean square error of approximation; SRMR, standardized root mean residual.

Extraversion exhibited moderate and negative relationships with *Alienation* ($r = -0.33$, $p < 0.001$) and *Competence doubt* ($r = -0.25$, $p < 0.001$). Conversely, correlations with *Other-self divergence* were low ($r = -0.19$, $p < 0.001$), similar to those found with *Ambition* ($r = -0.20$, $p < 0.001$).

For the remaining two traits, Openness to experience and Agreeableness, no specific hypotheses were posited. Correlations with Openness were generally low, while *Need for sympathy* demonstrated a moderate correlation with Agreeableness ($r = -0.19$, $p < 0.001$).

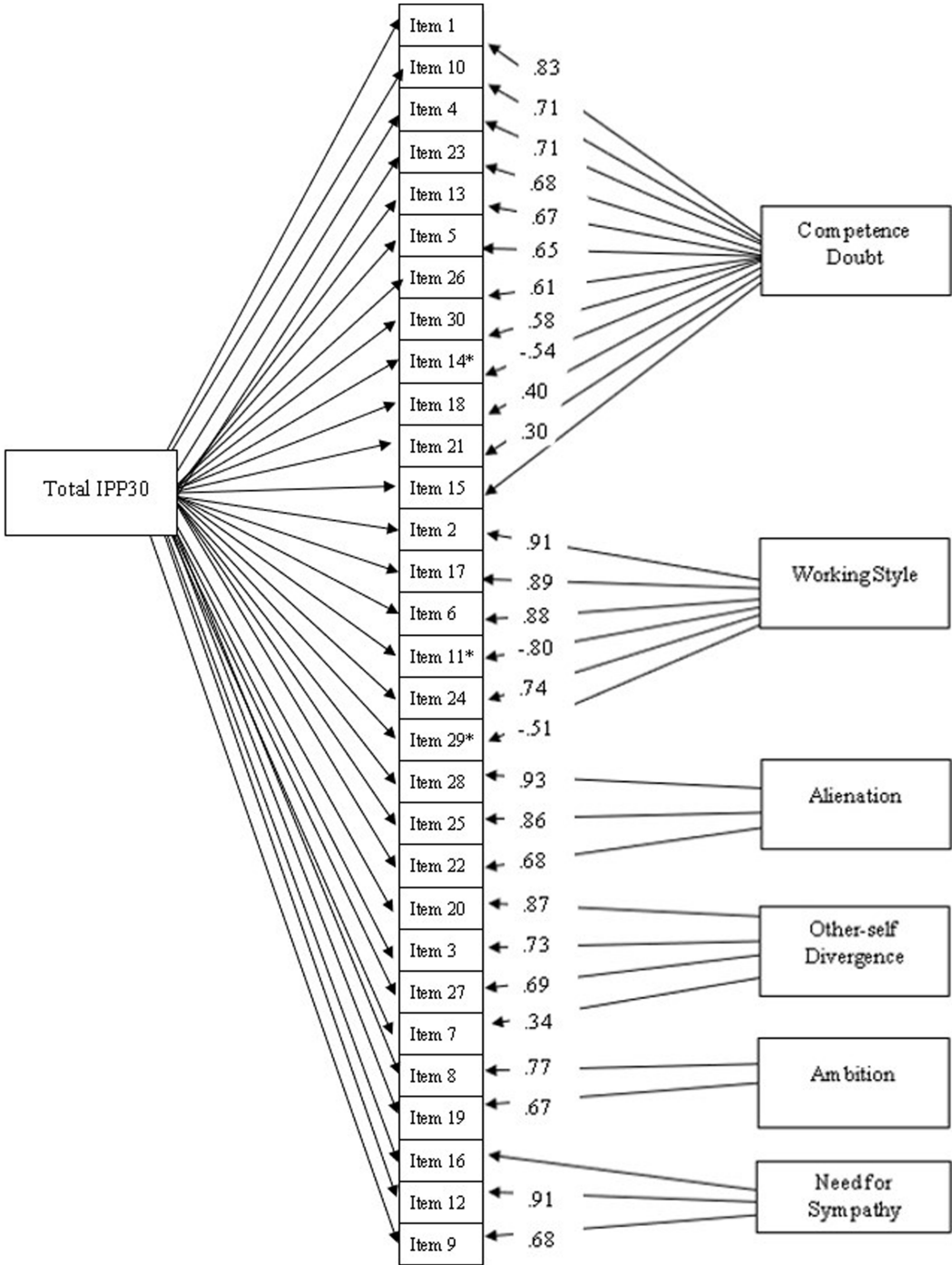


FIGURE 1
Factor loadings of the S-IPP30 items obtained from confirmatory factor analysis.

TABLE 4 Comparing configural, metric and scalar invariance across gender groups.

Invariance	χ^2	df	p	CFI	RMSEA	$ \Delta $	$\Delta\chi^2$	p for $\Delta\chi^2$	Δ CFI	Δ RMSEA
1. Configural	1251.01	670	<0.001	0.908	0.059					
2. Metric	1282.81	692	<0.001	0.907	0.059	$ \Delta $ 2–1	31.79	0.081	0.001	0.000
3. Scalar	1313.44	714	<0.001	0.906	0.058	$ \Delta $ 3–2	30.63	0.104	0.001	0.001

CFI, comparative fit index; RMSEA, root mean square error of approximation.

TABLE 5 Reliability scores of the S-IPP30.

Scale/ Item	<i>r</i> ^a	α ^b	90% CI	<i>M</i> (<i>SD</i>)	ω ^c
Competence doubt		0.89	0.87–0.90	60 (20)	0.89
1	0.73	0.87		70 (27)	
4	0.72	0.87		68 (28)	
5	0.55	0.88		59 (32)	
10	0.73	0.87		54 (32)	
13	0.69	0.88		63 (30)	
14*	0.52	0.88		65 (28)	
18	0.52	0.88		53 (30)	
21	0.44	0.88		48 (33)	
23	0.62	0.88		67 (29)	
26	0.58	0.88		48 (34)	
30	0.61	0.88		68 (30)	
Working style		0.90	0.89–0.91	54(27)	0.91
2	0.84	0.87		55 (34)	
6	0.84	0.87		50 (34)	
11*	0.70	0.89		60 (33)	
17	0.81	0.88		53 (34)	
24	0.71	0.89		64 (31)	
29*	0.52	0.92		46 (28)	
Alienation		0.87	0.86–0.90	33(27)	0.87
22	0.69	0.86		31 (29)	
25	0.75	0.81		40 (32)	
28	0.80	0.76		29 (28)	
Other-self divergence		0.76	0.73–0.80	40 (22)	0.77
3	0.62	0.67		38 (26)	
7	0.38	0.80		38 (28)	
20	0.68	0.64		41 (29)	
27	0.58	0.69		44 (30)	
Ambition		0.53	0.45–0.60	54 (20)	0.64
8	0.43	0.21		74 (25)	
15	0.11	0.72		56 (30)	
19	0.45	0.13		33 (28)	
Need for sympathy		0.59	0.52–0.65	76 (17)	0.68
9	0.55	0.24		80 (23)	
12	0.49	0.34		76 (24)	
16	0.19	0.74		72 (20)	
Total score		0.88	0.85–0.89	55 (14)	0.88

N = 1,010. *Reverse scored items. ^aPearson's *r* indicating the correlation between the item and the scale. ^bCronbach's alpha; total values for subscales (bold); corrected subscale values when the item is dropped for each. ^cTotal omega. σ^2 percentage of variance.

4 Discussion

The results of the study conducted on the S-IPP30 scale largely replicated the bifactor model with six specific factors and one overarching factor, as reported in previous studies by Ibrahim et al.

(2021, 2022a). However, it was observed that items 15 and 16 had low factor loadings in both exploratory and confirmatory factor analyses in the present study. These items also reduced the internal consistency of the *Ambition* and *Need for sympathy* subscales. One possible explanation for this finding is that the instrument in the present study was administered to a student population. Item 15 specifically inquired about feelings of job satisfaction with subordinates, which may not be relatable to most students who have limited experience in such positions. This discrepancy between our study and Ibrahim et al. (2021, 2022a) study, which included a working population, could be attributed to this reason. Furthermore, the other items measuring *Ambition* seem to assess different aspirations compared to Item 15. For example, “For me, it is very important to create something significant” and “Achieving something significant is what matters most to me in life” capture different aspects of *Ambition*. To address these issues and enhance the scale's applicability to student populations, we propose a revision of item 15. A rephrased version could be: “I would be comfortable with leading a group of people to achieve a significant or important goal.” This revised statement aims to align more closely with the underlying construct of *Ambition*, ensuring its relevance to leadership positions focused on achieving goals and leading others.

The low factor loading on Item 16 may be attributed to its phrasing: “I am considered a helpful person.” In contrast to the other items in the same subscale measuring the *Need for sympathy*, which inquire about aspiring to possess specific values and behaviors, such as appearing sympathetic and being liked, Item 16 necessitates self-reflection. The *Need for sympathy* factor specifically refers to a need for popularity and an overreliance on the goodwill of others (Ibrahim et al., 2022a). As Item 16 does not measure the subscale in the same way as the other two items, we propose rephrasing it. For instance, a better measurement of the construct could be achieved with a revised item such as “It is important to be considered a helpful person.” It is imperative to validate this proposed revision of the two items using a new sample to ensure their appropriateness and effectiveness in measuring the intended constructs.

Another aspect that warrants further discussion regarding the IPP30 is the imbalance in the number of items across the subscales. The *Competence doubt* subscale consists of 11 items, while other subscales such as *Alienation*, *Ambition*, and *Need for sympathy* contain only 3 items. Given that the construct of *Competence doubt* aligns closely with the original IP definition (Bravata et al., 2020) and its underlying elements, as supported by the analyses, it is reasonable for this subscale to have the highest number of items. However, shortening this subscale would help prevent participant fatigue and achieve a more balanced measurement. Therefore, we suggest a critical evaluation of the items with the lowest factor loadings in this subscale and a reconsideration of which items should be included. Furthermore, the subscales with fewer items explained significantly less variance compared to those with more items. To address this issue, it might be beneficial to consider adding more items to these subscales in order to increase the variance explained by them.

Regarding the nomological validity of the S-IPP30, our findings align closely with both our hypotheses and prior research (Ibrahim et al., 2021, 2022a). Positive correlations were observed between the S-IPP30 subscales and the CIPS, a well-established measurement for the IP, indicating that the subscales adequately capture the IP

TABLE 6 Inter-correlations between the S-IPP30 subscales.

Variable	2	3	4	5	6	7
1 Competence doubt	0.22***	0.39***	0.47***	0.11***	0.31***	0.86***
2 Working style	–	0.16***	0.17***	–0.08*	0.02	0.58***
3 Alienation		–	0.34***	0.01	0.05	0.54***
4 Other-self divergence			–	0.05	0.09**	0.62***
5 Ambition				–	0.19***	0.15***
6 Need for sympathy					–	0.35***
7 S-IPP30 total						–

N = 1,010. * $p < 0.05$ (two-tailed). ** $p < 0.01$ (two-tailed). *** $p < 0.001$ (two-tailed).

TABLE 7 Correlations between S-IPP30 subscales and other studied variables.

Variable	Competence doubt	Working style	Alienation	Other-self divergence	Ambition	Need for sympathy	IPP30 total
CIPS total	0.82***	0.22***	0.39***	0.53***	0.08*	0.24***	0.77***
BFI subscales							
Neuroticism	0.67***	0.21***	0.34***	0.24***	< 0.01	0.19***	0.59***
Conscientiousness	–0.18***	–0.66***	–0.23***	–0.21***	0.14***	0.08**	–0.42***
Extraversion	–0.25***	–0.12***	–0.33***	–0.19***	0.20***	0.14***	–0.25***
Agreeableness	–0.08**	–0.11***	–0.27***	–0.15***	0.03	0.44***	–0.12***
Openness to experience	–0.07**	0.08*	–0.05	–0.12***	0.21***	0.03	–0.02
RSES total	–0.70***	–0.28***	–0.44***	–0.40***	–0.02	–0.11***	–0.68***
Gender	0.29***	–0.06*	–0.00	–0.02	0.12***	0.24***	0.15***

N = 1,010. CIPS, The Clance Impostor Phenomenon Scale; BFI, Big Five Inventory; RSES, Rosenberg Self-Esteem Scale. Gender: 1 = woman, 0 = man. * $p < 0.05$ (two-tailed). ** $p < 0.01$ (two-tailed). *** $p < 0.001$ (two-tailed).

construct. Furthermore, negative correlations were found between the subscales and Conscientiousness and Extraversion, while positive correlations were found with Neuroticism, providing further evidence for the good nomological validity of the scale. Interestingly, both the *Ambition* and *Need for sympathy* subscales showed positive correlations with Conscientiousness and Extraversion. The positive correlation between *Ambition* and Conscientiousness can be attributed to the fact that ambition is a core element of the Conscientiousness trait. Therefore, the positive association is not surprising. The positive correlation between Conscientiousness and *Need for sympathy* may be due to the shared association with thoughtfulness, as indicated in previous studies (Hoekstra et al., 2007). Additionally, high levels of Extraversion have been found to be related to higher popularity and a larger number of friends (Feiler and Kleinbaum, 2015), which explains the positive correlation between Extraversion and the *Need for sympathy* construct. The positive correlation between Extraversion and *Ambition* is likely due to the fact that Extraversion is associated with optimism (Sharpe et al., 2011), which could predict higher scores on the *Ambition* subscale.

Furthermore, consistent with our expectations, we discovered a negative association between self-esteem and the S-IPP30 subscales, aligning with previous research emphasizing low self-esteem as a fundamental aspect of the IP experience (Clance and Imes, 1978; Bravata et al., 2020; Ibrahim et al., 2021, 2022a). Lastly, the correlations between gender and the S-IPP30 subscales were notably low and closely resembled the findings reported by Ibrahim et al. (2022a), with women reporting higher levels of competence doubt and a greater

need for sympathy, although these differences exhibited rather small effect sizes.

4.1 Strengths, limitations, and future directions

The sample size of this study contributes to the credibility and generalizability of the results within the student population. However, it is important to acknowledge that the findings may be limited to students exclusively, highlighting the need for future research to validate the S-IPP30 scale with diverse samples, including working professionals and individuals in different leadership roles. Furthermore, as mentioned earlier, a modification of two items displaying low loadings in both EFA and CFA, thereby compromising internal consistency, is warranted. Implementing this adjustment and testing the scale in more diverse samples would contribute to a more comprehensive understanding of its applicability across different populations.

Another limitation of this study is the lack of representation of individuals identifying with genders other than female or male. The existing research on the IP has predominantly focused on these two genders, and there is a dearth of information comparing the experience of the IP beyond this binary framework. Consequently, it is crucial for future studies to address this gap and explore the concept of the IP within the mentioned population. By doing so, we can gain a more comprehensive understanding of the IP and its impact across diverse gender identities.

4.2 Practical implications

The results of this study make significant contributions to the field of applied psychology by addressing the need for a measurement tool that caters to the culture, language, and population of Swedish-speaking individuals. Often, communities and populations are overlooked when it comes to measuring psychological constructs, and the IP is no exception. The lack of an available validated measurement tool for the Swedish population highlights the importance of this study's contribution.

Furthermore, this study has implications for the existing perspectives on the IP in current literature. The findings emphasize the multidimensionality of the phenomenon, suggesting that future analyses should consider measuring the IP using a multidimensional approach rather than relying solely on a unidimensional total score. This insight adds nuance and complexity to our understanding of the IP and underscores the importance of capturing its various dimensions for a more comprehensive assessment.

5 Conclusion

The study findings demonstrated that the Swedish version of the IPP30 exhibited satisfactory psychometric properties. Both the EFA and CFA provided evidence of good model fit, indicating that the scale effectively measures the intended constructs, with the exception of two subscales that contained one item each, which loaded poorly on the expected factors. Rephrasing of these items was suggested, and further investigation in future research is warranted. The internal consistency of the scale, including both the total scale and subscales, was deemed satisfactory.

Additionally, a comprehensive examination of the correlations between the S-IPP30 and the CIPS, the Big Five personality traits, and self-esteem supported the scale's good nomological validity. These correlations provided evidence for the expected relationships between the S-IPP30 subscales and external measures, strengthening the scale's construct validity.

Future research should continue to explore and refine the scale, taking into account the identified limitations and potential improvements.

Data availability statement

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

References

- Braeken, J., and van Assen, M. (2017). An empirical Kaiser criterion. *Psychol. Methods* 22, 450–466. doi: 10.1037/met0000074
- Brauer, K., and Proyer, R. T. (2022). The impostor phenomenon and causal attributions of positive feedback on intelligence tests. *Personal. Individ. Differ.* 194:111663. doi: 10.1016/j.paid.2022.111663
- Brauer, K., and Proyer, R. T. (2023). Understanding the Clance impostor phenomenon scale through the lens of a bifactor model. *Eur. J. Psychol. Assess.* doi: 10.1027/1015-5759/a000786
- Brauer, K., and Wolf, A. (2016). Validation of the German-language Clance impostor phenomenon scale (GCIPS). *Personal. Individ. Differ.* 102, 153–158. doi: 10.1016/j.paid.2016.06.071
- Bravata, D. M., Watts, S. A., Keefer, A. L., Madhusudhan, D. K., Taylor, K. T., Clark, D. M., et al. (2020). Prevalence, predictors, and treatment of impostor syndrome: a systematic review. *J. Gen. Intern. Med.* 35, 1252–1275. doi: 10.1007/S11606-019-05364-1
- Chen, F. F. (2007). Sensitivity of goodness of fit indexes to lack of measurement invariance. *Struct. Equ. Modeling* 14, 464–504. doi: 10.1080/10705510701301834
- Chrisman, S. M., Pieper, W. A., Clance, P. R., Holland, C. L., and Glickauf-Hughes, C. (1995). Validation of the Clance impostor phenomenon scale. *J. Pers. Assess.* 65, 456–467. doi: 10.1207/s15327752jpa6503_6
- Chrousos, G. P., Mentis, A. F. A., and Dardiotis, E. (2020). Focusing on the neuro-psycho-biological and evolutionary underpinnings of the impostor syndrome. *Front. Psychol.* 11:1553. doi: 10.3389/fpsyg.2020.01553

Ethics statement

The studies involving humans were approved by the Etikkommittén at the Department of Psychology, Lund 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

VD: Conceptualization, Data curation, Methodology, Formal analysis, Investigation, Validation, Writing – original draft. MA: Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Validation, Writing – original draft. DD: Conceptualization, Data curation, Methodology, Supervision, Writing – review & editing.

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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.2024.1341406/full#supplementary-material>

- Clance, P. R. (1985). *The impostor phenomenon: overcoming the fear that haunts your success*. Atlanta: Peachtree.
- Clance, P. R., and Imes, S. A. (1978). The imposter phenomenon in high achieving women: dynamics and therapeutic intervention. *Psychotherapy* 15, 241–247. doi: 10.1037/h0086006
- Clance, P. R., and Otoole, M. A. (1988). The Imposter Phenomenon: An internal barrier to empowerment and achievement. *Women Ther.* 6, 51–64. doi: 10.1300/J015V06N03_05
- DeVellis, R. F. (2003). *Scale development: Theory and applications*. California: Sage Publications.
- Eklund, M., Bäckström, M., and Hansson, L. (2018). Psychometric evaluation of the Swedish version of Rosenberg's self-esteem scale. *Nord. J. Psychiatry* 72, 318–324. doi: 10.1080/08039488.2018.1457177
- Feiler, D. C., and Kleinbaum, A. M. (2015). Popularity, similarity, and the network extraversion bias. *Psychol. Sci.* 26, 593–603. doi: 10.1177/0956797615569580
- French, B. F., Ullrich-French, S. C., and Follman, D. (2008). The psychometric properties of the Clance impostor scale. *Personal. Individ. Differ.* 44, 1270–1278. doi: 10.1016/j.paid.2007.11.023
- Fujie, R. (2010). Development of the state impostor phenomenon scale. *Jpn. Psychol. Res.* 52, 1–11. doi: 10.1111/j.1468-5884.2009.00417.x
- Gross, T. (2016) *Tom Hanks says self-doubt is 'a high-wire act that we all walk'*. NPR. Available at: <https://www.npr.org/2016/08/29/491800907/tom-hanks-says-self-doubt-is-a-high-wire-act-that-we-all-walk> (Accessed October 28, 2023).
- Harvey, J. C. (1981). *The impostor phenomenon and achievement: a failure to internalise success*. Temple University, Philadelphia, PA.
- Harvey, J. C., and Katz, C. (1985). *If I'm so successful, why do I feel like a fake? The impostor phenomenon*. New York, NY: St. Martin's Press.
- Hoekstra, H. A., Ormel, J., and De Fruyt, F. (2007). *Handleiding: NEO persoonlijkheidsvragenlijsten/Manual: NEO personality questionnaires*. Amsterdam: Hogrefe.
- Holubova, H. (2023). A comparative analysis of the principal component method and parallel analysis in working with official statistical data. *Statist. Trans.* 24, 199–212. doi: 10.59170/stattrans-2023-011
- Hu, L.-T., and Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: conventional criteria versus new alternatives. *Struct. Equ. Model.* 6, 1–55. doi: 10.1080/10705519909540118
- Ibrahim, F., Münscher, J. C., and Herzberg, P. Y. (2021). Examining the impostor-profile—is there a general impostor characteristic? *Front. Psychol.* 12:3847. doi: 10.3389/fpsyg.2021.720072
- Ibrahim, F., Münscher, J. C., and Herzberg, P. Y. (2022a). The facets of an impostor-development and validation of the impostor-profile (IPP31) for measuring impostor phenomenon. *Curr. Psychol.* 41, 3916–3927. doi: 10.1007/s12144-020-00895-x
- Ibrahim, F., Münscher, J.-C., and Herzberg, P. Y. (2022b). The validation of the English impostor-profile 30 and the exploratory formulation of the learned helplessness model of the impostor phenomenon. *Acta Psychol.* 226:103589. doi: 10.1016/j.actpsy.2022.103589
- John, O. P., and Srivastava, S. (1999). “The big five trait taxonomy: history, measurement, and theoretical perspectives” in *Handbook of personality: theory and research*. eds. L. A. Pervin and O. P. John (New York: Guilford Press), 102–138.
- Jöstl, G., Bergsmann, E., Lüftenegger, M., Schober, B., and Spiel, C. (2012). When will they blow my cover? *Z. Psychol.* 220, 109–120. doi: 10.1027/2151-2604/a000102
- Kolligian, J., and Sternberg, R. J. (1991). Perceived fraudulence in young adults: is there an 'Impostor Syndrome'? *J. Pers. Assess.* 56, 308–326. doi: 10.1207/s15327752jpa5602_10y
- Leary, M. R., Patton, K. M., and Orlando, A. E. (2000). The impostor phenomenon: self-perceptions, reflected appraisals, and interpersonal strategies. *J. Pers.* 68, 725–756. doi: 10.1111/1467-6494.00114
- Mak, K. K. L., Kleitman, S., and Abbott, M. J. (2019). Impostor phenomenon measurement scales: a systematic review. *Front. Psychol.* 10:671. doi: 10.3389/fpsyg.2019.00671/BIBTEX
- R Core Team (2020). *R: a language and environment for statistical computing*. R Foundation for Statistical Computing, Vienna. Available at: <https://www.R-project.org/>.
- Revelle, W. (2022) *Psych: procedures for personality and psychological research*, Northwestern University, Evanston, IL, version = 2.2.3. Available at: <https://CRAN.R-project.org/package=psych>
- Rosenberg, M. (1965). *Society and the adolescent self-image*. Princeton, NJ: Princeton University Press.
- Rosseel, Y. (2012). Lavaan: an R package for structural equation modeling. *J. Stat. Softw.* 48, 1–36. doi: 10.18637/jss.v048.i02
- Sakulku, J., and Alexander, J. (2011). The impostor phenomenon. *J. Behav. Sci.* 6, 75–97. doi: 10.14456/jbs.2011.6
- Sass, D. A. (2016). Testing measurement invariance and comparing latent factor means within a confirmatory factor analysis framework. *J. Psychoeduc. Assess.* 29, 347–363. doi: 10.1177/0734282911406661
- Selker, R., Love, J., Dropmann, D., and Moreno, V. (2022). *Jmv: the 'jamovi' analyses*. R package version 2.3.4. Available at: <https://CRAN.R-project.org/package=jmv>
- Sharpe, J. P., Martin, N. R., and Roth, K. A. (2011). Optimism and the big five factors of personality: beyond neuroticism and extraversion. *Personal. Individ. Differ.* 51, 946–951. doi: 10.1016/j.paid.2011.07.033
- Simon, M., and Choi, Y.-J. (2018). Using factor analysis to validate the Clance impostor phenomenon scale in sample of science, technology, engineering and mathematics doctoral students. *Personal. Individ. Differ.* 121, 173–175. doi: 10.1016/j.paid.2017.09.039
- Vergauwe, J., Wille, B., Feys, M., De Fruyt, F., and Anseel, F. (2015). Fear of being exposed: the trait-relatedness of the impostor phenomenon and its relevance in the work context. *J. Bus. Psychol.* 30, 565–581. doi: 10.1007/s10869-014-9382-5
- Walker, D. L., and Saklofske, D. H. (2023). Development, factor structure, and psychometric validation of the impostor phenomenon assessment: a novel assessment of impostor phenomenon. *Assessment* 30, 2162–2183. doi: 10.1177/10731911221141870
- Zakrisson, I. (2010). “Big Five Inventory (BFI): Utvärdering för svenska förhållanden,” in *Östersund: Social science reports from mid Sweden University*, vol. 3.



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EDITED BY

María del Mar Molero Jurado,
University of Almeria, Spain

REVIEWED BY

Maria Magdalena Stan,
University of Pitesti, Romania
Khadijeh Aghaei,
Gonbad Kavous University, Iran

*CORRESPONDENCE

Lijuan Fan
✉ fanlijuanwfust@163.com
Feng Cui
✉ CuiF79@163.com

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Mindfulness, self-efficacy, and self-regulation as predictors of psychological well-being in EFL learners

Lijuan Fan^{1*} and Feng Cui^{2*}

¹College of Teacher Education, Weifang University of Science and Technology, Weifang, China,

²School of Marxism, Shandong University of Aeronautics, Binzhou, Shandong, China

Introduction: Mindfulness, self-efficacy, and self-regulation play vital roles in shaping the psychological well-being of English as a Foreign Language (EFL) learners. This study investigates the interconnections among these constructs and their implications for the psychological well-being of 527 Chinese EFL learners.

Methods: A cross-sectional study was conducted among Chinese EFL learners enrolled in a university in China. Participants were recruited through a non-probability convenience sampling method from English language courses. They completed validated self-report questionnaires assessing mindfulness, self-efficacy, self-regulation, and psychological well-being. Structural Equation Modeling (SEM) and mediation analysis were employed to explore the relationships among these constructs.

Results: The study found that mindfulness and self-efficacy independently and directly predicted psychological well-being among Chinese EFL learners. Additionally, self-regulation emerged as a significant mediator in the relationship between mindfulness and psychological well-being, suggesting that mindfulness enhances well-being indirectly through improved self-regulation skills.

Discussion: These findings underscore the critical roles of mindfulness practices, self-efficacy beliefs, and self-regulation skills in promoting psychological well-being among EFL learners. The implications of this study extend to mindfulness-based interventions and programs designed. However, the study's cross-sectional design limits causal inference, and the use of self-report measures may introduce biases. Moreover, the sample's limited diversity and homogeneous demographic profile, attributed to the convenience sampling from a single university, may constrain the generalizability of the findings. Future research could adopt longitudinal designs and diverse participant samples to further elucidate these relationships and enhance the robustness of the findings.

KEYWORDS

mindfulness, self-efficacy, self-regulation, psychological well-being, structural equation modeling, English as a foreign language (EFL)

Introduction

In the present fast-paced world characterized by mounting pressures, rapid technological advancements, and intricate societal changes, the pursuit of psychological well-being emerges as a paramount aspiration transcending various facets of life (Houben et al., 2015). Psychological well-being is more than just the absence of mental distress; it encompasses the presence of positive emotions, a sense of purpose, and a profound fulfillment in our everyday pursuits (Keyes, 2002; Anglim et al., 2020). Achieving and sustaining this state of well-being is a complex journey shaped by numerous individual and contextual factors (Claro and Perelmiter, 2022; Xiyun et al., 2022).

One such influential factor is self-efficacy, a foundational concept in social cognitive theory, as proposed by Bandura (1977). Self-efficacy revolves around an individual's belief in their ability to not only execute tasks but also attain desired outcomes (Bandura, 1989). It stands as a potent predictor of motivation, performance, and persistence across a wide spectrum of domains, spanning from education and healthcare to personal development (Zimmerman, 2000; Livingi et al., 2021). Within the domain of psychological well-being, self-efficacy assumes a crucial role. Those possessing robust self-efficacy often approach challenges with resolute assurance, perceiving them as chances for personal development rather than formidable hurdles (Paciello et al., 2016; Phan, 2016).

Running parallel to self-efficacy is the concept of self-regulation, which encompasses the ability to monitor, control, and adapt one's thoughts, emotions, and behaviors in alignment with personal goals and standards (Carver and Scheier, 1998; Zimmerman and Kitsantas, 2014). Proficient self-regulation not only propels the pursuit of long-term objectives but also maintains emotional equilibrium, both of which are intrinsic to psychological well-being (Hofer et al., 2011; Balkis and Duru, 2016; Fomina et al., 2020). Individuals armed with robust self-regulation skills are better equipped to navigate stress, surmount setbacks, and sustain a profound sense of purpose in their endeavors (Schunk, 1994; Gagnon et al., 2016).

Furthermore, the cultivation of psychological well-being is intricately associated with mindfulness, characterized by a state of non-judgmental awareness of the present moment (Brown and Ryan, 2003). Mindfulness practices have demonstrated a capacity to reduce stress, enhance emotional regulation, and elevate life satisfaction (Hofmann et al., 2010; Tang et al., 2015; Goretzki and Zysk, 2017). Nevertheless, the potential interplay between self-efficacy, self-regulation, and mindfulness, and how these constructs collectively shape psychological well-being, remains an evolving area of inquiry.

To bridge this critical gap in the existing body of knowledge, this study embarks on an exploration of the interrelationships between self-efficacy, self-regulation, mindfulness, and psychological well-being. Through a comprehensive examination of these dynamic interactions, we aspire to offer nuanced insights that can inform targeted interventions and strategies aimed at fortifying psychological well-being within various contexts, ranging from educational settings to clinical practice and beyond.

The Chinese context might present a unique set of cultural and educational factors that can influence the interplay between self-efficacy, self-regulation, mindfulness, and psychological well-being in EFL learners. For instance, Chinese culture emphasizes collective goals and conformity, which may impact individuals' self-efficacy perceptions and self-regulation strategies (Zhu and Li, 2019).

Additionally, the competitive nature of Chinese education can place significant pressure on learners, potentially affecting their psychological well-being (Zhao, 2015).

The findings of this study might have important implications for language education, suggesting that enhancing self-efficacy, self-regulation, and mindfulness in EFL learners can promote their psychological well-being and overall language learning success. Language teachers can incorporate mindfulness-based interventions, self-efficacy-building activities, and self-regulation strategies into their instruction to foster a supportive and empowering learning environment. These interventions can help EFL learners manage stress, improve focus, and develop a growth mindset, which can positively impact their language learning experiences.

Specifically, mindfulness practices might help EFL learners become more aware of their thoughts and emotions, enabling them to better manage negative emotions and cultivate a sense of equanimity. Self-efficacy-building activities may instill in learners a belief in their ability to succeed in language learning, encouraging them to persist in the face of challenges. Self-regulation strategies can also equip learners with the skills to manage their time effectively, set realistic goals, and overcome procrastination, leading to improved language proficiency and overall well-being. By incorporating mindfulness, self-efficacy, and self-regulation into language instruction, educators can empower EFL learners to develop the resilience, adaptability, and emotional regulation skills necessary to thrive in both their language learning journeys and broader life experiences.

The literature review

Psychological well-being

The concept of psychological well-being is multifaceted and has been approached from various theoretical perspectives within the field of psychology. One prominent theoretical tradition, rooted in hedonism or the subjective well-being approach, characterizes well-being as synonymous with pleasure or happiness (Kahneman, 1999). This viewpoint encompasses three core components: contentment with life, the existence of favorable emotions, and the lack of adverse emotions, collectively termed as 'happiness' (Ryan and Deci, 2001). Empirical psychology has placed considerable emphasis on subjective well-being due to its associations with both physical and mental health. Factors such as life satisfaction, positive mood, hope, and happiness have been linked to various mental disorders (Seligman et al., 2006). This viewpoint underscores the importance of mental and physical preferences and pleasures (Zhang et al., 2022).

In contrast to the subjective well-being approach, an alternative perspective, termed the eudaimonic tradition, posits that psychological well-being centers on the acknowledgment and realization of an individual's innate potential (Ryff and Singer, 2008). This standpoint underscores an individual's feeling of self-governance, the significance and worth of their endeavors, and the caliber of their social connections. This theory is commonly denoted as eudaimonism or psychological well-being, underscoring the idea that well-being is attained through the expression of one's daimon or authentic essence (Houben et al., 2015).

While the eudaimonic approach was somewhat overshadowed by the subjective well-being perspective for an extended period (Wood

and Joseph, 2010), it has recently garnered empirical attention and become a focal point in clinical treatments (Casale et al., 2015). This shift is of considerable significance because psychological well-being and subjective well-being explore distinct facets of the human experience. In this study, psychological well-being is defined and assessed using the eudaimonic tradition, emphasizing an individual's sense of purpose in life, personal growth, and the quality of their relationships with others (Choi and Kim, 2016). This perspective delves into the profound aspects of human potential and fulfillment, offering an additional lens through which to understand the complex phenomenon of psychological well-being. It is this nuanced approach that guides our exploration of self-efficacy within the context of psychological well-being, where individuals' beliefs about their capabilities become central in the pursuit of a fulfilling and purpose-driven life.

Psychological well-being, a multi-dimensional construct, encompasses an individual's ability to not only experience positive emotions and life satisfaction but also effectively navigate and cope with negative emotions, recognizing them as an integral part of the human experience (Diener, 2006). It is essential to emphasize that the assessment of psychological well-being relies on subjective judgments rather than objective criteria, taking into account an individual's emotional history, memories, aspirations, values, and benchmarks for comparison (Biswas-Diener et al., 2004).

Cognitive elements also play a central role in shaping an individual's sense of well-being. Kafka and Kozma (2002) highlight that people tend to experience greater contentment when they perceive advancement within a context of their own choosing. Ryff (1989) foundational work further delineates the constituents of psychological well-being, covering autonomy, mastery over one's surroundings, the development of positive relationships, the pursuit of a meaningful life, personal growth, and self-acceptance. Extending upon this groundwork, Keyes (1998) advocates for the inclusion of the communal dimension within this framework, underscoring the significance of social connections in overall well-being. Seligman (2011) broadens this discussion by suggesting that psychological well-being possesses a multidimensional structure. He argues that it encompasses positive emotions, attachment, nurturing relationships, the quest for meaning, and a sense of achievement. In essence, psychological well-being goes beyond the absence of pathology, encapsulating a comprehensive assessment of one's life, experiences, body, mind, and surrounding circumstances (Diener, 2006; Fathi and Mohammaddokht, 2021).

This comprehensive understanding of psychological well-being sets the stage for our exploration of the predictors of well-being, including mindfulness, self-efficacy, and self-regulation. It highlights the need for a holistic approach that considers the interplay of cognitive, emotional, and relational factors in shaping individuals' psychological well-being.

Mindfulness

Mindfulness, stemming from ancient spiritual traditions, has received considerable attention for its profound impact on behavior and overall well-being (Baer et al., 2004; Crane, 2017). It entails a deliberate state of presence achieved by non-judgmentally focusing on one's objectives and fully immersing oneself in the present moment

(Brown and Ryan, 2003; Boyce, 2011). This quality is especially pertinent in the realm of psychological well-being, as excessive fixation on past memories and future possibilities can lead to increased anxiety and apprehension. Recent research has explored the intricate relationship between mindfulness and various psychological factors, including neuroticism, depression, and psychological distress (Armstrong and Rimes, 2016).

Mindfulness has emerged as a pivotal element in understanding and alleviating anxiety and anxiety-related disorders (Bamber and Schneider, 2016). It has proven effective in reducing both the physical and mental symptoms of anxiety. Moreover, mindfulness has shown its potential to help individuals confront factors that could threaten their performance and well-being. For example, study in Thailand highlighted the positive correlation between mindfulness and improvisational behavior in entrepreneurs, especially during challenging periods. Similarly, Charoensukmongkol and Puyod (2022) demonstrated mindfulness's ability to reduce emotional exhaustion among high-demand call center agents. These findings underscore the value of mindfulness training as a proactive strategy for individuals and organizations to mitigate the adverse consequences of stress and enhance overall well-being.

The evolution of mindfulness research has led to a broadening of its scope beyond its traditional Buddhist roots. Kabat-Zinn (2003), a pioneer in clinical applications, eloquently characterizes mindfulness as the awareness that arises from a deliberate, nonjudgmental focus on the unfolding of present moment experiences. Duan (2014), adopting a positive psychology perspective, views mindfulness as a trait that combines inherent and learned elements, closely linked to characteristics like inquisitiveness, receptivity, and an open-minded approach to the present moment (Kabat-Zinn, 2003).

Mindfulness research began with a focus on its applications in clinical medicine, where mindfulness-based interventions were found to significantly amplify positive emotions and mitigate negative ones, particularly in mood regulation and depression treatment (Teasdale et al., 2000). Beyond clinical settings, scholars unveiled mindfulness's potential in enhancing metacognition (Shapiro et al., 2006), promoting individual well-being (Brown and Ryan, 2003), and moderating negative emotions (Coffey et al., 2010). The integration of positive psychology into the field of education prompted an in-depth examination of the influence of mindfulness on academic emotions, revealing its role as a predictor and regulator of test anxiety (Wang and Zhao, 2015), a method for ameliorating attention and academic emotions in students with learning disabilities (Chen et al., 2019), and a tool for enhancing students' resilience against boredom and improving their commitment to academic endeavors (Galla et al., 2020; Mohammad Hosseini et al., 2023).

In an extensive systematic review, Lomas et al. (2017) confirmed the positive outcomes of mindfulness on individual well-being and workplace performance. Hoffman (2010) further substantiated this idea by emphasizing the potential enhancement of overall well-being through mindfulness exercises. Klusman et al. (2020) delved into the underlying mechanisms, suggesting that self-connection plays a pivotal role as an intermediary in the relationship between mindfulness and well-being. Research by Zollars et al. (2019) explored the effects of mindfulness meditation, finding it to make significant contributions to heightened mindfulness, mental well-being, and a reduction in perceived stress. Goretzki and Zysk (2017) extended the perspective to university students, demonstrating the potential of

mindfulness techniques to bolster both student welfare and academic performance.

These collective studies underscore the consistent and multifaceted advantages of integrating mindfulness practices across a range of domains, ultimately leading to improvements in individuals' overall well-being. The relevance of mindfulness to learners' psychological well-being, within the context of our research, is well-supported by this extensive body of literature.

Academic self-efficacy

According to Bandura's Social Cognitive Theory (Bandura, 1989), individuals are not passive recipients of external influences nor purely independent actors. They actively shape their motivation and behaviors within a system of reciprocal causation, which comprises actions, the environment, and personal factors, including self-efficacy beliefs. Self-efficacy, as defined by Bandura (1997), denotes one's confidence in effectively planning and executing actions needed to achieve specific goals. It reflects an individual's assurance in autonomously navigating complex situations and surmounting various challenges.

Within this framework of reciprocal causation, self-efficacy plays a pivotal role as a personal factor influencing human behavior through cognitive, motivational, and emotional processes (Bandura, 1989). It shapes human conduct by fostering constructive thought patterns, driving the exertion of effort, and influencing the experience of stress. Contextual and domain-specific factors are crucial considerations when assessing self-efficacy, as individuals' self-assessments of their capabilities can markedly vary under different circumstances (Bandura and Locke, 2003).

In an educational context, academic self-efficacy epitomizes individuals' belief in their ability to confidently navigate their educational journey. This concept centers on the expectation of competence and the capability to adeptly handle the academic challenges inherent in educational environments. Importantly, academic self-efficacy is closely interlinked with broader dimensions of self-efficacy and exhibits a substantial positive correlation with overall self-confidence, optimism, and social self-efficacy, which pertains to an individual's perceived capacity to initiate and sustain social interactions (Artino, 2012; Galla et al., 2014).

Academic self-efficacy forms the cornerstone of an individual's belief in their capacity to excel academically. It profoundly influences learners' approach to educational challenges and their persistence in academic endeavors. The intricate interaction between self-efficacy and academic achievement stands at the core of the educational landscape. When students possess a strong sense of academic self-efficacy, they view challenges as manageable stressors that can be surmounted, which, in turn, propels them toward persistent efforts to achieve their goals (Bandura, 1986; Schunk and Pajares, 2005). Attaining academic success, in return, elicits a pleasant affective response to learning, enhancing innate motivation and the perceived value of tasks. This sets in motion a positive feedback loop because individuals with greater scholarly efficacy perceptions tend to persist when confronted with adversity, ultimately reaching their goals and further reinforcing their academic self-efficacy (Lee et al., 2014). Conversely, students possessing diminished academic self-assurance could exhibit adverse reactions when confronted with scholastic

difficulties, potentially succumbing more easily to stressors. This, in turn, reinforces their unfavorable self-view, potentially culminating in a condition of acquired helplessness (Stipek, 1988).

In the sphere of education, this materializes as academic self-efficacy, particularly in the context of English language acquisition. Here, learners assess their proficiency in accomplishing academic tasks and meeting the demands of English language learning (Huang, 2013). The relevance of domain-specific self-efficacy beliefs becomes apparent, particularly in the arena of English language acquisition.

In China, there is a growing body of research dedicated to exploring self-efficacy in English learning, with a specific focus on college students, particularly those not majoring in English. However, there remains a dearth of research data concerning learners (Mo, 2012). Studies centered on middle school students primarily delve into the intricate interplay between self-efficacy in English learning and various educational facets, including learning motivation, emotional experiences in learning (Wang, 2017), and academic performance (Peng, 2018).

The concept of self-efficacy theory emphasizes that an individual's belief in their capabilities is not fixed but can be influenced by their prior achievements and setbacks (Bandura, 1989). Strong adaptability to learning environments suggests successful adjustment to these settings, ultimately boosting one's self-assurance. Previous research consistently illustrates a robust positive relationship between learning adaptability and the academic self-efficacy of middle school students (Zhang, 2012). Those with high self-efficacy not only possess confidence in their skills but also offer more favorable self-evaluations. Consequently, they invest more effort and cognitive resources when confronted with challenging tasks. On the flip side, those with diminished self-efficacy often gravitate toward avoidance tactics. As a result, academic self-efficacy demonstrates a strong interconnection with academic participation (Schunk and Pajares, 2005). Specifically, in the context of middle school students, their academic self-efficacy can be seen as a harbinger of their active involvement in the learning process (Li and Bai, 2018).

The amalgamation of these research endeavors collectively emphasizes the substantial connection between self-efficacy and overall wellness, with a particular focus on academic contexts. Phan's (2016) longitudinal investigation unveiled a pathway in which optimism and personal self-efficacy positively affect the wellbeing of students. Siddiqui (2015) concentrated on the undergraduate demographic, illustrating the influence of self-efficacy on psychological welfare, underscoring its pertinence in the academic sphere.

Etherton et al. (2022) extended this perspective by delving into the role of resilience in student performance and holistic wellness, accentuating the pivotal function of self-efficacy, self-determined objectives, and the amelioration of anxiety in attaining favorable outcomes. Paciello et al. (2016) took a person-centric approach, pinpointing discrete self-efficacy configurations that correspond with varying degrees of wellbeing within the academic milieu.

In a longitudinal study, Cobo-Rendón et al. (2020) underscored the interwoven nature of affective wellbeing, psychological welfare, self-efficacy, and academic achievement among first-year undergraduate students. In summation, these studies collectively offer persuasive substantiation for the indispensable role of self-efficacy in augmenting wellbeing, encompassing both the mental and educational dimensions, and its relevance throughout diverse phases of the educational journey.

Self-regulation

Self-regulation (SRL) stands as a foundational concept in educational psychology, particularly salient in the realm of second language acquisition (Zheng et al., 2018; Jansen et al., 2019). This intricate and dynamic construct forms the cornerstone of learner autonomy and self-determination (Dörnyei and Ryan, 2015). In the context of second language acquisition, SRL empowers language learners to take command of their cognitive, emotional, and behavioral facets, aligning them with their educational objectives (Zimmerman and Kitsantas, 2014). This transformative process facilitates the development of language proficiency, effectively bridging the divide between a learner's cognitive capacities and their linguistic aptitude (Dörnyei, 2005). The concept of self-regulation encompasses various interconnected processes, including goal-setting, progress monitoring, emotional regulation, and the utilization of strategic learning techniques, collectively spanning the entire language learning journey (Sitzmann and Ely, 2011). Learners are tasked with proactively determining what and how they learn, sustaining motivation by managing emotional responses, and adjusting strategies as they progress (Theobald, 2021). Self-regulation not only impacts linguistic proficiency but also profoundly shapes the overall learning experience (Kim et al., 2015). Learners adept at self-regulation are better equipped to overcome challenges and persevere in their language learning pursuits, ultimately leading to greater success in acquiring a foreign language (Teng and Zhang, 2016; Lei et al., 2022).

Additionally, self-regulated learning plays a pivotal role in learners' academic advancement, rooted in social cognitive theory. This theory posits that self-regulated learning arises from the dynamic interplay between personal attributes, behaviors, and environmental factors (Schunk, 2001). At the core of a self-regulated learner's belief system lies the concept of academic self-efficacy, as proposed by Bandura and Locke (2003). Academic self-efficacy, the confidence in one's ability to excel academically, forms the bedrock of one's sense of agency and serves as a key motivator in academic pursuits (Zimmerman, 2000).

From a cognitive standpoint, belief in one's abilities shapes the selection of academic activities and encourages a thoughtful approach to academic challenges (Panadero et al., 2017). This belief also fosters strategic attributions tied to one's sense of control. The understanding that current abilities can improve through effort is widely acknowledged as the most psychologically adaptable viewpoint (Weiner, 2005). It equips students with the understanding that they can master any subject matter by employing effective strategies, thereby promoting academic persistence and accomplishment.

From a motivational perspective, individuals characterized by elevated academic self-confidence frequently establish more challenging educational aspirations (Zimmerman and Kitsantas, 2014). The Achievement Goal Theory delineates two constructive learning goal classifications: mastery approach and performance approach. The former seeks to elevate competence, while the latter aims to showcase competence (Elliot, 2005). Research indicates that a combination of high mastery and high performance approach goal orientations may be the most psychologically adaptable, as they are associated with intrinsic interest and greater achievement (Harackiewicz et al., 2002).

The amalgamation of these research endeavors collectively highlights the complex interrelationship between self-regulation and

overall well-being, with diverse studies shedding light on various facets of this association. Fomina et al. (2020) undertook a longitudinal study spanning two waves, offering insights into the involvement of self-regulation during early adolescence and its impact on psychological health. Mascia et al. (2020) delved into the interplay between emotional intelligence, self-regulation, and smartphone addiction, exploring their influence on the well-being and quality of life of students. This research delved into how self-regulation competencies are intertwined with emotional intelligence and, consequently, contribute to the students' overall well-being.

In another study, Gagnon et al. (2016) delved into the significance of self-regulation within the sphere of medical practitioners and medical students, uncovering its connection to both well-being and the risk of burnout. This study underlines the necessity of nurturing self-help skills among these professionals. Balkis and Duru (2016) delved into the consequences of procrastination and self-regulation lapses on academic life satisfaction and emotional well-being, distinguishing between under-regulation and misregulation modes of self-regulation. Also, Hofer et al. (2011) considered the impact of identity and motives on self-regulation and overall well-being. Their research underscores the intricate link between self-regulation, one's sense of identity, and the underlying motivations, further influencing one's overall state of well-being. Overall, these studies collectively underscore the multifaceted role of self-regulation in shaping well-being, spanning various phases of life, occupational domains, and emotional dimensions.

Research hypotheses

H1: Mindfulness is directly related with psychological well-being

Mindfulness practices, encompassing meditation, deep breathing exercises, and awareness of present experiences, have been consistently associated with positive psychological outcomes. Existing literature supports the idea that engaging in mindfulness is directly linked to improved psychological well-being. Studies demonstrate that individuals practicing mindfulness exhibit lower stress levels (Khouri et al., 2015), reduced symptoms of anxiety and depression (Hofmann et al., 2010), and increased life satisfaction (Brown and Ryan, 2003). Moreover, the literature suggests that mindfulness is connected to enhanced emotional regulation and cognitive functioning, ultimately contributing to improved psychological well-being in areas such as self-awareness, emotional resilience, and cognitive clarity (Hoffman, 2010; Ager et al., 2015; Goretzki and Zysk, 2017; Lomas et al., 2017; Zollars et al., 2019; Klusman et al., 2020). Therefore, H1 is well-justified based on the existing literature.

H2: Self-efficacy is directly associated with psychological well-being

The hypothesis posits that high self-efficacy is directly linked to favorable psychological outcomes. Extending this, individuals with greater self-efficacy are expected to exhibit higher self-esteem, reduced stress levels, and an overall sense of well-being. The literature consistently supports this hypothesis, highlighting that individuals with high self-efficacy experience a heightened sense of mastery and

control, contributing significantly to their psychological well-being (Siddiqui, 2015; Paciello et al., 2016). This association has been well-documented across various studies in psychology, reinforcing the validity of H2 (Siddiqui, 2015; Paciello et al., 2016; Phan, 2016; Cobo-Rendón et al., 2020; Etherton et al., 2022).

H3: Self-regulation mediates the relationship between mindfulness and psychological well-being

Mindfulness practices inherently involve specific self-regulatory processes such as attention control and emotional regulation. Engaging in mindfulness is expected to cultivate enhanced self-regulation skills, contributing to heightened psychological well-being. The mediation hypothesis (H3) aligns with prior research indicating that self-regulation serves as a mediator in the relationship between mindfulness and psychological well-being (Chambers et al., 2008; Lundwall et al., 2019; Fathi et al., 2023). To provide further precision, attention control is specified as the cognitive dimension, and emotional regulation as the affective dimension of self-regulation in the mediation process.

H4: Self-regulation mediates the relationship between self-efficacy and psychological well-being

The interconnection between self-efficacy and self-regulation is well-documented. Individuals with elevated self-efficacy levels frequently exhibit enhanced self-regulation skills. These self-efficacious individuals are more inclined to engage in proactive and adaptive self-regulation behaviors, leading to improved psychological well-being. High self-efficacy is expected to drive individuals to set and diligently pursue their goals, while effective self-regulation strategies empower them to attain these objectives. Existing studies underscore that self-regulation acts as a mediator in the relationship between self-efficacy and psychological well-being. To provide further specificity, goal-setting, monitoring progress, and adaptive strategies are highlighted as dimensions of effective self-regulation in reinforcing the validity of H4 (Schunk, 1994; Paciello et al., 2016; Phan, 2016; Cobo-Rendón et al., 2020; Etherton et al., 2022).

Materials and methods

Participants

The participants consisted of 527 intermediate EFL learners, hailing from a diverse array of educational institutions situated in the northern and eastern regions of China. The participants were drawn from urban and rural settings, encompassing a spectrum of academic environments such as universities, secondary schools, and language training centers. This geographic diversity was strategically designed to enrich the generalizability of the study findings beyond specific institutional contexts. For instance, participants from urban areas might be exposed to different educational resources and socio-cultural influences compared to their counterparts in rural settings, contributing to a more nuanced understanding of the impact of mindfulness, self-efficacy, and self-regulation on psychological well-being.

The participant distribution was meticulously balanced in terms of gender, with 246 male participants, constituting 46.7% of the total cohort, and 281 female participants, representing 53.3% of the sample. This gender equilibrium sought to minimize potential gender-related biases in the study's outcomes. The participants' ages ranged from 18 to 30 years old, with an average age of 21.93 (SD = 2.14). This age range is representative of the typical age group of intermediate EFL learners in China. Educational background was another important demographic factor taken into account. The participants were enrolled in various educational institutions, including universities, vocational schools, and language institutes. The diverse educational backgrounds aimed to encompass a variety of learning environments and experiences, contributing to the generalizability of the study findings across different educational settings.

Selection of participants was methodically carried out to ensure a uniform and consistent level of English proficiency across the cohort. All participants were required to possess an intermediate level of competence in the English language, which was determined through standardized language proficiency assessments and validated placement tests. This rigorous selection criterion guaranteed that participants shared a common baseline level of language skills.

To assemble this diverse yet academically homogeneous cohort, a convenience sampling method was employed. This method was chosen for its practicality in accessing a broad spectrum of intermediate EFL learners while maintaining the desired level of English proficiency within the scope.

Measures

Academic self-efficacy

To assess academic self-efficacy, the subscale derived from the Motivated Strategies for Learning Questionnaire (MSLQ; Pintrich and De Groot, 1990) was employed. This subscale, consisting of items such as "I expect to do well in this class," was carefully translated into Chinese and subsequently back-translated into English to ensure cultural equivalence. The average item score was computed and standardized to represent academic self-efficacy within the model.

The MSLQ subscale was used as an appropriate measure of academic self-efficacy given its established psychometric properties and its alignment with the theoretical framework of the study. This subscale has demonstrated strong internal consistency ($\alpha = 0.87$) and convergent validity with other measures of self-efficacy (Pintrich and De Groot, 1990).

Mindfulness

The Mindful Attention Awareness Scale (MAAS; Brown and Ryan, 2003) was employed to assess mindfulness. This 15-item instrument, featuring statements such as "I often work automatically on tasks without being aware of what I am doing," utilizes a six-point Likert scale ranging from most always (1) to almost never (6). The MAAS has exhibited robust internal consistency ($\alpha = 0.96$) and excellent convergent and discriminant validity (Bajaj et al., 2016).

The MAAS was employed due to its established psychometric properties and its strong alignment with the conceptualization of mindfulness as non-judgmental awareness of the present moment. The MAAS has been widely used in empirical research and has

demonstrated its ability to capture the essence of mindfulness among Chinese adolescents (Black et al., 2012).

Self-regulation

The Short Self-Regulation Questionnaire (SSRQ; Carey et al., 2004), comprising 31 items such as “I usually keep track of my progress toward my goals,” was employed to assess self-regulation. Participants rated their agreement on a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The SSRQ exhibited high internal consistency in the current study, with a Cronbach's alpha coefficient of 0.92. The SSRQ was chosen due to its comprehensive assessment of various dimensions of self-regulation, including goal setting, planning, and perseverance. The SSRQ has demonstrated adequate reliability and validity in previous research in Chinese settings (e.g., Chen and Lin, 2018).

Psychological well-being

To gauge participants' psychological well-being, the study employed the Psychological Well-Being Scale, developed by Ryff and Keyes (1995). This instrument consists of 18 items, each designed to measure various dimensions of well-being, including favorable interpersonal connections, individual development, self-acknowledgment, a sense of purpose, self-determination, and adeptness in handling one's surroundings. Participants rated their agreement using a scale ranging from strongly disagreed (1) to strongly agreed (7). The scale holds a firm and established position in the academic corpus, having been extensively employed in prior research endeavors (Ryff and Keyes, 1995).

The PWB was chosen due to its comprehensive assessment of the multidimensional nature of psychological well-being. The PWB has demonstrated strong psychometric properties, including high internal consistency and convergent and discriminant validity in Chinese context (Gao and McLellan, 2018).

Data collection procedure

The recruitment process for this study was meticulously planned in collaboration with educational institutions situated in the northern and eastern regions of China. Formal informed consent was obtained from these institutions, granting permission to access their students for research purposes. In alignment with institutional protocols, participants were approached with utmost transparency and clarity regarding their participation in the study.

Before the initiation of data collection, each participant received a brief pre-survey questionnaire. This questionnaire assessed participants' familiarity with the study's constructs, identifying any areas of ambiguity or misinterpretation. The insights gained from this questionnaire prompted additional clarification during the informed consent process, ensuring a comprehensive understanding of the study.

Upon completion of the study, participants were thanked sincerely for their valuable contributions, and gratitude was expressed for their active participation. To further recognize their involvement, participants were offered research participation credit, contributing toward their course requirements and providing them with a tangible benefit.

In addition to the tangible benefits, participants were reminded of the opportunity for self-reflection during the study. Engaging in the survey allowed participants to reflect on their mindfulness,

self-efficacy, self-regulation, and psychological well-being. This opportunity for self-reflection was emphasized as a potential intrinsic benefit of participation.

To facilitate data collection, a well-structured questionnaire was administered through a secure online platform. Each participant received a unique access link, a crucial measure to maintain the confidentiality and security of their responses. The online platform provided participants with the flexibility to complete the survey at their convenience, ensuring that they could allocate the necessary time without feeling undue pressure. The estimated duration for survey completion typically ranged from 20 to 30 min.

In accordance with ethical standards, stringent safeguards were implemented to protect the anonymity and confidentiality of each participant. Personal information was kept distinctly separated from the collected data, and all responses were securely stored. Access to the data repository was restricted exclusively to authorized members of the research team, reinforcing the protection of participants' sensitive information.

Ethical considerations

Pursuant to the ethical principles of research, the present study adhered to the highest standards of conduct and adhered to the ethical guidelines set forth by the College of Teacher Education, Weifang University of Science and Technology. Prior to commencing data collection, the study protocol was meticulously reviewed and approved by the College's Institutional Review Board (IRB). This approval ensured that the study's methodology and procedures aligned with ethical principles and safeguarded the well-being of participants.

To protect the privacy and anonymity of participants, informed consent forms were obtained from all participants. These forms clearly outlined the study's objectives, procedures, potential risks and benefits, and the voluntary nature of participation. Participants were informed that they were free to withdraw from the study at any point without penalty.

Confidentiality was paramount, and all personal information collected from participants was handled with the utmost care. Participants' responses were assigned unique identifiers to maintain their anonymity, and data was stored securely in password-protected electronic files. Also, the research team emphasized transparency and open communication throughout the study. Participants were kept informed of the progress of the study, and their feedback was actively sought and incorporated into the research process.

Analytic approach

The data analysis procedure in this study encompassed a series of methodical steps designed to explore the interrelationships among the variables and rigorously test the research hypotheses. To this end, a comprehensive analytical framework was employed. Initial analyses involved descriptive and correlation assessments, executed through SPSS version 28.0, aimed at illuminating the characteristics of the variables and elucidating their associations.

Structural Equation Modeling (SEM) was employed with the use of the Amos program (version 26.0) as the primary analytical method for several reasons. First, SEM is a powerful statistical tool that allows for the simultaneous assessment of complex relationships among multiple variables. This capability was essential for our study, as we sought to investigate the intricate interplay between mindfulness, self-efficacy, self-regulation, and psychological well-being.

Second, SEM enables the examination of both direct and indirect effects, providing a more comprehensive understanding of the mechanisms underlying the observed associations. This feature was crucial for our research, as we hypothesized that mindfulness indirectly influenced psychological well-being through self-efficacy and self-regulation. SEM allowed us to quantify these indirect effects, providing a deeper insight into the mediating role of these variables.

Third, SEM offers a rigorous framework for evaluating the overall fit of the proposed model to the data. This assessment is crucial for ensuring that the model accurately represents the underlying relationships among the variables. An array of fit indices was strategically employed to gauge the overall adequacy of the proposed model. Central to this assessment was the χ^2 -goodness of fit to degree of freedom (df) ratio, where a value below 3 was indicative of a satisfactory fit. Additionally, the Goodness of Fit Index (GFI) and the Comparative Fit Index (CFI) played pivotal roles in the evaluation. A GFI and CFI value equal to or greater than 0.90 was considered indicative of a well-fitting model.

Further scrutiny was undertaken through the evaluation of the Root-Mean-Square Error of Approximation (RMSEA) and the Standardized Root-Mean-Square Residual (SRMR) as additional indicators of model fit. Conventionally, an RMSEA value below 0.08 and an SRMR value under 0.10 were regarded as robust evidence of a model that fits well with the data, in alignment with established criteria (Huang and Bentler, 1999).

Results

In the initial phase of our analysis, we conducted preliminary assessments to ensure data quality and adherence to assumptions before proceeding with the proposed model. These critical preliminary analyses were carried out using SPSS version 28, encompassing a thorough examination of missing data, normality, and potential outliers, in line with established practices (Tabachnick and Fidell, 2007).

Addressing missing data is a crucial step in data preparation. In cases of substantial missing data, methods like list-wise deletion or pair-wise deletion are often impractical, particularly when dealing with smaller sample sizes. Given the context of our study and the prevalence of missing data, we opted for the Expectation–Maximization (EM) algorithm, an effective imputation technique that replaces missing data points with estimated values (Kline, 2015). Subsequently, we examined the normality of our data by assessing skewness and kurtosis indices for each item. A skewness or kurtosis value exceeding ± 2.0 is indicative of a non-normal distribution. Items displaying such characteristics were meticulously identified and subsequently removed from our dataset.

Furthermore, we conducted a comprehensive evaluation to detect univariate and multivariate outliers. To identify univariate outliers, Z-standardized scores were employed, and for multivariate outliers, the Mahalanobis D^2 measure was applied, all in accordance with established guidelines (Tabachnick and Fidell, 2007). Outliers, once identified, were systematically removed from the dataset.

In our pursuit of rigorous data analysis, we embarked on a comprehensive examination of construct validity following the initial data screening procedures. To assess the suitability of our measurement models, we employed Confirmatory Factor Analysis (CFA) and scrutinized the performance of these models using various goodness-of-fit indices (Hair et al., 1998). This process involved the evaluation of measurement models for all latent constructs, including those yet to be mentioned.

It is noteworthy that a subset of the initial measurement models did not exhibit a satisfactory fit with our dataset. To rectify this, deliberate model adjustments were undertaken to enhance their alignment with the empirical data. Specifically, this optimization process involved the removal of three items from our scales, which showed factor loadings falling below the recommended threshold of 0.40. Additionally, we introduced two correlational paths between error terms associated with two latent constructs, thereby refining the models.

Following these strategic modifications, the final measurement models emerged with a commendable level of fit, as comprehensively detailed in Table 1. This signifies the successful alignment of our measurement models with the empirical data, reaffirming their efficacy in capturing the underlying constructs.

Moreover, to extend our understanding of the factors under investigation, we conducted an exploration of the descriptive statistics and correlations for all variables, a summary of which is thoughtfully presented in Table 2. Descriptive statistics revealed that the mean score for mindfulness was 3.42 (SD = 0.62). For self-efficacy, the mean score was 2.94 (SD = 0.56), and for self-regulation, the mean score was 3.16 (SD = 0.85). Additionally, the mean score for psychological well-being was 4.03 (SD = 0.64).

Correlation analyses were conducted to examine the relationships between these variables. Mindfulness was found to have a significant positive correlation with self-efficacy ($r = 0.23^*$, $p < 0.05$) and self-regulation ($r = 0.44^{**}$, $p < 0.01$). Self-efficacy and self-regulation were also positively correlated ($r = 0.49^{**}$, $p < 0.01$). Furthermore, mindfulness, self-efficacy, and self-regulation exhibited significant positive correlations with psychological well-being, with correlation coefficients of 0.30^{**} , 0.42^{**} , and 0.53^{**} , respectively, all at $p < 0.01$. These findings indicate that the study variables are interrelated, with significant positive correlations between mindfulness, self-efficacy, self-regulation, and psychological well-being, supporting the hypothesized relationships.

TABLE 1 The outcome of measurement model.

	χ^2	df	χ^2/df	CFI	TLI	RMSEA
Mindfulness	87.12	43	2.02	0.94	0.93	0.05
Self-efficacy	104.13	54	1.92	0.95	0.94	0.04
Self-regulation	56.22	31	1.81	0.97	0.97	0.04
Well-being	338.24	204	1.65	0.98	0.97	0.03

TABLE 2 Descriptive statistics.

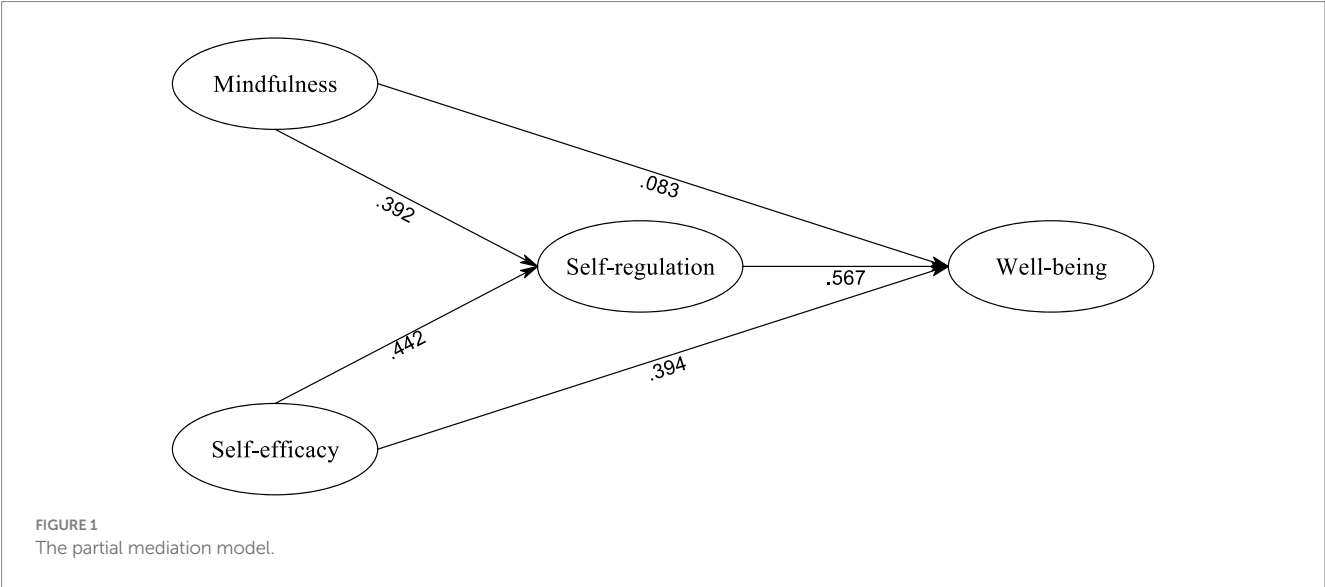
	<i>M (SD)</i>	1	2	3	4
1. Mindfulness	3.42 (0.62)	1.00			
2. Self-efficacy	2.94 (0.56)	0.23*	1.00		
3. Self-regulation	3.16 (0.85)	0.44**	0.49**	1.00	
4. Well-being	4.03 (0.64)	0.30**	0.42**	0.53**	1.00

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

TABLE 3 Results of fit indices of alternative models.

Model	χ^2	df	$\Delta\chi^2$	GFI	CFI	RMSEA	TLI	SRMR
Direct effect model	865.432**	440	–	0.832	0.912	0.068	0.901	0.182
Full mediation model	789.211**	436	76.221	0.841	0.943	0.051	0.928	0.071
Partial mediation model	723.345**	432	65.866	0.859	0.961	0.044	0.953	0.062

** p -value < 0.001 , $\Delta\chi^2$, difference in chi-square values between the model and the subsequent model.



Furthermore, we probed for potential gender-related differences in our constructs by subjecting our data to four distinct independent-samples t -tests. These analytical efforts aimed to unearth any significant disparities between male and female participants in relation to the four core constructs. Notably, these rigorous tests revealed no statistically significant differences, underscoring the robustness and generalizability of our findings across gender groups.

Upon establishing the satisfactory fit of the measurement model, we proceeded to scrutinize various structural models, thereby putting our research hypotheses to the test. Initially, we conducted a comparative analysis between the hypothesized partial mediation model and the full mediation model. The latter involved setting all path coefficients from the predictor variables to the outcome variable to zero. In addition, we explored a rivaling direct model, in which all path coefficients to and from the mediator variable were constrained to zero.

Table 3 presents an examination of the fit indices pertaining to the alternate models, offering valuable insights into their capacity to elucidate the observed dataset. These indices are pivotal in assessing the models' goodness of fit. As depicted in Table 3, the partial

mediation model demonstrated superior fit indices [$\chi^2(432) = 7253.345$, $GFI = 0.859$, $CFI = 0.961$, $RMSEA = 0.044$, $TLI = 0.953$, $SRMSR = 0.062$].

Figure 1 illustrates the path diagram and parameter estimates for the partial mediation model, which exhibited a highly favorable fit concerning our dataset. Within Figure 1, it becomes evident that all path coefficients displayed statistical significance, with a single exception: the path linking mindfulness and psychological well-being did not attain statistical significance.

Table 4 displays the standardized path coefficients and t -values for the three structural models: the Direct Effects Model, the Full Mediation Model, and the Partial Mediation Model, analyzed using the Baron and Kenny (1986) method.

In the Direct Effects Model, several direct relationships were found to be statistically significant. The association between self-efficacy and well-being ($\beta = 0.426$, $t = 6.19^{***}$) revealed a strong direct effect. Similarly, the link between self-efficacy and self-regulation ($\beta = 0.435$, $t = 6.13^{***}$) was highly significant. The path from self-regulation to well-being ($\beta = 0.597$, $t = 7.48^{***}$) also demonstrated a significant and robust relationship. In contrast, the relationship

TABLE 4 Path estimates of structural model.

	Standardized path coefficients (t-value)		
	Direct model	Full model	Partial model
Self-efficacy → well-being	0.426 (6.19***)		0.394 (4.81**)
Mindfulness → well-being	0.136 (2.91*)		0.083 (1.09)
Self-efficacy → self-regulation		0.435 (6.13***)	0.442 (6.37***)
Mindfulness → self-regulation		0.356 (4.52**)	0.392 (4.80**)
Self-regulation → well-being		0.597 (7.48***)	0.567 (7.34***)

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

between mindfulness and well-being exhibited a smaller coefficient and was marginally significant ($\beta = 0.136$, $t = 2.91^*$).

In the full mediation model, both the paths from self-efficacy to well-being and from mindfulness to well-being were mediated by self-regulation. In this model, the relationships between self-efficacy and self-regulation ($\beta = 0.442$, $t = 6.37^{***}$) and between mindfulness and self-regulation ($\beta = 0.392$, $t = 4.80^{**}$) were highly significant. These indirect paths clarified the connections between self-efficacy and mindfulness and well-being.

The partial model provided the best fit to the data. In this model, self-regulation mediated the relationships between mindfulness and well-being ($\beta = 0.083$, $t = 1.09$). In other words, mindfulness was related to well-being via the mediation of self-regulation ($0.392 \times 0.567 = 0.222$). This suggests that while self-regulation plays a crucial role in explaining the relationship between these variables, there are additional factors contributing to the association between mindfulness and well-being.

Overall, the results from the Baron and Kenny (1986) method, as depicted in Table 4, indicate that the Partial Mediation Model offers the most suitable and comprehensive explanation of the relationships among self-efficacy, mindfulness, self-regulation, and well-being in this research framework.

Discussion

The purpose of this study was to examine the interrelationships among mindfulness, self-efficacy, self-regulation, and their collective influence on the psychological well-being of individuals. In light of the growing significance of mental well-being in contemporary society, this research sought to unravel the intricate dynamics between these psychological constructs and shed light on how they jointly contribute to the overall psychological well-being of individuals, particularly in the context of EFL learners.

First, it was found that mindfulness directly correlates with the psychological well-being of EFL learners. This revelation harmonizes with an expanding body of research, further enriching our comprehension of how mindfulness practices can exert a positive influence on well-being within educational settings (e.g., Hoffman, 2010; Goretzki and Zysk, 2017; Lomas et al., 2017). The robust positive relationship between mindfulness and psychological well-being has been well-documented across diverse contexts, including educational environments (Chiesa and Serretti, 2009; Ager et al., 2015; Goretzki and Zysk, 2017; Zollars et al., 2019; Klussman et al., 2020). Our finding injects a fresh perspective by specifically underscoring the significance of mindfulness for EFL learners. These learners grapple with unique

stressors, such as language barriers, cultural adaptation, and academic demands, all of which can profoundly impact their psychological well-being (Pan et al., 2023). By fostering self-awareness and emotional regulation, mindfulness practices offer EFL learners invaluable tools to navigate these challenges (Fathi et al., 2023).

The intricate connection between mindfulness and well-being in the domain of EFL learning is illuminated through a constellation of compelling mechanisms. Mindfulness practices, encompassing meditation and deep breathing exercises, have proven remarkably effective in assuaging stress and anxiety, common challenges encountered by EFL learners (Tang et al., 2015). For instance, mindfulness meditation's ability to cultivate present-moment awareness and non-judgmental acceptance of thoughts and emotions effectively neutralizes the debilitating effects of stress, a significant concern for language learners navigating linguistic hurdles. Furthermore, mindfulness fosters self-compassion and self-acceptance, two cornerstones of psychological well-being. These qualities, nurtured by mindfulness's cultivation of non-judgmental awareness, empower EFL learners to embrace their imperfections and navigate language learning challenges with resilience and composure (Neff, 2003; Hoffman, 2010; Ager et al., 2015; Lomas et al., 2017).

In addition, mindfulness's transformative power extends beyond stress reduction and self-compassion, also bolstering cognitive and emotional resilience in the face of language learning challenges. This heightened resilience empowers EFL learners to approach language acquisition with unwavering determination and composure, enabling them to navigate setbacks and obstacles with resilience (Lomas et al., 2017; Fathi et al., 2023). Mindfulness cultivates a heightened state of attentiveness, sharpening the focus and concentration that are indispensable for effective language learning (Xue et al., 2019). This enhanced ability to concentrate allows EFL learners to immerse themselves fully in the linguistic landscape, absorbing grammatical nuances, vocabulary richness, and cultural subtleties with greater precision.

The heightened perceptiveness fostered by mindfulness extends beyond linguistic cues to encompass cultural nuances. Mindfulness allows EFL learners to appreciate the subtle cultural contexts surrounding language, enabling them to engage with the target language not as an isolated system but as an integral part of a vibrant cultural tapestry (Zeilhofer and Sasao, 2022). This deeper level of understanding fosters a more authentic and enriching language learning experience.

Second, our research unravels a vital revelation: self-efficacy directly associates with the psychological well-being of EFL learners. This revelation resonates with the existing body of knowledge that

highlights the intricate interplay between self-efficacy and well-being (Siddiqui, 2015). The robust positive connection between self-efficacy and psychological well-being has been extensively documented in psychological research spanning a multitude of domains (Paciello et al., 2016; Phan, 2016; Cobo-Rendón et al., 2020; Etherton et al., 2022). Self-efficacy, as Bandura (1977) meticulously defined, refers to an individual's belief in their capacity to perform tasks and surmount challenges. In the context of EFL learners, self-efficacy emerges as a potent psychological construct that profoundly shapes their language learning experiences (Hsieh and Kang, 2010). Learners with elevated self-efficacy tend to approach language acquisition with heightened motivation, unwavering persistence, and admirable resilience (Oxford, 1990; Mutlu et al., 2019). This, in turn, significantly contributes to elevated levels of psychological well-being (Cobo-Rendón et al., 2020).

The intricate relationship between self-efficacy and psychological well-being can be elucidated through various compelling mechanisms. EFL learners who harbor heightened self-efficacy are inherently inclined to set ambitious language-learning goals, propelled by their firm belief in their ability to attain them. The triumphant accomplishment of these challenging objectives invariably bestows upon them an augmented sense of competence and satisfaction, thus positively influencing their psychological well-being (Schunk and Pajares, 2005; Etherton et al., 2022).

Furthermore, self-efficacy plays an integral role in stress reduction and coping strategies (Pinel, 2013). EFL learners often encounter language-related stressors, including the apprehension of speaking in public or making errors. However, those endowed with high self-efficacy are better equipped to handle such stressors, driven by their unshakeable belief in their capacity to navigate these demanding situations. This, in turn, contributes to diminished levels of anxiety and fosters an elevated state of psychological well-being (Mills et al., 2006). Intriguingly, self-efficacious individuals exhibit a predilection for deploying more effective self-regulation strategies in their learning endeavors (Bouffard-Bouchard et al., 1991). This penchant for setting and achieving goals, monitoring their own learning progress, and adapting strategies as needed manifests as a sense of control over their linguistic journey (Yabukoshi, 2021; Rahimi and Fathi, 2022). Such mastery over self-regulation, in itself, is intrinsic to psychological well-being, as substantiated by the corpus of research in the field (Schunk, 1994; Zimmerman and Schunk, 2001).

In addition, our investigation brings to light a pivotal revelation: self-regulation acts as the linchpin in the intricate relationship between mindfulness and psychological well-being. Mindfulness, characterized by an unbiased awareness of the present moment, has been extensively linked to a spectrum of favorable outcomes for psychological well-being. These encompass a reduction in stress, anxiety, and depression (Hofmann et al., 2010), an upswing in life satisfaction (Brown and Ryan, 2003), and an enhancement in emotional regulation (Tang et al., 2015). However, the precise mechanisms through which mindfulness engenders these positive effects have garnered recent scholarly interest.

Our findings underscore the instrumental role of self-regulation as the mediator in translating mindfulness into augmented psychological well-being. Self-regulation, denoting an individual's aptitude to govern and direct their thoughts, emotions, and behaviors, is actively fostered through mindfulness practices (Schunk, 1994). These practices cultivate heightened awareness of one's thoughts and

emotions, and furnish techniques to manage and channel them in a non-reactive, adaptive manner.

This finding is closely aligned with prior investigations that have demonstrated the augmentative impact of mindfulness practices on self-regulation (Leyland et al., 2019). For instance, mindfulness meditation has been shown to bolster attentional control and emotional regulation (Ostafin et al., 2015; Tang et al., 2015). By honing these self-regulation skills, individuals are better equipped to navigate stress, anxiety, and negative emotions, culminating in an overall enhancement of psychological well-being. This intrinsic connection between self-regulation and well-being is substantiated by a wealth of existing literature (e.g., Balkis and Duru, 2016; Gagnon et al., 2016; Fomina et al., 2020; Mascia et al., 2020).

Moreover, a seminal study by Chambers et al. (2008) unveils that self-regulation functions as the conduit through which mindfulness imparts its positive effects on well-being, even within clinical populations. This indicates that the mediating mechanism we observe extends its influence not only to general populations but also to those facing specific mental health challenges. These findings collectively fortify our result, further cementing the indispensable role of self-regulation in mediating the intricate relationship between mindfulness and psychological well-being.

Finally, our study unveils a critical pathway that elucidates the dynamic interplay between self-efficacy, self-regulation, and psychological well-being. At its core, self-efficacy, in accordance with Bandura's seminal work (1977), signifies an individual's conviction in their ability to not only perform tasks but also surmount challenges. This belief exerts a profound influence on motivation, goal-setting, and overall behavioral patterns (Bandura, 1989). When individuals possess high self-efficacy, they are more inclined to set ambitious goals, fueled by their unwavering belief in their capacity to attain them (Hawe et al., 2019). These proactive endeavors, in turn, serve as catalysts for an enhanced state of well-being (Schunk and Pajares, 2005; Mascia et al., 2023).

Central to this nexus is the pivotal role played by self-regulation, defined as an individual's capacity to govern and orchestrate their thoughts, emotions, and behaviors. Those endowed with high self-efficacy demonstrate a remarkable aptitude for effective self-regulation, driven by their unshakable belief in their capabilities (Feldmann et al., 1995). This dynamic self-regulation process becomes a linchpin, contributing significantly to the augmentation of psychological well-being (Gagnon et al., 2016; Mascia et al., 2020).

Our findings harmonize with previous research, echoing the sentiment that self-regulation is a linchpin in goal pursuit and personal growth (Zimmerman and Schunk, 2001; Dignath et al., 2008). Individuals with heightened self-efficacy demonstrate superior self-regulation skills, adept at setting and monitoring their progress toward their objectives. This mastery over self-regulation not only affords them a heightened sense of control but also fosters a pervasive feeling of competence, thereby positively impacting psychological well-being (Balkis and Duru, 2016; Gagnon et al., 2016; Fomina et al., 2020). This illuminates the expansive reach of self-efficacy, not only in motivating and goal-setting, but also in influencing an individual's capacity for self-regulation (Trautner and Schwinger, 2020). Our findings extend this intricate relationship to the realm of psychological well-being, providing further validation for the indispensable mediating role of self-regulation in this intricate interplay. In essence, our study reaffirms and amplifies the understanding of how

self-efficacy, underpinned by robust self-regulation, contributes significantly to the cultivation and sustenance of psychological well-being.

Conclusion

In summary, our research has revealed the intricate interplay between self-efficacy, self-regulation, and psychological well-being. We have shown that self-efficacy significantly influences one's psychological well-being, with self-regulation acting as a vital mediator in this relationship. Individuals with high self-efficacy tend to demonstrate enhanced self-regulation skills, which, in turn, contribute to their improved mental health. This discovery aligns with existing literature on self-efficacy and self-regulation, further highlighting their importance in fostering psychological well-being. Our study underscores the critical need to promote self-efficacy and self-regulation in various contexts, including education, clinical psychology, and personal development efforts. Interventions aimed at enhancing these psychological constructs can have profound effects on individuals' overall mental health. By recognizing the mediating role of self-regulation, we have provided a more comprehensive understanding of the pathways through which self-efficacy impacts psychological well-being. Ultimately, our research highlights the potential for targeted interventions and strategies to enhance self-efficacy and self-regulation, providing individuals with the means not only to achieve their goals but also to enhance their psychological well-being. This knowledge constitutes a valuable contribution to the broader field of psychology and personal development.

The implications of our findings extend to various domains, spanning education, clinical psychology, and individual well-being enhancement. Educators are empowered to play a crucial role in nurturing self-efficacy and self-regulation among students. They can employ strategies that encourage goal setting, provide constructive feedback, and promote self-monitoring to foster self-efficacy. Simultaneously, the development of self-regulation skills can be seamlessly integrated into teaching methodologies, equipping students with the tools to manage their learning effectively. This, in turn, can lead to improved psychological well-being and academic success.

Furthermore, in the realm of clinical psychology, therapists and mental health practitioners are poised to enhance their interventions by incorporating self-efficacy-building activities. By recognizing the mediating role of self-regulation in the relationship between self-efficacy and psychological well-being, therapists can tailor their approaches to enhance both self-efficacy and self-regulation in their clients. This approach can result in more comprehensive and effective treatments for psychological well-being. For individuals seeking to improve their psychological well-being, our findings offer valuable guidance. By focusing on self-efficacy and self-regulation enhancement, individuals can engage in activities that challenge and expand their self-efficacy beliefs, set achievable goals, and practice self-regulation strategies. This approach can have a positive impact on their mental health and overall well-being.

The findings of our study contribute to a growing body of research exploring the interrelationships between self-efficacy, self-regulation, and psychological well-being in EFL learners. However, several limitations warrant consideration to further enhance the study's depth and generalizability. Firstly, the cross-sectional design of our study,

which involved collecting data at a single point in time, restricts our ability to establish causal relationships between variables and to fully capture the dynamic nature of the constructs examined. Longitudinal studies that track participants over time would provide a more nuanced understanding of how these constructs evolve and interact with each other over an extended period.

Secondly, the reliance on self-report measures, while insightful, may introduce biases or inaccuracies due to social desirability or memory limitations. To strengthen the validity of our findings, future research could consider complementing self-reports with objective measures, such as behavioral observations or physiological data, which would provide independent assessments of the constructs under investigation. Thirdly, the limited sample representation, consisting of EFL learners from a single university in China, raises concerns about the generalizability of our findings to broader populations with diverse cultural backgrounds, educational levels, and socioeconomic backgrounds. Expanding the sample and ensuring representation from a wider range of individuals would enhance the applicability of our results to a broader spectrum of EFL learners.

In addition, while our study provided evidence for the mediating role of self-regulation in the relationship between self-efficacy and psychological well-being, further exploration of the underlying mechanisms is needed. Delving deeper into the precise processes by which self-regulation fosters psychological well-being among EFL learners would provide a more comprehensive explanation for the observed associations. Finally, the absence of control variables in our study, such as personality traits, coping strategies, and life stressors, could have influenced the relationships between the constructs examined. Incorporating these control variables in future research would allow for a more rigorous examination of the direct and indirect effects of self-efficacy, self-regulation, and psychological well-being on each other.

In summary, our research contributes to the understanding of the intricate interplay between self-efficacy, self-regulation, and psychological well-being. We emphasize the need for interventions promoting self-efficacy and self-regulation in various contexts, including education, clinical psychology, and personal development. Educators, therapists, and individuals seeking to enhance their well-being can benefit from our findings, which provide valuable guidance for incorporating strategies that challenge and expand self-efficacy beliefs and foster effective self-regulation. While our study offers valuable insights, it is crucial to acknowledge its limitations, such as the cross-sectional design and reliance on self-report measures. Future research should explore the dynamic nature of these constructs longitudinally and consider diverse samples for broader generalizability. Additionally, further investigations into the specific mechanisms underlying the mediation of self-regulation in the relationship between self-efficacy and psychological well-being are warranted.

Data availability statement

The data analyzed in this study is subject to the following licenses/restrictions: the raw data supporting the conclusions of this article will be made available by the authors, without undue reservation. Requests to access these datasets should be directed to LF, fanlijuanwfust@163.com.

Ethics statement

The studies involving humans were approved by College of Teacher Education, Weifang University of Science and Technology, Weifang 262700, China. 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

LF: Conceptualization, Data curation, Formal analysis, Funding acquisition, Investigation, Methodology, Project administration, Resources, Software, Supervision, Validation, Visualization, Writing – original draft, Writing – review & editing. FC: Conceptualization, Data curation, Formal analysis, Funding acquisition, Investigation, Project administration, Resources, Software, Supervision, Visualization, Writing – original draft, Writing – review & editing.

References

- Ager, K., Albrecht, N., and Cohen, M. (2015). Mindfulness in schools research project: exploring students' perspectives of mindfulness-what are students' perspectives of learning mindfulness practices at school? *Psychology* 6, 896–914. doi: 10.4236/psych.2015.67088
- Anglim, J., Horwood, S., Smillie, L. D., Marrero, R. J., and Wood, J. K. (2020). Predicting psychological and subjective well-being from personality: a meta-analysis. *Psychol. Bull.* 146, 279–323. doi: 10.1037/bul0000226
- Armstrong, L., and Rimes, K. A. (2016). Mindfulness-based cognitive therapy for neuroticism (stress vulnerability): a pilot randomized study. *Behav. Ther.* 47, 287–298. doi: 10.1016/j.beth.2015.12.005
- Artino, A. R. (2012). Academic self-efficacy: from educational theory to instructional practice. *Perspect. Med. Educ.* 1, 76–85. doi: 10.1007/S40037-012-0012-5
- Baer, R. A., Smith, G. T., and Allen, K. B. (2004). Assessment of mindfulness by self-report: the Kentucky inventory of mindfulness skills. *Assessment* 11, 191–206. doi: 10.1177/1073191104268029
- Bajaj, B., Gupta, R., and Pande, N. (2016). Self-esteem mediates the relationship between mindfulness and well-being. *Person. Individ. Differ.* 94, 96–100. doi: 10.1016/j.paid.2016.01.020
- Balkis, M., and Duru, E. (2016). Procrastination, self-regulation failure, academic life satisfaction, and affective well-being: underregulation or misregulation form. *Eur. J. Psychol. Educ.* 31, 439–459. doi: 10.1007/s10212-015-0266-5
- Bamber, M. D., and Schneider, J. K. (2016). Mindfulness-based meditation to decrease stress and anxiety in college students: a narrative synthesis of the research. *Educ. Res. Rev.* 18, 1–32. doi: 10.1016/j.edurev.2015.12.004
- Bandura, A. (1977). Self-efficacy: toward a unifying theory of behavioral change. *Psychol. Rev.* 84, 191–215. doi: 10.1037/0033-295X.84.2.191
- Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory*. Englewood Cliffs, NJ: Prentice-Hall.
- Bandura, A. (1989). Human agency in social cognitive theory. *Am. Psychol.* 44, 1175–1184. doi: 10.1109/SCORED.2002.1033040
- Bandura, A. (1997). *Self-efficacy: The exercise of control*. New York: Freeman.
- Bandura, A., and Locke, E. (2003). Negative self-efficacy and goal effects revisited. *J. Appl. Psychol.* 88, 87–99. doi: 10.1037/0021-9010.88.1.87
- Baron, R. M., and Kenny, D. A. (1986). The moderator–mediator variable distinction in social psychological research: conceptual, strategic, and statistical considerations. *J. Pers. Soc. Psychol.* 51, 1173–1182. doi: 10.1037/0022-3514.51.6.1173
- Biswas-Diener, R., Diener, E., and Tamir, M. (2004). The psychology of subjective well-being. *Daedalus* 133, 18–25. doi: 10.1162/001152604323049352
- Black, D. S., Sussman, S., Johnson, C. A., and Milam, J. (2012). Psychometric assessment of the mindful attention awareness scale (MAAS) among Chinese adolescents. *Assessment* 19, 42–52. doi: 10.1177/1073191111415365
- Bouffard-Bouchard, T., Parent, S., and Larivee, S. (1991). Influence of self-efficacy on self-regulation and performance among junior and senior high-school age students. *Int. J. Behav. Dev.* 14, 153–164. doi: 10.1177/016502549101400203
- Boyce, B. E. (2011). *The mindfulness revolution: leading psychologists, scientists, artists, and meditation teachers on the power of mindfulness in daily life*. Boulder, Colorado: Shambhala Publications.
- Brown, K. W., and Ryan, R. M. (2003). The benefits of being present; mindfulness and its role in psychological well-being. *J. Pers. Soc. Psychol.* 84, 822–848. doi: 10.1037/0022-3514.84.4.822
- Carey, K. B., Neal, D. J., and Collins, S. E. (2004). A psychometric analysis of the self-regulation questionnaire. *Addict. Behav.* 29, 253–260. doi: 10.1016/j.addbeh.2003.08.001
- Carver, C. S., and Scheier, M. F. (1998). *On the self-regulation of behavior*. New York, NY: Cambridge University Press. 439.
- Casale, S., Lecchi, S., and Fioravanti, G. (2015). The association between psychological well-being and problematic use of internet communicative services among young people. *J. Psychol.* 149, 480–497. doi: 10.1080/00223980.2014.905432
- Chambers, R., Lo, B. C. Y., and Allen, N. B. (2008). The impact of intensive mindfulness training on attentional control, cognitive style, and affect. *Cogn. Ther. Res.* 32, 303–322. doi: 10.1007/s10608-007-9119-0
- Charoensukmongkol, P., and Puyod, J. V. (2022). Mindfulness and emotional exhaustion in call center agents in the Philippines: moderating roles of work and personal characteristics. *J. Gen. Psychol.* 149, 72–96. doi: 10.1080/00221309.2020.1800582
- Chen, C., Du, X., and Li, Y. (2019). Effect of mindfulness training on attention and academic emotion of students with learning disabilities. *J. School. Stud.* 16, 74–81. doi: 10.3969/j.issn.1005-2232.2019.02.009
- Chen, Y. H., and Lin, Y. J. (2018). Validation of the short self-regulation questionnaire for Taiwanese college students (TSSRQ). *Front. Psychol.* 9:259. doi: 10.3389/fpsyg.2018.00259
- Chiesa, A., and Serretti, A. (2009). Mindfulness-based stress reduction for stress management in healthy people: a review and meta-analysis. *J. Altern. Complement. Med.* 15, 593–600. doi: 10.1089/acm.2008.0495
- Choi, J., and Kim, S. (2016). Is the smartwatch an IT product or a fashion product? A study on factors affecting the intention to use smartwatches. *Comput. Hum. Behav.* 63, 777–786. doi: 10.1016/j.chb.2016.06.007
- Claro, A., and Perelmiter, T. (2022). The effects of mentoring programs on emotional well-being in youth: a meta-analysis. *Contemp. Sch. Psychol.* 26, 545–557. doi: 10.1007/s40688-021-00377-2
- Cobo-Rendón, R., Pérez-Villalobos, M. V., Páez-Rovira, D., and Gracia-Leiva, M. (2020). A longitudinal study: affective wellbeing, psychological wellbeing, self-efficacy and academic performance among first-year undergraduate students. *Scand. J. Psychol.* 61, 518–526. doi: 10.1111/sjop.12618
- Coffey, K. A., Hartman, M., and Fredrickson, B. L. (2010). Deconstructing mindfulness and constructing mental health: understanding mindfulness and its mechanisms of action. *Mindfulness* 1, 235–253. doi: 10.1007/s12671-010-0033-2
- Crane, R. (2017). *Mindfulness-based cognitive therapy: distinctive features*. New York: Routledge.

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- Diener, E. (2006). Guidelines for national indicators of subjective well-being and ill-being. *J. Happiness Stud.* 7, 397–404. doi: 10.1007/s10902-006-9000-y
- Dignath, C., Buettner, G., and Langfeldt, H. P. (2008). How can primary school students learn self-regulated learning strategies most effectively?: a meta-analysis on self-regulation training programmes. *Educ. Res. Rev.* 3, 101–129. doi: 10.1016/j.edurev.2008.02.003
- Dörnyei, Z. (2005). *The psychology of the language learner: individual differences in second language acquisition*, vol. 19. New York: Routledge, 42–68.
- Dörnyei, Z., and Ryan, S. (2015). *The psychology of the language learner revisited*. New York: Routledge.
- Duan, W. (2014). Disagreements of studies on mindfulness: conceptualization and measurements. *Adv. Psychol. Sci.* 22, 1616–1627. doi: 10.3724/SPJ.1042.2014.01616
- Elliot, A. (2005). “A conceptual history of the achievement goal construct” in *Handbook of competence and motivation*. eds. A. Elliot and C. Dweck (New York: The Guilford Press), 52–72.
- Etherton, K., Steele-Johnson, D., Salvano, K., and Kovacs, N. (2022). Resilience effects on student performance and well-being: the role of self-efficacy, self-set goals, and anxiety. *J. Gen. Psychol.* 149, 279–298. doi: 10.1080/00221309.2020.1835800
- Fathi, J., and Mohammaddokht, F. (2021). Foreign language enjoyment and anxiety as the correlates of the ideal L2 self in the English as a foreign language context. *Front. Psychol.* 12:790648. doi: 10.3389/fpsyg.2021.790648
- Fathi, J., Pawlak, M., Kruk, M., and Naderi, M. (2023). Modelling boredom in the EFL context: an investigation of the role of coping self-efficacy, mindfulness, and foreign language enjoyment. *Lang. Teach. Res.* 13621688231182176. doi: 10.1177/13621688231182176
- Feldmann, S. C., Martinez-Pons, M., and Shaham, D. (1995). The relationship of self-efficacy, self-regulation, and collaborative verbal behavior with grades: preliminary findings. *Psychol. Rep.* 77, 971–978. doi: 10.2466/pr0.1995.77.3.971
- Fomina, T., Burmistrova-Savenkova, A., and Morosanova, V. (2020). Self-regulation and psychological well-being in early adolescence: a two-wave longitudinal study. *Behav. Sci.* 10:67. doi: 10.3390/bs10030067
- Gagnon, M. C. J., Durand-Bush, N., and Young, B. W. (2016). Self-regulation capacity is linked to wellbeing and burnout in physicians and medical students: implications for nurturing self-help skills. *Int. J. Wellbeing* 6, 101–116. doi: 10.5502/ijw.v6i1.425
- Galla, B. M., Esposito, M. V., and Fiore, H. M. (2020). Mindfulness predicts academic diligence in the face of boredom. *Learn. Individ. Differ.* 81:101864. doi: 10.1016/j.lindif.2020.101864
- Galla, B. M., Wood, J. J., Tsukayama, E., Har, K., Chiu, A. W., and Langer, D. A. (2014). A longitudinal multilevel model analysis of the within-person and between-person effect of effortful engagement and academic self-efficacy on academic performance. *J. Sch. Psychol.* 52, 295–308. doi: 10.1016/j.jsp.2014.04.001
- Gao, J., and McLellan, R. (2018). Using Ryff’s scales of psychological well-being in adolescents in mainland China. *BMC Psychol.* 6, 17–18. doi: 10.1186/s40359-018-0231-6
- Goretzki, M., and Zysk, A. (2017). Using mindfulness techniques to improve student wellbeing and academic performance for university students: a pilot study. *JANZSSA* 25, 1–14.
- Hair, J. F., Anderson, R. E., Tatham, R. L., and Black, W. C. (1998). *Multivariate data analysis*. Upper Saddle River, NJ: Prentice Hall.
- Harackiewicz, J., Barron, K., Pintrich, P., Elliot, A., and Thrash, T. (2002). Revision of achievement goal theory: necessary and illuminating. *J. Educ. Psychol.* 94, 638–645. doi: 10.1037/0022-0663.94.3.638
- Hawe, E., Lightfoot, U., and Dixon, H. (2019). First-year students working with exemplars: promoting self-efficacy, self-monitoring and self-regulation. *J. Furth. High. Educ.* 43, 1–15. doi: 10.1080/0309877X.2017.1349894
- Hofer, J., Busch, H., and Kärtner, J. (2011). Self-regulation and well-being: the influence of identity and motives. *Eur. J. Personal.* 25, 211–224. doi: 10.1002/per.789
- Hoffman, C. (2010). Does mindfulness increase wellbeing? *J. Holist. Healthc.* 7:45.
- Hofmann, S. G., Sawyer, A. T., Witt, A. A., and Oh, D. (2010). The effect of mindfulness-based therapy on anxiety and depression: a meta-analytic review. *J. Consult. Clin. Psychol.* 78, 169–183. doi: 10.1037/a0018555
- Houben, M., Van Den Noortgate, W., and Kuppens, P. (2015). The relation between short-term emotion dynamics and psychological well-being: a meta-analysis. *Psychol. Bull.* 141, 901–930. doi: 10.1037/a0038822
- Hsieh, P. P. H., and Kang, H. S. (2010). Attribution and self-efficacy and their interrelationship in the Korean EFL context. *Lang. Learn.* 60, 606–627. doi: 10.1111/j.1467-9922.2010.00570.x
- Huang, C. (2013). Gender differences in academic self-efficacy: a meta-analysis. *Eur. J. Psychol. Educ.* 28, 1–35. doi: 10.1007/s10212-011-0097-y
- Huang, L. T., and Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Struc. Equ. Model. Multidiscipl. J.* 6, 1–55. doi: 10.1080/10705519909540118
- Jansen, R. S., Van Leeuwen, A., Janssen, J., Jak, S., and Kester, L. (2019). Self-regulated learning partially mediates the effect of self-regulated learning interventions on achievement in higher education: a meta-analysis. *Educ. Res. Rev.* 28:100292. doi: 10.1016/j.edurev.2019.100292
- Kabat-Zinn, J. (2003). Mindfulness-based interventions in context: past, present, and future. *Clin. Psychol. Sci. Pract.* 10, 144–156. doi: 10.1093/clipsy.bpg016
- Kafka, G. J., and Kozma, A. (2002). The construct validity of Ryff’s scales of psychological well-being (SPWB) and their relationship to measures of subjective well-being. *Soc. Indic. Res.* 57, 171–190. doi: 10.1023/A:1014451725204
- Kahneman, D. (1999). “Objective happiness” in *Well-Being: The Foundations of Hedonic Psychology*. eds. D. Kahneman, E. Diener and N. Schwarz (New York, NY: Sage), 1.
- Keyes, C. L. M. (1998). Social well-being. *Soc. Psychol. Quart.* 121–140. doi: 10.2307/2787065
- Keyes, C. L. (2002). The mental health continuum: from languishing to flourishing in life. *J. Health Soc. Behav.* 43, 207–222. doi: 10.2307/3090197
- Khouri, B., Sharma, M., Rush, S. E., and Fournier, C. (2015). Mindfulness-based stress reduction for healthy individuals: a meta-analysis. *J. Psychosom. Res.* 78, 519–528. doi: 10.1016/j.jpsychores.2015.03.009
- Kim, D. H., Wang, C., Ahn, H. S., and Bong, M. (2015). English language learners’ self-efficacy profiles and relationship with self-regulated learning strategies. *Learn. Individ. Differ.* 38, 136–142. doi: 10.1016/j.lindif.2015.01.016
- Kline, R. B. (2015). *Principles and practice of structural equation modeling 4th*. New York: Guilford Publications.
- Klussman, K., Curtin, N., Langer, J., and Nichols, A. L. (2020). Examining the effect of mindfulness on well-being: self-connection as a mediator. *J. Pac. Rim Psychol.* 14:e5. doi: 10.1017/prp.2019.29
- Lee, W., Lee, M. J., and Bong, M. (2014). Testing interest and self-efficacy as predictors of academic self-regulation and achievement. *Contemp. Educ. Psychol.* 39, 86–99. doi: 10.1016/j.cedpsych.2014.02.002
- Lei, X., Fathi, J., Noorbakhsh, S., and Rahimi, M. (2022). The impact of mobile-assisted language learning on English as a foreign language learners’ vocabulary learning attitudes and self-regulatory capacity. *Front. Psychol.* 13:872922. doi: 10.3389/fpsyg.2022.872922
- Leyland, A., Rowse, G., and Emerson, L. M. (2019). Experimental effects of mindfulness inductions on self-regulation: systematic review and meta-analysis. *Emotion* 19, 108–122. doi: 10.1037/emo0000425
- Li, W., and Bai, Y. (2018). How does perceived teacher support for second year junior students affect their academic achievement? Multiple mediating effects analysis based on academic self-efficacy and learning engagement. *Educ. Econ.* 6, 86–92.
- Liviñi, R., Gunnesch-Luca, G., and Iliescu, D. (2021). Research self-efficacy: a meta-analysis. *Educ. Psychol.* 56, 215–242. doi: 10.1080/00461520.2021.1886103
- Lomas, T., Medina, J. C., Ivztan, I., Rupprecht, S., Hart, R., and Eiroa-Orosa, F. J. (2017). The impact of mindfulness on well-being and performance in the workplace: an inclusive systematic review of the empirical literature. *Eur. J. Work Organ. Psy.* 26, 492–513. doi: 10.1080/1359432X.2017.1308924
- Lundwall, C., Fairborn, S., Quinones-Camacho, L., Estep, J., and Davis, E. (2019). Self-regulation mechanisms explain how dispositional mindfulness promotes well-being. *J. Posit. Psychol. Wellbeing* 3, 153–164.
- Mascia, M. L., Agus, M., Cabras, C., Bellini, D., Renati, R., and Penna, M. P. (2023). Present and future undergraduate students’ well-being: role of time perspective, self-efficacy, self-regulation and intention to drop-out. *Educ. Sci.* 13:202. doi: 10.3390/educsci13020202
- Mascia, M. L., Agus, M., and Penna, M. P. (2020). Emotional intelligence, self-regulation, smartphone addiction: which relationship with student well-being and quality of life? *Front. Psychol.* 11:375. doi: 10.3389/fpsyg.2020.00375
- Mills, N., Pajares, F., and Herron, C. (2006). A reevaluation of the role of anxiety: self-efficacy, anxiety, and their relation to reading and listening proficiency. *Foreign Lang. Ann.* 39, 276–295. doi: 10.1111/j.1944-9720.2006.tb02266.x
- Mo, X. (2012). Retrospect and prospect: domestic English learning self-efficacy research. *Guide Sci. Educ.* 2, 172–174.
- Mohammad Hosseini, H., Derakhshesh, A., Fathi, J., and Mehraein, L. (2023). Examining the relationships between mindfulness, grit, academic buoyancy and boredom among EFL learners. *Soc. Psychol. Edu.* 1–30. doi: 10.1007/s11218-023-09860-5
- Mutlu, A. K., Andarab, M. S., and Karacan, C. G. (2019). Self-efficacy and the use of compensatory strategies: a study on EFL learners. *Eur. J. Educ. Res.* 8, 249–255. doi: 10.12973/eu-jer.8.1.249
- Neff, K. D. (2003). Self-compassion: an alternative conceptualization of a healthy attitude toward oneself. *Self Identity* 2, 85–101. doi: 10.1080/15298860309032
- Ostafin, B. D., Robinson, M. D., and Meier, B. P. (Eds.). (2015). *Handbook of mindfulness and self-regulation* 47–63. New York: Springer
- Oxford, R. L. (1990). *Language learning strategies: What every teacher should know*. Rowley, MA: Newbury House.
- Paciello, M., Ghezzi, V., Tramontano, C., Barbaranelli, C., and Fida, R. (2016). Self-efficacy configurations and wellbeing in the academic context: a person-centred approach. *Personal. Individ. Differ.* 99, 16–21. doi: 10.1016/j.paid.2016.04.083

- Pan, Z., Wang, Y., and Derakhshan, A. (2023). Unpacking Chinese EFL students' academic engagement and psychological well-being: the roles of language teachers' affective scaffolding. *J. Psycholinguist. Res.* 52, 1799–1819. doi: 10.1007/s10936-023-09974-z
- Panadero, E., Jonsson, A., and Botella, J. (2017). Effects of self-assessment on self-regulated learning and self-efficacy: four meta-analyses. *Educ. Res. Rev.* 22, 74–98. doi: 10.1016/j.edurev.2017.08.004
- Peng, J. (2018). *A study on the relationship between English learning anxiety and the use of learning strategies in high school students*. Huaibei, China: Huaibei Normal University.
- Phan, H. P. (2016). Longitudinal examination of optimism, personal self-efficacy and student well-being: a path analysis. *Soc. Psychol. Educ.* 19, 403–426. doi: 10.1007/s11218-015-9328-4
- Piniel, K. (2013). L2 motivation, anxiety and self-efficacy: the interrelationship of individual variables in the secondary school context. *Stud. Second Lang. Learn. Teach.* 3, 523–550. doi: 10.14746/sslt.2013.3.4.5
- Pintrich, P. R., and De Groot, E. V. (1990). Motivational and self-regulated learning components of classroom academic performance. *J. Educ. Psychol.* 82, 33–40. doi: 10.1037/0022-0663.82.1.33
- Rahimi, M., and Fathi, J. (2022). Exploring the impact of wiki-mediated collaborative writing on EFL students' writing performance, writing self-regulation, and writing self-efficacy: a mixed methods study. *Comput. Assist. Lang. Learn.* 35, 2627–2674. doi: 10.1080/09588221.2021.1888753
- Ryan, R. M., and Deci, E. L. (2001). On happiness and human potentials: a review of research on hedonic and eudaimonic well-being. *Annu. Rev. Psychol.* 52, 141–166. doi: 10.1146/annurev.psych.52.1.141
- Ryff, C. D. (1989). Happiness is everything, or is it? Explorations on the meaning of psychological well-being. *J. Pers. Soc. Psychol.* 57, 1069–1081. doi: 10.1037/0022-3514.57.6.1069
- Ryff, C. D., and Keyes, C. L. M. (1995). The structure of psychological well-being revisited. *J. Person. Soc. Psychol.* 69, 719–727. doi: 10.1037/0022-3514.69.4.719
- Ryff, C. D., and Singer, B. H. (2008). Know thyself and become what you are: a eudaimonic approach to psychological well-being. *J. Happiness Stud.* 9, 13–39. doi: 10.1007/s10902-006-9019-0
- Schunk, D. H. (2001). "Social cognitive theory and self-regulated learning" in *Self-regulated learning and academic achievement: Theoretical perspectives*. eds. D. H. Schunk and B. J. Zimmerman (Hillsdale, NJ: Lawrence Erlbaum), 125–149.
- Schunk, D. H. (1994). "Self-regulation of self-efficacy and attributions in academic settings" in *Self-regulation of learning and performance: Issues and educational applications*. eds. D. H. Schunk and B. J. Zimmerman (New York: Routledge).
- Schunk, D. H., and Pajares, F. (2005). "Competence perceptions and academic functioning" in *Handbook of competence and motivation*. eds. A. J. Elliot and C. S. Dweck (New York: The Guilford Press), 85–104.
- Seligman, M. E. (2011). Flourish: a visionary new understanding of happiness and well-being. *Policy* 27, 60–61.
- Seligman, M. E. P., Rashid, T., and Parks, A. C. (2006). Positive psycho-therapy. *Am. Psychol.* 61, 774–788. doi: 10.1037/0003-066X.61.8.774
- Shapiro, S. L., Carlson, L. E., Astin, J. A., and Freedman, B. (2006). Mechanisms of mindfulness. *J. Clin. Psychol.* 62, 373–386. doi: 10.1002/jclp.20237
- Siddiqui, S. (2015). Impact of self-efficacy on psychological well-being among undergraduate students. *Int. J. Indian Psychol.* 2, 5–16. doi: 10.25215/0203.040
- Sitzmann, T., and Ely, K. (2011). A meta-analysis of self-regulated learning in work-related training and educational attainment: what we know and where we need to go. *Psychol. Bull.* 137, 421–442. doi: 10.1037/a0022777
- Stipek, D. (1988). *Motivation to learn: From theory to practice*. Englewood Cliffs, NJ: Prentice Hall.
- Tabachnick, B. G., and Fidell, L. S. (2007). *Using multivariate statistics*. Boston: Pearson.
- Tang, Y. Y., Holzel, B. K., and Posner, M. I. (2015). The neuroscience of mindfulness meditation. *Nat. Rev. Neurosci.* 16, 213–225. doi: 10.1038/nrn3916
- Teasdale, J. D., Segal, Z. V., Williams, J. M. G., Ridgeway, V. A., Soulsby, J., and Lau, M. (2000). Prevention of relapse/recurrence in major depression by mindfulness-based cognitive therapy. *J. Consult. Clin. Psychol.* 68, 615–623. doi: 10.1037/0022-006X.68.4.615
- Teng, L. S., and Zhang, L. J. (2016). A questionnaire-based validation of multidimensional models of self-regulated learning strategies. *Mod. Lang. J.* 100, 674–701. doi: 10.1111/modl.12339
- Theobald, M. (2021). Self-regulated learning training programs enhance university students' academic performance, self-regulated learning strategies, and motivation: a meta-analysis. *Contemp. Educ. Psychol.* 66:101976. doi: 10.1016/j.cedpsych.2021.101976
- Trautner, M., and Schwinger, M. (2020). Integrating the concepts self-efficacy and motivation regulation: how do self-efficacy beliefs for motivation regulation influence self-regulatory success? *Learn. Individ. Differ.* 80:101890. doi: 10.1016/j.lindif.2020.101890
- Wang, X. (2017). *A study on the correlation between English academic self-efficacy, academic emotion and academic achievement of junior middle school students*. Taiyuan, China: Shanxi Normal University.
- Wang, Y., and Zhao, X. (2015). Mediating effect of regulatory emotional self-efficacy between mindfulness and test anxiety. *Chin. J. Clin. Psych.* 23, 746–749. doi: 10.16128/j.cnki.1005-3611.2015.04.042
- Weiner, B. (2005). "Motivation from an attribution perspective and the social psychology of perceived competence" in *Handbook of competence and motivation*. eds. A. Elliot and C. Dweck (New York: The Guilford Press), 73–84.
- Wood, A. M., and Joseph, S. (2010). The absence of positive psychological (eudemonic) well-being as a risk factor for depression: a ten year cohort study. *J. Affect. Disord.* 122, 213–217. doi: 10.1016/j.jad.2009.06.032
- Xiyun, S., Fathi, J., Shirbagi, N., and Mohammaddokht, F. (2022). A structural model of teacher self-efficacy, emotion regulation, and psychological wellbeing among English teachers. *Front. Psychol.* 13:904151. doi: 10.3389/fpsyg.2022.904151
- Xue, J., Zhang, Y., and Huang, Y. (2019). A meta-analytic investigation of the impact of mindfulness-based interventions on ADHD symptoms. *Med.* 98, e15957. doi: 10.1097/MD.00000000000015957
- Yabukoshi, T. (2021). Self-regulation and self-efficacy for the improvement of listening proficiency outside the classroom. *Lang. Learn. J.* 49, 27–40. doi: 10.1080/09571736.2018.1472626
- Zeilhofer, L., and Sasao, Y. (2022). Mindful language learning: the effects of college students' mindfulness on short-term vocabulary retention. *System* 110:102909. doi: 10.1016/j.system.2022.102909
- Zhang, J. (2012). On the relationship of English learning adaptability, personality, academic self-efficacy, and academic performance of high school students. *J. Henan Institute Sci. Technol.* 4, 81–85.
- Zhang, L. J., Saeedian, A., and Fathi, J. (2022). Testing a model of growth mindset, ideal L2 self, boredom, and WTC in an EFL context. *J. Multiling. Multicult. Dev.* 1–16, 1–17. doi: 10.1080/01434632.2022.2062366
- Zhao, X. (2015). *Competition and compassion in Chinese secondary education*. New York: Palgrave Macmillan
- Zheng, C., Liang, J.-C., Li, M., and Tsai, C.-C. (2018). The relationship between English language learners' motivation and online self-regulation: a structural equation modelling approach. *System* 76, 144–157. doi: 10.1016/j.system.2018.05.003
- Zhu, X., and Li, J. (2019). Classroom culture in China: collective individualism learning model. *Springer Nature*
- Zimmerman, B. J. (2000). "Attaining self-regulation: a social-cognitive perspective" in *Self-regulation: Theory, research, and applications*. eds. M. Boekaerts, P. R. Pintrich and M. Zeidner (San Diego, CA: Academic Press).
- Zimmerman, B. J., and Kitsantas, A. (2014). Comparing students' self-discipline and self-regulation measures and their prediction of academic achievement. *Contemp. Educ. Psychol.* 39, 145–155. doi: 10.1016/j.cedpsych.2014.03.004
- Zimmerman, B. J., and Schunk, D. H. (Eds.) (2001). *Self-regulated learning and academic achievement: Theoretical perspectives*. New York: Routledge.
- Zollars, I., Poirier, T. I., and Pailden, J. (2019). Effects of mindfulness meditation on mindfulness, mental well-being, and perceived stress. *Curr. Pharmacy Teach. Learn.* 11, 1022–1028. doi: 10.1016/j.cptl.2019.06.005



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EDITED BY

María del Mar Molero Jurado,
University of Almería, Spain

REVIEWED BY

João Viseu,
University of Évora, Portugal
Man Jiang,
Dhurakij Pundit University, Thailand

*CORRESPONDENCE

Chengfu Yu
✉ yuchengfu@gzhu.edu.cn
Hongyu Zou
✉ zouhongyu2016@163.com

[†]These authors have contributed equally to this work

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The relationship between work–family conflict and job burnout among primary and secondary school teachers: the role of depression and cognitive reappraisal

Yue Li^{1†}, Xingcan Ni^{2†}, Wei Zhang³, Jianping Wang^{1,4}, Chengfu Yu^{2*} and Hongyu Zou^{3*}

¹College of Teacher Education, South China Normal University, Guangzhou, China, ²Department of Psychology, Research Center of Adolescent Psychology and Behavior, School of Education, Guangzhou University, Guangzhou, China, ³Center for Studies of Psychological Application, School of Psychology, South China Normal University, Guangzhou, China, ⁴Journal of South China Normal University, South China Normal University, Guangzhou, China

Background: Primary and secondary school teachers are a high-risk group for job burnout, and how to alleviate their job burnout has become an increasingly urgent issue. Previous studies have paid less attention to the differential effects of the bidirectional interaction between work and family on the job burnout of the teachers. This study aim to explore the different impact of work–family conflict and family–work conflict on job burnout among primary and secondary school teachers, as well as its underlying mechanisms.

Methods: This study selected 2,184 primary and secondary school teachers in China (Mage = 37.26; SD = 9.40) as participants using a random sampling method. Using the SPSS Process 4.0 macro plugin constructed a moderated mediation model, the study explored the relationships between two different forms of work–family conflict, depression, cognitive reappraisal, and job burnout.

Results: The study results indicated that both forms of work–family conflict were significantly positively related to the job burnout, and this relationship was influenced by the mediating role of depression. Furthermore, cognitive reappraisal moderated the relationship between depression and job burnout.

Conclusion: This study revealed the potential pathways influencing job burnout among primary and secondary school teachers in the Chinese cultural context. Focusing on and alleviating work–family conflicts for primary and secondary school teachers is crucial for mitigating their occupational burnout. Additionally, teachers should also carefully and reasonably use cognitive reappraisal as an emotional regulation strategy to adjust the impact of depression on occupational burnout.

KEYWORDS

work–family conflict, job burnout, depression, cognitive reappraisal, school teachers

1 Introduction

In recent years, job burnout has increasingly become a major concern for many people, and teachers' job burnout may jeopardize various aspects of themselves and their students (Maslach and Leiter, 2008; Madigan and Kim, 2021b). Job burnout refers to a state of depletion in individuals caused by excessive stress related to work in physiological, mental, emotional, and behavioral aspects (Fuming, 2003). It is a reaction to prolonged stress related to work, specifically characterized by emotional exhaustion, depersonalization, and diminished personal accomplishment (Maslach and Leiter, 2016). Job burnout has become a significant issue in the teaching profession. In a recent study, 43.26% of teachers self-reported experienced job burnout (Xue et al., 2023). Compared to other professions, primary and secondary school teachers are more prone to job burnout due to excessive workload and/or conflicted demands, as well as faced multiple pressures from parents, schools, and society (Iancu et al., 2018; Rasanen et al., 2022). Job burnout has a wide-ranging impact on teachers, damaging their interpersonal relationships, quality of life, teaching quality, job satisfaction, intention to leave, and physical and mental health. Furthermore (Capone et al., 2019; Garcia-Carmona et al., 2019; Madigan et al., 2023; Madigan and Kim, 2021a), it also affected students' academic performance, learning motivation, mental health, and social and behavioral issues (Madigan and Kim, 2021b). Therefore, it is necessary to delve deeper into the issue of Job burnout among primary and secondary school teachers.

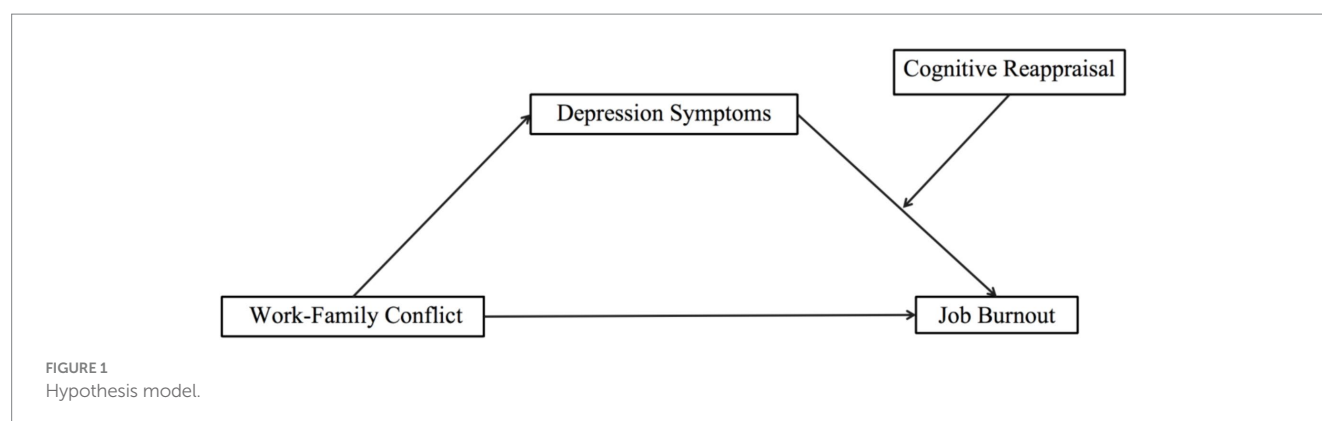
When exploring the causes of teacher Job burnout, we find that various factors such as work environment, professional skills, psychological capital, and sense of efficacy played important roles (Candeias et al., 2021; Capone et al., 2019; Pu et al., 2017). Among these, the relationship between teacher's work and family, especially work–family conflict, was a very significant aspect that is increasingly receiving attention from researchers. Work–family conflict was a form of role conflict triggered by role pressures at the work and family levels in terms of resources, emotional expressions, and behavior (Greenhaus and Beutell, 1985). It included work-to-family conflict (WFC) caused by job demands and family-to-work conflict (FWC) caused by family demands (Frone et al., 1997a). According to the conservation of resources theory (Grandey and Cropanzano, 1999), individuals had limited resources in both work and family domains. When individuals expended too many resources in one domain that they are unable to invest enough resources in the other, work–family conflict arises. Prolonged conflict led to a sense of resource depletion, prompted individuals to reduce resource investment at work to conserve existing resources, thus led to job burnout (Hobfoll, 2002). Numerous empirical studies also highlighted the significant impact of work–family conflict on teacher job burnout (Junca-Silva and Freire, 2022; Pu et al., 2017; Shang, 2022). Family and work were indispensable parts of primary and secondary school teachers' lives, and a dynamic balance should be achieved (Brosch and Binnewies, 2018). When they struggled to cope with the dual roles of work and family, work–family conflict became a major challenge, not only created additional stress but also exacerbating the tendency toward job burnout (Simaes et al., 2021; Lambert et al., 2022).

However, most of the past research on work–family conflicts has overlooked the interactions between work and family, focused more on single dimensions or overall conflict. There was still a lack of understanding of the differential effects of WFC and FWC and their

underlying mechanisms (Li et al., 2021). In fact, work and family are mutually influential, so WFC and FWC may have different impacts on primary and secondary school teachers. We should fully understood the work–family conflict from a bidirectional perspective (Tone Innstrand et al., 2008), explored the different effects of the two types of work–family conflicts on job burnout and their potential mechanisms to provide targeted recommendations for alleviating job burnout among primary and secondary school teachers and improving educational quality. Based on the above considerations, we focused on primary and secondary school teachers as our research subjects, studying the impact of the two dimensions of work–family conflict – WFC and FWC on their job burnout. We hypothesized that different forms of work–family conflict are significantly positively correlated with job burnout among primary and secondary school teachers, and there may be differences in their potential mechanisms.

It is worth noting that, even under the same working conditions and family demands, not all individuals will experience the same level of job burnout (Simaes et al., 2021). Therefore, understood the individual factors influencing job burnout and the role these factors may play in the interplay between work–family conflict and job burnout is crucial (Pu et al., 2017). Depression symptoms, as a typical negative emotional state, were prevalent in various aspects of life, manifested by symptoms such as sleep disturbances, fatigue, lack of concentration, loss of appetite, and lack of interest in daily experiences (American Psychiatric Association, 2013), led to impaired interpersonal relationships, social, and occupational functioning (Ibrahim et al., 2013). Despite the close association between job burnout and depression symptoms, some past studies have regarded them as overlapping concepts (Bianchi et al., 2021); however, a recent network analysis indicated they have distinct structures (Wang et al., 2024). According to the affective events theory (Weiss and Cropanzano, 1996), experienced negative work events triggers individual emotional responses, further influencing attitudes and behaviors. Therefore, when individuals face frequent work–family conflicts (a form of negative work event), they may experienced intense negative emotions (Zhou et al., 2018). If these emotions persisted and gradually infiltrated into work, individuals may experienced the same negative emotions in their work, reduced work enthusiasm and motivation, ultimately led to job burnout. Consistent with this viewpoint, empirical evidence indicated a positive correlation between work–family conflict and depression, with individuals experienced severe work–family conflict showed high levels of depression (Peter et al., 2016; Wang and Peng, 2017; Zeng and Guo, 2024; Zhang et al., 2023). Furthermore, depression can lead to a reduction in the psychological resources available to individuals at work, made it difficult to cope with job demands, thereby increased job burnout (Hatch et al., 2019; Zeng and Guo, 2024). Based on the theory and empirical evidence, this study assumed that depression can significantly mediate the relationship between two types of work–family conflict and job burnout among primary and secondary school teachers.

The stress-buffering model (Cohen and Wills, 1985) suggested that protective factors can weaken the impact of risk factors. According to this theory, not all individuals affected by work–family conflict will experienced negative emotional states, such as job burnout (Simaes et al., 2021). Teachers in primary and secondary schools can use cognitive resources to help them cope with these challenges (Weiss and Cropanzano, 1996). Cognitive reappraisal was an adaptable emotional regulation strategy where individuals change



their understanding of emotional events and the personal significance of these events to regulate emotions (McRae et al., 2012). Previous studies have highlighted the numerous benefits of cognitive reappraisal in the workplace; it can reduce negative emotions, increase job satisfaction, and prevent burnout (Feinberg et al., 2020; Shapero et al., 2019). Therefore, teachers who use cognitive reappraisal to minimize or avoid negative emotional experiences may be less affected by these emotions, thus reducing burnout. Given that cognitive reappraisal was primarily flexible and effective in reducing negative emotions such as depression and led to more positive emotional outcomes (Gross, 2014), this study focused on the impact of cognitive reappraisal on depression, assuming that cognitive reappraisal can significantly moderated the relationship between depression and job burnout.

In summary, this study will, for the first time in a Chinese context, explore the relationship between two different forms of work–family conflict and job burnout among primary and secondary school teachers based on the affective events theory and the stress-buffering model. It will also examine the roles of depression and cognitive reappraisal in this relationship. The findings of the study will have significant theoretical and practical implications for understanding and uncovering the mechanisms behind occupational burnout among primary and secondary school teachers (Figure 1).

Based on the literature review, this study proposes the following hypothesis:

H1: Both forms of work–family conflict are significantly positively correlated with job burnout among primary and secondary school teachers.

H2: Depression can significantly mediated the relationship between two different forms of work–family conflict and job burnout.

H3: Cognitive reappraisal can significantly moderated the relationship between depression and job burnout.

2 Methods

2.1 Participants and procedure

This study utilized a random sampling method to gather data through 2,514 online questionnaires distributed in April 2023 across

Guangdong Province in South China, using the Wenjuanxing platform.¹ All participants were primary and secondary school teachers who could fill out the questionnaire by scanning a QR code or clicking on a link. After excluding incomplete responses, surveys completed in less than 210 s, and questionnaires with abnormal ages, a total of 2,184 valid questionnaires were collected (505 males, 23.12%). The effective response rate was 86.87%. The average age of the participants was 37.26 years with a standard deviation of 9.40, ranging from 18 to 61 years.

Among the valid respondents, 2,056 held undergraduate degrees, 210 possessed postgraduate degrees, and 248 had associate degrees. Notably, 1,805 teachers (71.80%) were employed in public schools. Participation in this study was entirely voluntary, allowing participants the freedom to opt in or out as they chose. Before taking part, all individuals signed a written informed consent form online. This study was approved by the Ethics Committee of the School of Education, Guangzhou University.

2.2 Measurements

2.2.1 Work-to-family conflict and family-to-work conflict

Work–family conflict and family–work conflict were assessed using the work–family conflict questionnaire developed by Carlson et al. (2000). The questionnaire was adapted into Chinese by Lu et al. (2009) and consists of 12 items such as “I have to sacrifice time with my family to complete necessary work tasks.” Responses were rated on a Likert scale from 1 = strongly disagree to 5 = strongly agree across two dimensions—work–family conflict and family–work conflict. A higher total score indicated a higher level of conflict. In this study, the questionnaire demonstrated good reliability with a Cronbach’s α coefficient of 0.89.

2.2.2 Depression symptoms

Depressive symptoms were assessed using the PHQ-9 scale developed by Kroenke et al. (2001) and introduced into Chinese by Wang et al. (2014). This scale measures the presence and severity of depressive symptoms with 9 items (e.g., feeling down, depressed, or hopeless). Responses were scored on a 4-point Likert scale ranging from 0 (not at all) to 3 (nearly every day), with a total score ranging

¹ www.wjx

from 0 to 27. A higher score indicated more severe depressive symptoms. The questionnaire demonstrated good internal consistency with a Cronbach's α coefficient of 0.92.

2.2.3 Job burnout

Job burnout among primary and secondary school teachers was assessed using the Job Burnout Questionnaire developed by Fuming (2003). The Likert-type scale ranged from 1 = strongly disagree to 5 = strongly agree, comprising 15 items such as "I feel overburdened at work." The total score indicated the level of occupational burnout among teachers, with higher scores reflecting higher levels. In this study, the Cronbach's α coefficient was 0.71.

2.2.4 Cognitive reappraisal

Cognitive Reappraisal was measured using the Cognitive Reappraisal dimension questionnaire from the Emotion Regulation Questionnaire developed by Gullone and Taffe (2012) and translated into Chinese by Liu et al. (2017). The scale consisted of 10 items, with the Cognitive Reappraisal dimension comprising 6 items (e.g., "When I want to feel happier, I think about something different"), specifically items 1, 3, 5, 7, 8, and 10. Responses were rated on a Likert scale from 1 for "completely disagree" to 5 for "completely agree," with higher scores indicating greater use of cognitive reappraisal strategies. The questionnaire demonstrated a high internal consistency with a Cronbach's α coefficient of 0.94 in this study.

2.3 Statistical analysis

Data organization and preliminary analysis were performed using IBM SPSS 26.0. Common method bias was assessed through Harman's single-factor test. Factor analysis was used to test the covariance for data. Then, the Shapiro–Wilk test was used to test the normality of each continuous key variable. Variables were subjected to, descriptive statistics, with normal data described by mean plus or minus standard deviation. Spearman correlation analysis was also performed to explore the correlation between the main variables.

The Moderated mediation model was established using the Process 4.0 macro plugin in SPSS. Hypotheses 1 and 2 were tested using the mediating model (Model 4), while hypothesis 3 was tested using the moderated mediation model (Model 14). Both models controlled for gender and age effects. When examining the model of work–family conflict on job burnout, family–work conflict was controlled; and when examining the model of family–work conflict on job burnout, work–family conflict was controlled. The independent, dependent, and mediating variables were consistent in both models, involving two forms of work–family conflict, occupational burnout, and depression. Cognitive reappraisal was introduced as a moderating variable in the moderated mediation model.

3 Results

3.1 Common methods bias

This study collected data through self-report, which may lead to common method bias issues affecting the research results. Therefore, it was necessary to examine the presence of common method bias.

Harman single-factor analysis was employed for detecting common method bias (Podsakoff et al., 2003). The results indicated seven factors with eigenvalues greater than 1, and the largest factor explained a variance of 30.87%, below the critical value of 40%. Hence, it can be inferred that this study did not have significant common method bias issues.

3.2 Collinearity test

Simultaneously, the process plug-in creates a mediating/moderating effect model using linear regression principles, resulting in a notable correlation among different variables in this process. Therefore, conducting a collinearity test holds great significance. The variance inflation factor (VIF) for all predictive variables (ranging from 1.080 to 1.505) was found to be less than 3. Additionally, the tolerance values (ranging from 0.657 to 0.926) were greater than 0.1. These results indicate that there is no significant issue of multicollinearity in the data, as reported by Dormann et al. (2013).

3.3 Descriptive analysis and correlation test of core variables

Descriptive statistics and correlation analysis revealed that work–family conflict was significantly positively related with family–work conflict, depression, and job burnout. The family–work conflict was positively related with depression and job burnout. Depression was positively correlated with job burnout. Additionally, cognitive reappraisal showed significant negative correlations with work–family conflict, family–work conflict, depression, and job burnout (Table 1).

3.4 Tests of mediating effects of depression

3.4.1 Test of the mediate effect of depression on the relationship between work-to-family conflict and job burnout

Using model 4 from the SPSS PROCESS plugin, after controlling for gender, age, and family–work conflict, it was found that work–family conflict significantly predicted depression ($\beta = 0.265$, $SE = 0.022$, $p < 0.001$) and Job Burnout ($\beta = 0.177$, $SE = 0.019$, $p < 0.001$). Depression significantly predicted teacher job burnout ($\beta = 0.439$, $SE = 0.018$, $p < 0.001$). Further analysis using the bias-corrected Bootstrap method ($n = 5,000$) revealed a significant mediating effect of depression with a value of 0.116, $SE = 0.012$, 95% CI [0.093, 0.139]. Therefore, depression significantly mediated the relationship between work–family conflict and teacher job burnout (Table 2).

3.4.2 Test of the mediate effect of depression on the relationship between family-to-work conflict and job burnout

After controlling for gender, age, and work–family conflict, it was observed that family–work conflict was significantly related to depression ($\beta = 0.289$, $SE = 0.022$, $p < 0.001$) and job burnout ($\beta = 0.208$, $SE = 0.019$, $p < 0.001$). Depression also significantly predicted teacher job burnout ($\beta = 0.439$, $SE = 0.018$, $p < 0.001$). The analysis using the bias-corrected Bootstrap method ($n = 5,000$) showed a significant

TABLE 1 Mean, standard deviation and correlation coefficients of the variables.

Variable	M ± SD	1	2	3	4	5	6	7
Gender	1.77 ± 0.42	—						
Age	37.26 ± 9.40	−0.281***	—					
Work–family conflict	3.48 ± 0.91	−0.004	−0.011	—				
Family–work conflict	2.68 ± 0.91	−0.060**	−0.025	0.497***	—			
Depression	1.84 ± 0.62	0.041	−0.115***	0.431***	0.439***	—		
Job burnout	2.86 ± 0.46	0.025	−0.160***	0.475***	0.478***	0.611***	—	
Cognitive reappraisal	5.59 ± 1.05	−0.008	0.075***	−0.073**	−0.178***	−0.325***	−0.189***	—

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

TABLE 2 Test of the mediate effect of depression.

		β	SE	t	95% CI	R^2	F
Equation 1: Depression	Work–family conflict	0.265	0.022	11.978***	[0.222, 0.308]	0.245	176.801***
	Gender	0.049	0.046	1.046	[−0.042, 0.139]		
	Age	−0.009	0.002	−4.140***	[−0.013, −0.005]		
	Family–work conflict	0.289	0.022	13.012***	[0.245, 0.332]		
Equation 2: Job Burnout	Work–family conflict	0.177	0.019	9.226***	[0.139, 0.215]	0.467	381.811***
	Depression	0.439	0.018	24.399***	[0.404, 0.475]		
	Gender	−0.044	0.039	−1.119	[−0.120, 0.033]		
	Age	−0.009	0.002	−5.243***	[−0.013, −0.006]		
	Family–work conflict	0.208	0.019	10.718***	[0.170, 0.245]		

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

mediating effect of depression with a value of 0.127, $SE = 0.014$, 95% CI [0.101, 0.155]. Thus, depression significantly mediated the relationship between family–work conflict and teacher job burnout. Details are shown in Figure 2 and Table 3.

3.5 Test of the moderate effect of cognitive reappraisal on the relationship between two different conflicts and job burnout

Using model 14 in the SPSS PROCESS plugin, a moderated mediation analysis was conducted. After controlling for gender, age, and family–work conflict, the results in Table 4 indicated a significant interaction effect where depression and cognitive reappraisal predict job burnout ($\beta = 0.055$, $SE = 0.015$, $p < 0.001$). This suggests that cognitive reappraisal moderates the latter part of the mediation pathway “Work–family Conflict → Depression → Job Burnout.”

Similarly, employing model 14 in the SPSS PROCESS plugin, after controlling for gender, age, and work–family conflict, the analysis shown in Table 5 revealed another significant interaction effect where depression and cognitive reappraisal predict job burnout ($\beta = 0.005$, $SE = 0.015$, $p < 0.001$). This indicates that cognitive reappraisal moderates the latter part of the mediation pathway “Family–work Conflict → Depression → Job Burnout.”

To elucidate the substantial interactive effect of depression and cognitive reappraisal on job burnout, a simple slope test was further conducted. The effect value of depression on job burnout was calculated when cognitive reappraisal was one standard deviation

above and below the mean (Mean ± SD). A simple effect graph was then plotted using the values obtained by taking the mean plus and minus one standard deviation for both depression and cognitive reappraisal based on the regression equation. Interestingly, the study results indicate that in two different forms of work–family models with job burnout as the moderated mediator, the relationship between depression and job burnout is moderated by cognitive reappraisal and the values are consistent. As shown in Figure 3, in the moderated mediation model of work–family conflict and teacher job burnout, the positive association between depression and job burnout is significantly moderated by cognitive reappraisal ($\beta = 0.055$, 95% CI: [0.026, 0.084], $p < 0.001$). Simultaneously, in the moderated mediation model of family–work conflict and teacher job burnout, the positive association between depression and job burnout is also significantly moderated by cognitive reappraisal ($\beta = 0.055$, 95% CI: [0.026, 0.084], $p < 0.001$). With an increase in cognitive reappraisal level, the relationship between depression and job burnout is enhanced ($\beta = 0.398$, $t = 17.140$, $p < 0.001$) VS ($\beta = 0.530$, $t = 18.869$, $p < 0.001$).

4 Discussion

Based on the conservation of resources theory, the affective events theory, and the stress-buffering model (Cohen and Wills, 1985; Grandey and Cropanzano, 1999; Weiss and Cropanzano, 1996), a moderated mediation model was established to explore the relationship between different types of work–family conflict among

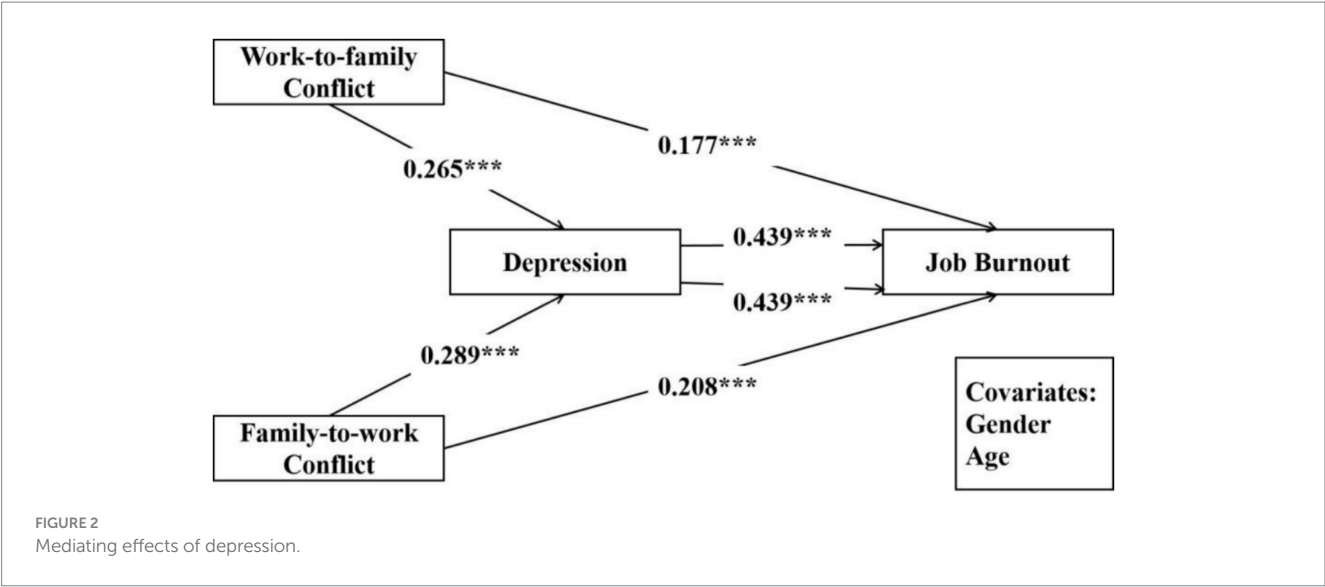


TABLE 3 Test of the mediate effect of depression.

		β	SE	t	95% CI	R^2	F
Equation1: Depression	Family-work conflict	0.289	0.022	13.012***	[0.245, 0.332]	0.245	176.801***
	Gender	0.049	0.046	1.046	[-0.042, 0.332]		
	Age	-0.009	0.002	-4.140***	[-0.013, -0.005]		
	Work-family conflict	0.265	0.022	11.978***	[0.222, 0.308]		
Equation2: Job burnout	Family-work conflict	0.208	0.019	10.718	[0.170, 0.245]	0.467	381.811***
	Depression	0.439	0.018	24.399	[0.404, 0.475]		
	Gender	-0.044	0.039	-1.119	[-0.120, 0.033]		
	Age	-0.009	0.002	-5.243	[-0.013, -0.006]		
	Work-family conflict	0.177	0.019	9.226	[0.139, 0.215]		

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

TABLE 4 The moderate effect of cognitive reappraisal on the relationship between work-to- family conflict and job burnout.

		β	SE	t	95% CI	R^2	F
Equation 1: depression	Work-family conflict (X)	0.265	0.022	11.978***	[0.222, 0.308]	0.245	176.801***
	Gender	0.049	0.046	1.046	[-0.042, 0.139]		
	Age	-0.009	0.002	-4.140***	[-0.013, -0.005]		
	Family-work conflict	0.289	0.022	13.012***	[0.245, 0.332]		
Equation 2: Job burnout	Work-family conflict (X)	0.173	0.019	9.023***	[0.135, 0.210]	0.472	278.112***
	Depression (M)	0.455	0.019	24.652***	[0.419, 0.492]		
	Cognitive (W)	0.043	0.016	2.674**	[0.012, 0.075]		
	M×W	0.055	0.015	3.745***	[0.026, 0.084]		
	Gender	-0.044	0.039	-1.121	[-0.120, 0.033]		
	Age	-0.009	0.002	-5.212***	[-0.013, -0.006]		
	Family-work conflict	0.205	0.019	10.582***	[0.167, 0.243]		

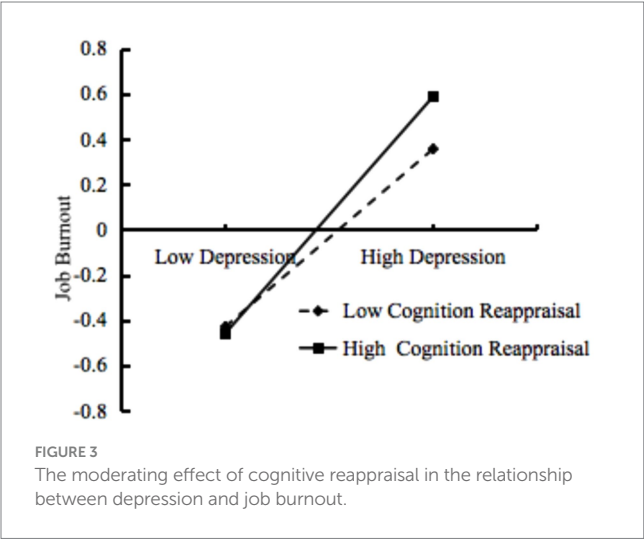
** $p < 0.01$, *** $p < 0.001$.

primary and secondary school teachers and job burnout, as well as the underlying mechanisms and whether there are differences between the two mechanisms. The results of the study indicate that both forms of work-family conflict are significantly positively related to job burnout among primary and secondary school teachers. Controlling for gender, age, and relative work-family conflict, both forms of work-family conflict can increase job burnout among primary and secondary school teachers by increasing levels of depression.

TABLE 5 The moderate effect of cognitive reappraisal on the relationship between family-to-work conflict and job burnout.

		β	SE	t	95% CI	R ²	F
Equation1: Depression	Family-work conflict (X)	0.289	0.022	13.012***	[0.245, 0.332]	0.245	176.801***
	Gender	0.049	0.046	1.046	[−0.042, 0.139]		
	Age	−0.009	0.002	−4.140***	[−0.013, −0.005]		
	Work-family conflict	0.265	0.022	11.978***	[0.222, 0.308]		
Equation2: Job burnout	Family-work conflict (X)	0.205	0.019	10.582***	[0.167, 0.243]	0.472	278.112***
	Depression (M)	0.455	0.019	24.652***	[0.419, 0.492]		
	Cognitive reappraisal (W)	0.043	0.016	2.674**	[0.012, 0.075]		
	M × W	0.055	0.015	3.745***	[0.026, 0.084]		
	Gender	−0.044	0.039	−1.121	[−0.120, 0.033]		
	Age	−0.009	0.002	−5.212***	[−0.013, −0.006]		
	Work-family conflict	0.173	0.019	9.023***	[0.135, 0.210]		

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



Additionally, cognitive reappraisal significantly moderates the relationship between depression and job burnout.

Firstly, the research results support H1, indicating that both forms of work-family conflict are significantly positively related to job burnout among primary and secondary school teachers. This is consistent with previous research findings (Junca-Silva and Freire, 2022; Pu et al., 2017; Shang, 2022), reaffirming that as work-family conflict intensifies, the risk of job burnout for individuals also increases accordingly. Specifically, both WFC and FWC have negative impacts on teachers' Job Burnout (Li et al., 2021). As emphasized by the conservation of resources theory (Grandey and Cropanzano, 1999), individuals have limited resources when coping with stress and challenges. When facing work-family conflict, individuals continuously need to allocate these limited resources to balance pressures from both work and family. If these consumed resources are not replenished in time, it can affect the individual's resource allocation at work, ultimately leading to the emergence of Job Burnout (Hobfoll, 2002; Zhao et al., 2022). Therefore, paying attention to and alleviating work-family conflict among primary and secondary school teachers is of vital importance in reducing their job burnout.

Secondly, this study found that depression partially mediated the relationship between two different forms of work-family conflict and job burnout among primary and secondary school teachers, supporting H2. Prior research has indicated that depression is independently associated with both work-family conflict and job burnout (Peter et al., 2016; Wang and Peng, 2017; Zeng and Guo, 2024; Zhang et al., 2023). This study extends previous research by revealing the developmental path from work-family conflict to depression to job burnout among primary and secondary school teachers. These results suggest that experiencing two different forms of work-family conflict significantly impairs the psychological health of primary and secondary school teachers, increases their risk of depression, and thereby promotes the occurrence of job burnout. According to the affective events theory (Weiss and Cropanzano, 1996), work-family conflict as a negative work event triggers intense negative emotional experiences in individuals, such as depression (Zhou et al., 2018). Prolonged states of depression continuously deplete individuals' limited psychological and emotional resources, leading to a decrease in their job satisfaction and enthusiasm, thereby triggering job burnout (Hatch et al., 2019; Zeng and Guo, 2024). Although a four-year longitudinal study found that family-work conflict is related to more symptoms of depression, while work-family conflict is unrelated to depression symptoms (Frone et al., 1997b), our study and some other studies indicate that the impact of the two different forms of work-family conflict on mental health is similar, both exacerbating depression symptoms (Hao et al., 2015; Zhou et al., 2020). This inconsistency reflects that the relative importance of work and family in individuals' lives may dynamically change over time, cultures, and social contexts (Zhou et al., 2020).

Finally, this study revealed that cognitive reappraisal plays an important moderating role in the relationship between depression and job burnout, regardless of the influence in the WFC or FWC context, supporting H3. Specifically, when the level of depression is low, teachers with low cognitive reappraisal show higher levels of job burnout compared to those with high cognitive reappraisal; conversely, when depression levels are relatively high, the situation is reversed. This is inconsistent with the stress-buffering model (Cohen and Wills, 1985) and most previous studies (Feinberg et al., 2020; Shapero et al., 2019), but confirms researchers' growing concern that Cognitive

Reappraisal may be a double-edged sword, also having adverse effects (Feinberg et al., 2020; Troy et al., 2013). At lower levels of depression, cognitive reappraisal helps teachers maintain a positive attitude (Gross, 2014), effectively alleviating the negative impact of job burnout. However, at relatively higher levels of depression, overreliance or improper use of cognitive reappraisal may lead teachers to overlook the root of the problem, weaken the guiding and promoting role of negative emotions on appropriate social behavior (Forgas, 2013; Ketelaar and Tung, 2003), thereby reducing their motivation to take practical action to solve problems (Feinberg et al., 2020), exacerbating job burnout. Therefore, in coping with work–family conflict and depression, teachers need to carefully and flexibly choose emotional regulation strategies.

Although this study has theoretical and practical value in reducing job burnout among primary and secondary school teachers, we must acknowledge its limitations. Firstly, the study mainly relied on self-reported data collection methods, which may have certain methodological biases. To minimize this issue, we conducted statistical tests on methodological biases and found their impact to be insignificant. Future research could explore more diverse research methods, such as momentary ecological studies, to objectively investigate the relationship between work–family conflict and job burnout among primary and secondary school teachers. Secondly, due to the cross-sectional design of this study, we cannot draw strong causal conclusions and lack an in-depth understanding of the long-term dynamic relationships between different forms of work–family conflict, depression, and job burnout. Therefore, future research should employ longitudinal designs to examine causal and dynamic relationships between variables by tracking and collecting data at multiple time points.

Thirdly, the differences in teaching levels and the age stages of the students between middle school teachers and elementary school teachers may influence the research outcomes. Future studies could consider separately comparing these three distinct groups: junior high school teachers, senior high school teachers, and elementary school teachers, to further explore the differences in their models related to work–family conflict, depression, and job burnout. Such a nuanced analysis would provide a more comprehensive understanding of the mental health and influencing factors among teachers at different educational stages. Lastly, this study focused on Chinese primary and secondary school teachers as the sample, and its conclusions may be influenced by the specific educational environment and cultural background of China. To verify the generalizability of these findings, future research should further expand the sample to include teacher populations from more countries and regions, and compare the impact mechanisms of work–family conflict on job burnout in different cultural contexts.

5 Conclusion

This study was the first to examine the factors influencing job burnout in primary and secondary school teachers in China by integrating two different forms of work–family conflict, depression, and cognitive reappraisal. These findings had an important theoretical and practical implications for understanding and revealing the mechanisms of job burnout in primary and secondary school teachers. Firstly, this study found a positive predictive effect of work–family conflict on job burnout in primary and secondary school teachers, emphasizing that interventions aimed at reducing work–family

conflict are conducive to promoting the psychological health and professional development of Chinese primary and secondary school teachers. Schools should create a positive work atmosphere for teachers, and strictly enforce work schedules to ensure teachers have enough rest time to maintain a good family and emotional life.

Besides, the mediating role of depression between work–family conflict and job burnout in primary and secondary school teachers suggests the need to establish a reliable psychological health screening mechanism for teachers, to regularly assess teachers' psychological health and job burnout levels at different stages, in order to identify the presence of psychological problems and job burnout issues at an early stage. Furthermore, research findings on the regulatory role of cognitive reappraisal between depression and job burnout indicate that in work and life, primary and secondary school teachers should use cognitive reappraisal as an emotion regulation strategy to adjust the impact of depression on job burnout.

Data availability statement

The datasets generated during and/or analysed during the current study are available from the corresponding author on reasonable request.

Ethics statement

The studies involving humans were approved by the Ethics Committee of the School of Education, Guangzhou 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

YL: Conceptualization, Writing – original draft. XN: Conceptualization, Writing – original draft. WZ: Data curation, Investigation, Writing – review & editing. JW: Writing – review & editing. CY: Data curation, Formal analysis, Investigation, Methodology, Writing – review & editing. HZ: Conceptualization, Supervision, 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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References

- American Psychiatric Association (2013). Diagnostic and statistical manual of mental disorders: dsm-5. Washington, D.C.: American Psychiatric Association.
- Bianchi, R., Verkuilen, J., Schonfeld, I. S., Hakanen, J. J., Jansson-Fröjmark, M., Manzano-García, G., et al. (2021). Is burnout a depressive condition? A 14-sample meta-analytic and bifactor analytic study. *Clin. Psychol. Sci.* 9, 579–597. doi: 10.1177/2167702620979597
- Brosch, E., and Binnewies, C. (2018). A diary study on predictors of the work-life interface: the role of time pressure, psychological climate and positive affective states. *Management Revue*, 29, 55–78.
- Candeias, A. A., Galindo, E., Calisto, I., Borralho, L., and Reschke, K. (2021). Stress and burnout in teaching. Study in an inclusive school workplace. *Health Psychol. Rep.* 9, 63–75. doi: 10.5114/hpr.2020.100786
- Capone, V., Joshanloo, M., and Park, M. S. (2019). Burnout, depression, efficacy beliefs, and work-related variables among school teachers. *Int. J. Educ. Res.* 95, 97–108. doi: 10.1016/j.ijer.2019.02.001
- Carlson, D. S., Kacmar, K. M., and Williams, L. J. (2000). Construction and initial validation of a multidimensional measure of work–family conflict. *J. Vocat. Behav.* 56, 249–276. doi: 10.1006/jvbe.1999.1713
- Cohen, S., and Wills, T. A. (1985). Stress, social support, and the buffering hypothesis. *Psychol. Bull.* 98, 310–357. doi: 10.1037/0033-2909.98.2.310
- Dormann, C. F., Elith, J., Bacher, S., Buchmann, C., Carl, G., Carré, G., et al. (2013). Collinearity: a review of methods to deal with it and a simulation study evaluating their performance. *Ecography*, 36, 27–46. doi: 10.1111/j.1600-0587.2012.07348.x
- Feinberg, M., Ford, B. Q., and Flynn, F. J. (2020). Rethinking reappraisal: the double-edged sword of regulating negative emotions in the workplace. *Organ. Behav. Hum. Decis. Process.* 161, 1–19. doi: 10.1016/j.obhdp.2020.03.005
- Forgas, J. P. (2013). Don't worry, be sad! On the cognitive, motivational, and interpersonal benefits of negative mood. *Curr. Dir. Psychol. Sci.* 22, 225–232. doi: 10.1177/0963721412474458
- Frone, M. R., Marcia, R., and Cooper, M. L. (1997a). Relation of work–family conflict to health outcomes: a four-year longitudinal study of employed parents. *J. Occup. Organ. Psychol.* 70, 325–335. doi: 10.1111/j.2044-8325.1997.tb00652.x
- Frone, M. R., Yardley, J. K., and Markel, K. S. (1997b). Developing and testing an integrative model of the work–family interface. *J. Vocat. Behav.* 50, 145–167. doi: 10.1006/jvbe.1996.1577
- Fuming, X. (2003). Current situation of job stress of primary and secondary school teachers and its relationship with job burnout. *Chin. J. Clin. Psych.* 3, 195–197.
- García-Carmona, M., Marin, M. D., and Aguayo, R. (2019). Burnout syndrome in secondary school teachers: a systematic review and meta-analysis. *Soc. Psychol. Educ.* 22, 189–208. doi: 10.1007/s11218-018-9471-9
- Grandey, A. A., and Cropanzano, R. (1999). The conservation of resources model applied to work–family conflict and strain. *J. Vocat. Behav.* 54, 350–370. doi: 10.1006/jvbe.1998.1666
- Greenhaus, J. H., and Beutell, N. J. (1985). Sources of conflict between work and family roles. *Acad. Manag. Rev.* 10, 76. doi: 10.2307/258214
- Gross, J. J. (2014). Emotion regulation: Conceptual and empirical foundations. *Handbook of emotion regulation*, 2, 3–20.
- Gullone, E., and Taffe, J. (2012). The emotion regulation questionnaire for children and adolescents (ERQ-CA): a psychometric evaluation. *Psychol. Assess.* 24, 409–417. doi: 10.1037/a0025777
- Hao, J., Di, W., Liu, L., Li, X., and Wu, H. (2015). Association between work–family conflict and depressive symptoms among chinese female nurses: the mediating and moderating role of psychological capital. *Int. J. Environ. Res. Public Health* 12, 6682–6699. doi: 10.3390/ijerph120606682
- Hatch, D. J., Potter, G. G., Martus, P., Rose, U., and Freude, G. (2019). Lagged versus concurrent changes between burnout and depression symptoms and unique contributions from job demands and job resources. *J. Occup. Health Psychol.* 24, 617–628. doi: 10.1037/ocp0000170
- Hobfoll, S. E. (2002). Social and psychological resources and adaptation. *Rev. Gen. Psychol.* 6, 307–324. doi: 10.1037/1089-2680.6.4.307
- Iancu, A. E., Rusu, A., Maroiu, C., Pacurar, R., and Maricutoiu, L. P. (2018). The effectiveness of interventions aimed at reducing teacher burnout: a meta-analysis. *Educ. Psychol. Rev.* 30, 373–396. doi: 10.1007/s10648-017-9420-8
- Ibrahim, A. K., Kelly, S. J., Adams, C. E., and Glazebrook, C. (2013). A systematic review of studies of depression prevalence in university students. *J. Psychiatr. Res.* 47, 391–400. doi: 10.1016/j.jpsychires.2012.11.015
- Junca-Silva, A., and Freire, M. (2022). The role of organizational climate, and work–family conflict in burnout: the case of teachers. *Sustain. For.* 14:13871. doi: 10.3390/su142113871
- Ketelaar, T., and Tung, A. W. (2003). The effects of feelings of guilt on the behaviour of uncooperative individuals in repeated social bargaining games: an affect-as-information interpretation of the role of emotion in social interaction. *Cogn. Emot.* 17, 429–453. doi: 10.1080/02699930143000662
- Kroenke, K., Spitzer, R. L., and Williams, J. B. (2001). The PHQ-9: validity of a brief depression severity measure. *J. Gen. Intern. Med.* 16, 606–613. doi: 10.1046/j.1525-1497.2001.016009606.x
- Lambert, E. G., Otu, S., Elechi, O. O., Jenkins, M., and Lanterman, J. L. (2022). Domain spillover and job stress: an exploratory study among nigerian prison staff. *Int. J. Comp. Appl. Crim. Justice* 46, 277–293. doi: 10.1080/01924036.2021.1907603
- Li, X., Lin, X., Zhang, F., and Tian, Y. (2021). Playing roles in work and family: effects of work/family conflicts on job and life satisfaction among junior high school teachers. *Front. Psychol.* 12:772025. doi: 10.3389/fpsyg.2021.772025
- Liu, W., Chen, L., and Tu, X. (2017). Chinese adaptation of emotion regulation questionnaire for children and adolescents (ERQ-CCA): a psychometric evaluation in Chinese children. *Int. J. Psychol.* 52, 398–405. doi: 10.1002/ijop.12233
- Lu, J. F., Siu, O. L., Spector, P. E., and Shi, K. (2009). Antecedents and outcomes of a fourfold taxonomy of work–family balance in Chinese employed parents. *J. Occup. Health Psychol.* 14, 182–192. doi: 10.1037/a0014115
- Madigan, D. J., and Kim, L. E. (2021a). Towards an understanding of teacher attrition: a meta-analysis of burnout, job satisfaction, and teachers' intentions to quit. *Teach. Teach. Educ.* 105:103425. doi: 10.1016/j.tate.2021.103425
- Madigan, D. J., and Kim, L. E. (2021b). Does teacher burnout affect students? A systematic review of its association with academic achievement and student-reported outcomes. *Int. J. Educ. Res.* 105:101714. doi: 10.1016/j.ijer.2020.101714
- Madigan, D. J., Kim, L. E., Glandorf, H. L., and Kavanagh, O. (2023). Teacher burnout and physical health: a systematic review. *Int. J. Educ. Res.* 119:102173. doi: 10.1016/j.ijer.2023.102173
- Maslach, C., and Leiter, M. P. (2008). Early predictors of job burnout and engagement. *J. Appl. Psychol.* 93, 498–512. doi: 10.1037/0021-9010.93.3.498
- Maslach, C., and Leiter, M. P. (2016). Understanding the burnout experience: recent research and its implications for psychiatry. *World Psychiatry* 15, 103–111. doi: 10.1002/wps.20311
- McRae, K., Jacobs, S. E., Ray, R. D., John, O. P., and Gross, J. J. (2012). Individual differences in reappraisal ability: links to reappraisal frequency, well-being, and cognitive control. *J. Res. Pers.* 46, 2–7. doi: 10.1016/j.jrp.2011.10.003
- Peter, R., March, S., and du Prel, J. B. (2016). Are status inconsistency, work stress and work–family conflict associated with depressive symptoms? Testing prospective evidence in the lida study. *Soc. Sci. Med.* 151, 100–109. doi: 10.1016/j.socscimed.2016.01.009
- Podsakoff, P. M., MacKenzie, S. B., Lee, J. Y., and Podsakoff, N. P. (2003). Common method biases in behavioral research: a critical review of the literature and recommended remedies. *J. Appl. Psychol.* 88, 879–903. doi: 10.1037/0021-9010.88.5.879
- Pu, J., Hou, H., Ma, R., and Sang, J. (2017). The effect of psychological capital between work–family conflict and job burnout in Chinese university teachers: testing for mediation and moderation. *J. Health Psychol.* 22, 1799–1807. doi: 10.1177/1359105316636950
- Rasanen, K., Pietarinen, J., Soini, T., Vaisanen, P., and Pyhalto, K. (2022). Experienced risk of burnout among teachers with persistent turnover intentions. *Teach. Dev.* 26, 317–337. doi: 10.1080/13664530.2022.2055629
- Shang, W. (2022). Job stress and burnout among ideological and political education teachers during the covid-19 pandemic: a moderated mediation model. *Front. Psychol.* 13:1008854. doi: 10.3389/fpsyg.2022.1008854
- Shapero, B. G., Stange, J. P., McArthur, B. A., Abramson, L. Y., and Alloy, L. B. (2019). Cognitive reappraisal attenuates the association between depressive symptoms and emotional response to stress during adolescence. *Cogn. Emot.* 33, 524–535. doi: 10.1080/02699931.2018.1462148
- Simaes, C., Rodrigues, J., Goncalves, A. M., Faria, S., and Gomes, A. R. (2021). Work–family conflicts, cognitive appraisal, and burnout: testing the mediation effect with structural equation modelling. *Br. J. Educ. Psychol.* 91, 1349–1368. doi: 10.1111/bjep.12420
- Tone Innstrand, S., Melbye Langballe, E., Arild Espnes, G., Falkum, E., and Gjerløw Aasland, O. (2008). Positive and negative work–family interaction and burnout: a

- longitudinal study of reciprocal relations. *Work Stress*. 22, 1–15. doi: 10.1080/02678370801975842
- Troy, A. S., Shallcross, A. J., and Mauss, I. B. (2013). A person-by-situation approach to emotion regulation: Cognitive reappraisal can either help or hurt, depending on the context. *Psychological science*, 24, 2505–2514. doi: 10.1177/0956797613496434
- Wang, W., Bian, Q., Zhao, Y., Li, X., Wang, W., Du, J., et al. (2014). Reliability and validity of the Chinese version of the patient health questionnaire (PHQ-9) in the general population. *Gen. Hosp. Psychiatry* 36, 539–544. doi: 10.1016/j.genhosppsych.2014.05.021
- Wang, Y., and Peng, J. (2017). Work - family conflict and depression in Chinese professional women: the mediating roles of job satisfaction and life satisfaction. *Int. J. Ment. Health Addict*. 15, 394–406. doi: 10.1007/s11469-017-9736-0
- Wang, X., Yang, M., Ren, L., Wang, Q., Liang, S., Li, Y., et al. (2024). Burnout and depression in college students. *Psychiatry Res*. 335:115828. doi: 10.1016/j.psychres.2024.115828
- Weiss, H.M., and Cropanzano, R. (1996). Affective events theory. *Research in organizational behavior*, 18, 1–74.
- Xue, D., Sun, B., Li, W., Zhou, H., Ding, F., and Xiao, W. (2023). The symptom network structure of teachers burnout and its connection to psychological capital. *Psychol. Res. Behav. Manag*. 16, 3503–3518. doi: 10.2147/PRBM.S421932
- Zeng, X., and Guo, H. (2024). The influence mechanism of prison police's depression: a cross-lagged analysis. *Crim. Justice Behav*. 51, 1204–1218. doi: 10.1177/00938548241240307
- Zhang, Y., Dugan, A. G., El Ghaziri, M., Siddique, S., and Punnett, L. (2023). Work-Family Conflict and Depression Among Healthcare Workers: The Role of Sleep and Decision Latitude. *Workplace health & safety*, 71, 195–205. doi: 10.1177/21650799221139998
- Zhao, W., Liao, X., Li, Q., Jiang, W., and Ding, W. (2022). The relationship between teacher job stress and burnout: a moderated mediation model. *Front. Psychol*. 12:784243. doi: 10.3389/fpsyg.2021.784243
- Zhou, S., Da, S., Guo, H., and Zhang, X. (2018). Work - family conflict and mental health among female employees: a sequential mediation model via negative affect and perceived stress. *Front. Psychol*. 9:544. doi: 10.3389/fpsyg.2018.00544
- Zhou, M., Zhang, J., Li, F., and Chen, C. (2020). Work-family conflict and depressive symptoms among chinese employees: cross-level interaction of organizational justice climate and family flexibility. *Int. J. Environ. Res. Public Health* 17:6954. doi: 10.3390/ijerph17196954



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EDITED BY

María del Mar Molero Jurado,
University of Almeria, Spain

REVIEWED BY

Khadijeh Aghaei,
Gonbad Kavous University, Iran
Eradah Hamad,
King Abdulaziz University, Saudi Arabia
Maria Magdalena Stan,
Pitesti University Centre, Romania

*CORRESPONDENCE

Yue Peng
✉ yue_peng@gzarts.edu.cn

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Enhancing cross-cultural well-being: a mixed methods study on critical thinking, cultural intelligence, and eudaimonic well-being in arts students' cultural identity development

Yue Peng*

School of Arts and Humanities, Guangzhou Academy of Fine Arts, Guangzhou, China

Introduction: This research explores the role of critical thinking and cultural intelligence in psychological well-being through the lens of cultural identity development. It aims to understand how individuals think critically and navigate different cultural challenges that influence their psychological wellbeing.

Methods: The quantitative analysis utilizes various scales to elucidate the correlation between critical thinking beliefs, cultural intelligence, and well-being. The qualitative exploration employing NVivo 20.0 uncovers the interplay between critical thinking, cultural intelligence, and well-being in the construction of cultural identity and psychological selfhood.

Results: The research results show a significant positive correlation between critical thinking, cultural intelligence, and psychological well-being. Themes such as well-being, cultural intelligence, critical thinking, and facing challenges illustrate how individuals navigate obstacles to achieve a meaningful and purposeful life. The findings from both the quantitative and qualitative analyses provide a comprehensive understanding of how critical thinking, cultural intelligence, and well-being intersect and influence individuals' perceptions of themselves and their cultural identities.

Discussion: The research results suggest that developing critical thinking and cultural intelligence positively impacts individuals' psychological well-being in cultural identity development. This can lead to greater belonging and acceptance in diverse cultural settings.

KEYWORDS

psychological well-being, critical thinking, cultural identity development, cultural intelligence, arts students

1 Introduction

Psychological well-being is a concept of overall life satisfaction. Ryff's (2014) multidimensional model is a significant framework for understanding psychological well-being. It focuses on the significant dimensions for achieving well-being, including self-acceptance, purpose in life, personal growth, positive relationships, autonomy, and environmental mastery. This perspective emphasizes pursuing a meaningful and fulfilling life, highlighting self-realization, personal growth, and the pursuit of virtue and excellence. Besides, Ryff (2023a) also proposed that cultures are significant for meaning-making while

achieving psychological well-being. According to Ryff (2023b), meaning-making is crucial at individual and societal levels. At the intrapersonal level, it is essential to acknowledge and process a wide range of emotions in comprehending social changes; at the interpersonal level, history, philosophy, and the arts play fundamental roles in developing the individual ability “to understand, to care, and to act.” Considering that, cultures play an important role in promoting awareness, perception, and comprehension of social context, providing insight into how life’s purpose should be constructed. From the perspective of psychological well-being, researchers might study various topics, such as sociodemographic factors, psychosocial influences, developmental changes over the lifespan, and differences in biological and health outcomes (Waterman, 2008). However, individuals’ subjective initiative significantly impacts their destinies, behaviors, and decisions throughout their lifespan. In today’s globalized world, individuals are often exposed to the influences of multiple cultures simultaneously, both externally and internally. Therefore, it is essential to employ a holistic approach when exploring cultures. Examining the cultural identity development process is a new perspective for understanding how individuals negotiate, adjust, and adapt to life challenges to achieve well-being. Accordingly, three research questions are addressed in this research:

RQ 1: How do critical thinking belief and cultural intelligence interact to impact individuals’ eudaimonic well-being?

RQ2: How do critical thinking, cultural intelligence, and psychological selfhood affect individuals’ well-being?

RQ3: How do critical thinking, cultural intelligence, and eudaimonic well-being contribute to the development of individuals’ cultural identities?

Well-being is deeply intertwined with personal feelings and interpretations of life experiences. This research, comprising quantitative and qualitative studies, highlights the universal aspects of well-being and brings attention to the culturally specific elements that influence how well-being is experienced, expressed, and constructed. The quantitative analysis will provide measurable insights into the relationships between critical thinking, cultural intelligence, and eudaimonic well-being. The qualitative analysis will focus on individual experiences and narratives navigating the challenges of identity development, which are not captured by psychological quantitative measurement. By exploring the complex ways in which critical thinking, cultural intelligence, and eudaimonic well-being contribute to personal growth, this study aims to offer a more comprehensive understanding of cultural identity development.

2 Literature review

2.1 Psychological well-being and cultural identity development

Psychological well-being is an expanded concept encompassing various elements, including—according to Ryff (1989, 2014)—self-acceptance, positive relationships with others, autonomy, environmental mastery, purpose in life, and personal growth. These

elements contribute to mental health, self-actualization, optimal functioning, and maturity by emphasizing the importance of positive attitudes toward oneself, warm relationships, independence, control over one’s environment, a sense of purpose, and continuous personal development. Overall, these dimensions provide a comprehensive fundamental framework for understanding and measuring psychological well-being that focuses on pursuing a meaningful and fulfilling life. As Ryff (2023a) states, psychological well-being should be accompanied by the ability to overcome challenges in real life. Some studies attempt to discover how an individual’s character impacts their happiness, life satisfaction, and emotional fulfillment. There are some researches focus on the relationship between various dimensions of subjective well-being in different age groups, contexts, and spaces between personalities (Albuquerque et al., 2012; Le Moglie et al., 2015; Stead and Bibby, 2017; Etxeberria et al., 2019; Gilberto et al., 2020; Barthelmäs and Keller, 2021; Fan et al., 2022; Kohút et al., 2022; Mussone and Changizi, 2023; Schneider et al., 2024). The others focus on the relationship with emotional intelligence (Schutte and Malouff, 2011; Bhullar et al., 2013; Vergara et al., 2015; Sánchez-Álvarez et al., 2016; Aloia and Brecht, 2017; Martínez-marín and Martínez, 2019; Alshakhsi et al., 2022; Martinez-Marin and Martínez, 2022; Mancini et al., 2024). However, the issues about exploring well-being from the cognitive and cultural perspective is rarely discussed. Thus, this research attempts to discover the interplay of these two aspects of psychological well-being.

Identity is multi-dimensional as it encompasses a combination of social and psychological attributes. Moran (2009) divided measurements of identity into personal (i.e., behaviors, emotions, beliefs, knowledge, and values) and social (i.e., racial, ethnic, and gender) dimensions. Most of these tools evaluate the degree to which an individual has achieved a particular level of identity along a particular dimension (e.g., ethnic identity). Identity development and formulation appear complicated. Some studies provide evidence that the construction of one’s identity is a continuous undertaking that transcends personal, social, and cultural boundaries, such as through various life stages (Marcia, 2002; Duerden et al., 2009; Pnevmatikos et al., 2010; Boskey, 2014; Green et al., 2016) and cultures (Germain, 2004; Walters and Auton-Cuff, 2009; Nguyen et al., 2012; Arneaud et al., 2016; du Plessis and Naudé, 2017; Renn, 2020). Cultural identity is a complex concept involving individual and social dimensions. Developing cultural identity is a multifaceted process involving various factors that shape an individual’s sense of self. Culture, philosophy, history, and the arts can activate awareness, prompt social change, and transform suffering into personal growth (Ryff 2023a). According to Mrazek et al. (2015), cultural differences in self-construal style shape individuals’ views of the self in both the mind and brain. Cultural beliefs significantly impact individuals’ self-awareness and self-evaluation (Mrazek et al., 2015). Furthermore, Gamsakhurdia (2019) states that the transition of identity in different cultures is “expected to result in the breaking of the initial opposition between A (native identity) and non-A (host identity) using a constructive mixture of opposites and the creation of a new higher-level sign.” Gamsakhurdia (2019, 2022) also proposes the term “proculturation,” which refers to a dynamic process that evolves in “three-dimensional temporal space—past< >present< >future.” This process typically refers to the cultural and identity integration that occurs when individuals or groups from different cultural backgrounds communicate. In line with these perspectives, psychological well-being across different

cultures can be comprehended as the ideal stage of cultural identity development.

In positive psychology, identity development involves overcoming conflicts that arise at different stages of life, influenced by societal factors and personal growth. The nature of identity is a person's unconscious sense of self, both as an individual and a member of the greater community (Schaetti, 2015). The personal growth aspect of psychological well-being was derived from Erikson's (1959) identity development theory, which emphasizes the importance of self-awareness and social roles in forming one's identity. As Erikson (1959) states, "identity formation can be said to have a self-aspect and an ego aspect." Self-identity arises from experiences in which a feeling of temporary self-dissolution is effectively managed through renewed and increasingly authentic self-definition and social acknowledgment (Erikson, 1959). Identity development is closely related to psychological well-being, which involves feeling comfortable with one's body, having a clear direction in life, and feeling confident about receiving recognition from significant others. However, an ideal sense of identity is neither achieved nor sustained. "Self-construction" and "self-discovery" are two ways to tackle identity development in the life span (Waterman, 1984, 2011). Self-construction refers to selecting valuable components from various options. Self-discovery is a journey of discovering the true self with better identity choices, which is "closely linked with eudaimonist philosophy (Waterman, 2011)." Waterman et al. (2010) propose the Questionnaire for Eudaimonic Well-Being (QEWB), which delves into personal growth, self-acceptance, autonomy, and purpose in life. The QEWB includes high internal consistency, with score distribution approximately normal. It was assessed among university students from diverse racial backgrounds at multiple locations in the United States, indicating that the instrument has broad application and is a reliable tool for assessing eudaimonic well-being in diverse contexts.

Furthermore, gaining insight into individual experiences leads to a sense of purpose, resilience, and fulfillment in identity development, ultimately contributing to a more balanced and fulfilling life. Eriksson and Frisén (2024) state that personal experiences positively or negatively affect psychological well-being. Their research showed that a positive narration of personal experiences positively impacted personal growth and improved life satisfaction. By contrast, negative narration causes more psychological distress, which has a negative effect on identity development (Eriksson, 148 McLean and Frisén, 2020). Other studies have indicated that personal narratives are an effective method for exploring psychological well-being (Vanaken et al., 2022; Syed and McLean, 2022), identity development (Castelló et al., 2023), and cross-cultural issues (Sharif and Channa, 2022; Stetz, 2023). These studies show that personal experiences, stories, and how an individual addresses them are closely related to cultural identity and well-being because individuals use personal narratives to shape their identity while being influenced by their identity in the stories they choose to tell. Besides, narrative theming is effective in exploring identity development. According to Saldaña (2016), narrative analysis is particularly suitable for inquiries into identity development and psychological, social, and cultural meanings and values. It organizes and presents the meaning or subject of data units and is an appropriate approach for psychological attributes such as "beliefs, constructs, identity development, and emotional experiences" (Saldaña, 2016). Therefore, integrating personal experiences through narrative analysis theming offers a powerful tool for understanding the complex

interplay between individual identity development and psychological well-being.

2.2 Psychological well-being and critical thinking

Psychological well-being is a diverse and multidimensional concept that has been researched and improved over the years. Ryff's (1989) renowned work interpreted psychological well-being from a more eudaimonic perspective. The eudaimonic approach is rooted in Aristotle's conception of happiness: Living well and doing well—living a virtuous life, pursuing noble actions, and enjoying appropriate happiness (Vittersø, 2016). The philosophical framework for exploring the complexities of "Happiness" might offer insights into understanding the eudaimonic approach to psychological well-being. Haybron (2000) stated that the comprehension of happiness cannot rely solely on conceptual analysis but must start from a basis that satisfies both theoretical and practical needs. He presents three concepts of happiness, providing a philosophical framework for further clarifying eudaimonic well-being: Psychological Happiness (subjective well-being and emotional satisfaction), Prudential Happiness (living a virtuous life), and Perfectionist Happiness (a moral and admirable life that is good in all respects). Consistent with Haybron's (2000) perspective, true well-being is closely related to Perfectionist Happiness. Haybron (2016) attempts to establish a logical foundation for incorporating various ultimate goods and provides three norms that should be embodied in well-being: admirability (perfection), actualization (capacity fulfillment), and success (goal fulfillment). Nonetheless, he claims that the Aristotelian theme of well-being struggles to balance the concepts of actualization and admirability in individuals' goal fulfillment. Moreover, Ford et al. (2015) showed that, to some extent, the motivation to pursue happiness can have negative consequences for well-being. This raises the question of how virtuous activity fits into well-being, while still prioritizing the idea of exercising our capacities.

Positive psychology offers a more holistic perspective on the factors contributing to an individual's well-being. It emphasizes positive experiences, personal characteristics, and supportive institutions that promote human flourishing and optimal performance. The eudaimonic literature is extensive, but three critical approaches are frequently referenced in the psychological field: Psychological Well-Being (Ryff, 1989; Ryff and Singer, 2008), Personal Expressiveness (Waterman, 1984, 1993), and Self-Determination Theory (Ryan and Deci, 2001). The eudaimonic approach in psychology suggests that true well-being, which is much more than happiness, lies in the "positive psychological functioning" (Ryff, 1989), the "feeling of personal expressiveness" (Waterman, 1993), and the "actualization of human potentials" (Ryan and Deci, 2001). Ryff (2014) proposed revised dimensions of psychological well-being, including autonomy, environmental mastery, personal growth, positive relationships with others, purpose in life, and self-acceptance. Furthermore, Ryff (2022, 2023a) advocates for linking the eudaimonic well-being research with challenges in life and offers further interpretations of the "embedding of the negative within the positive." Ryff (2023a, 2022, 2014) addressed the significance of certain individual qualities in dealing with real-life complexities, such as compassion, resilience, or adaptation. In line with that, one should engage in a self-fulfillment process involving

effortful and goal-directed thinking to achieve true well-being. René Descartes' philosophical statement, "Cogito, ergo sum" (which translates to, "I think, therefore I am"), highlights the importance of thinking for one's existence. Kahneman (2011) proposes the idea of two types of thinking: System 1 thinking ("operates automatically and quickly, with little or no effort and no sense of voluntary control") and System 2 thinking ("allocates attention to the effortful mental activities that demand it, including complex computations"). From this standpoint, hedonic well-being encompasses System 1 thinking, which is characterized by automaticity and effortlessness, while eudaimonic well-being embodies System 2 thinking, which is more mindful and effortful.

Critical thinking is System 2 thinking (Halpern 2014). It is a cognitive process that enables one to make reasoned judgments and decisions through analyzing, evaluating, and interpreting information. According to Halpern (2014), critical thinking "is used to describe thinking that is purposeful, reasoned, and goal-directed—the kind of thinking involved in solving problems, formulating inferences, calculating likelihoods, and making decisions when the thinker is using skills that are thoughtful and effective for the particular context and type of thinking task." Barnett (2021) suggests that critical thinking can be comprehended in mind, behavior, and being. Just like those interrelatedly connected staircases in the painting of M.C. Escher, these three parts are "interfused" and work together for new possibilities for decisions, new opportunities for beings, and new options for applying critical thinking skills (Barnett, 2021). In light of that, attaining the ideal self is only possible by intentionally practicing critical thinking. Thus, critical thinking could be comprehended as a more extensive concept like "criticality" or "critical being" (Barnett, 2021). Cultural identity development is a continuous self-exploration and maturation process requiring critical thinking. Critical thinking enables individuals to analyze and evaluate diverse viewpoints within a multicultural context, fostering inclusivity and respect. It is essential for constructing an authentic, inclusive, and informed cultural identity. According to Côté (2015), the understanding of critical thinking applied to identity studies reveals that identity development is often misunderstood and confused with identity maintenance. If identity development is a process of "purpose practice," as Moran (2009, 2020) suggested, cognitive growth should be considered. Cultural identity development requires intellectual breakthroughs by applying critical thinking, which entails challenging stereotypes, questioning societal norms, and actively seeking diverse perspectives.

Critical thinking and beliefs are intertwined intricately with deductive reasoning. Although a personal conviction may affect deductive reasoning, for it to be deemed accurate, it must conform to the principles of reasoning (Halpern, 2014). Dwyer (2017) also argued that "when deciding what to believe, we must avoid relying solely on justifications to accept our beliefs and refrain from merely seeking to affirm them, which results in a confirmation bias. This necessitates not only the determination of our own beliefs but also a critical examination of those beliefs." In the intercultural theories, Byram (2012, 2021) concept of critical cultural awareness in second language acquisition emphasizes developing critical skills and reflexivity, which means critically evaluating our and others' beliefs, values, and behaviors to comprehend cultural differences. Therefore, the connections between critical thinking and beliefs are supposed to impact the perception of cultures. Developed by Stupples et al. (2017)

to investigate attitudes and beliefs regarding critical thinking, CriTT demonstrates strong psychometric properties and validity, encompassing three psychological elements of critical thinking: confidence in critical thinking (CCT), Valuing Critical Thinking (VCT), and misconceptions of critical thinking (MCT) (Stupples et al., 2017). CCT and VCT serve as bridges, allowing effective communication and understanding across different cultural contexts, and MCT is an obstacle to becoming a critical thinker. These factors are closely related to the theoretical and practical aspects of critical thinking and can predict academic performance. Although the CriTT was developed within the context of psychology courses, its content and applications are not necessarily limited to that discipline. Stupples et al. (2017) removes all items directly referencing psychology, indicating that the CriTT tool can be applicable across various fields of study.

2.3 Psychological well-being and cultural intelligence

In today's cultural context, enhancing psychological well-being requires individuals to overcome many linguistic, cultural, and identity challenges. This requires individuals to navigate through various obstacles, such as language barriers, cultural differences, and the struggle to establish a sense of identity. Oxford (2018) proposed the EMPATHICS model of language learner well-being to address this issue. EMPATHICS modal comprises (E)motions (including pleasant and painful emotions) and empathy, (M)eaning and motivation, (P)erseverance (1 - hope, 2 - optimism, 3 - resilience), (A)gency and autonomy, (T)ime, (H)ardiness and habits of mind, (I)ntelligence, identity, investment, imagination, (C)haracter strengths, and (S)elf-components (self-efficacy, self-concept, self-esteem, self-regulation) (Oxford, 2018). This model illustrates how a language learner achieves well-being in an intercultural context. The intelligence components represent emotional intelligence, a personal characteristic crucial for enhancing overall well-being (Harzer, 2016). However, Ang et al. (2011) proposed that the emotional quotient (EQ) is contingent on culture, and cultural intelligence (CQ) is not limited to a particular culture; it encompasses a broad range of skills applicable to diverse cultural contexts. Asser and Langbein-Park (2015) also stated that the CQ combines the intelligence quotient (IQ), physical quotient (PQ), and EQ. Among these three, CQ shares much in common with EQ. Therefore, developing cultural intelligence is essential for individuals to successfully navigate the complexities of various cultures and improve their psychological well-being.

Cultural intelligence (CQ) is defined as "an individual's capability to function and manage effectively in culturally diverse settings (Ang et al., 2007)." Sternberg (1997) proposes that CQ is the ability to "grasp, reason, and behave" appropriately and sensibly in contexts of cultural differences. Sternberg et al. (2022) further clarify that the nature of cultural intelligence is "not something one can memorize, such as a vocabulary list or a set of facts. Rather, it is something that one deploys according to the intricacies of a situation and in light of the task and the persons involved." CQ consists of four factors: metacognitive, cognitive, motivational, and behavioral CQ. Metacognitive CQ refers to one's ability to learn and comprehend other cultures. Cognitive CQ is the knowledge of rules, traditions, and customs in various cultural contexts. Motivational CQ is the capacity to concentrate attention and energy toward acquiring and functioning cultural knowledge in intercultural

environments. Behavioral CQ is the competence to perform verbal and nonverbal actions appropriately in intercultural contexts (Ang et al., 2007). Becoming culturally intelligent means developing cultural adaptability to interact with cultures, people, and intercultural contexts (Asser and Langbein-Park, 2015). Regarding intercultural context, Asser and Langbein-Park (2015) states that the individual's CQ represents the improvement of "intercultural sensitivity, intercultural communication skills, the ability to build commitment and manage uncertainty."

Although CQ has a short history, its importance has been revealed in many disciplines. Fang et al.'s (2018) review of 142 articles on CQ reveals that it is an extensively researched concept that has increasingly caught the attention of psychology, education, and business. Over the past two decades, CQ research has primarily focused on two aspects: the application of CQ in different contexts and the connection between individual attributes and CQ. First, CQ has been studied in various educational and business contexts (Suthatorn and Charoensukmongkol, 2018; Wang, 2021; McKay et al., 2022; Daniel, 2022; Alexandra, 2022; Iskhakova et al., 2022; Dolce et al., 2023; Wolff et al., 2023; Skaria and Montayre, 2023). Second, researchers have investigated the relationship between CQ and a wide range of individual traits, such as anxiety level (Suthatorn and Charoensukmongkol, 2018; Bernardo and Presbitero, 2018), cognitive flexibility (Bernardo and Presbitero, 2018), intercultural competence (Li, 2020), foreign language skills (Presbitero, 2020), international experience (Ott and Iskhakova, 2019; McKay et al., 2022; Pidduck et al., 2022), and personality (Chédru and Ostapchuk, 2023). Moreover, the interconnection between CQ and EQ is also a frequently studied topic, which has been explored in various circumstances (Lin et al., 2012; Darvishmotevali et al., 2018; Lam et al., 2021; Cheung et al., 2022; Musarra et al., 2022; Davaei et al., 2022). Cultural intelligence should be considered an important element to enhance the psychological well-being between cultures. Pidduck et al.'s (2022) model presents the relationship between cross-cultural experience, cultural intelligence, and multicultural identity, but more evidence is needed for how CQ interacts with other components in cultural identity construction.

Various measurements are developed to assess cultural intelligence. Ang et al.'s (2007) Cultural Intelligence Scale (CQS) is the most popular measurement of cultural intelligence. The CQS contains 20 items and assesses four core dimensions of cultural intelligence: Metacognitive CQ, Cognitive CQ, Motivational CQ, and Behavioral CQ. Because CQS has been validated in two different cultural systems, the United States and Singapore, it has cross-validation and stability. However, Thomas et al. (2015) argues that the CQS has two problematic features. First, the CQS is incapable of addressing the relationship between each dimension. Second, the overall CQS construct needs to reveal how these four dimensions aggregate and interact. Compared with the CQS, the short-form measure of cultural intelligence (SFCQ) developed by Thomas et al. (2015) has fewer dimensions and items. This 10-item scale explores three significant cultural intelligence elements: metacognition, knowledge, and skills. Cultural metacognition is the central element of CQ and involves the mental processes of awareness, conscious analysis, and evaluation of the solution to a problem. Cultural knowledge refers to specific and processed knowledge related to recognizing cultural differences, comprehending intercultural encounters, and adapting to various cultures. Cultural skills are a series of abilities associated with acquiring knowledge through intercultural communication, connecting with people from other cultures, and adapting to various cultural situations (Thomas et al., 2015). SFCQ is related to emotional intelligence (EQ)

and personality traits but is distinct from them. It positively correlates with indicators of multicultural experience and the capacity to predict sociocultural adaptation, work performance in multicultural environments, and accurate interaction in cross-cultural interactions.

3 Methods

3.1 Research design

This research has two aims. The first is to explore how critical thinking beliefs and cultural intelligence interact to influence individuals' eudaimonic well-being. The second focuses on understanding how critical thinking, cultural intelligence, and eudaimonic well-being contribute to a sense of purpose and fulfillment in cultural and identity-related challenges. Two separate phases of the research were conducted at various times, and Study 1 was conducted one year before Study 2.

In the quantitative analysis in Studies 1 and 2, four questionnaires are applied: the Critical Thinking Toolkit (CriTT, Stuppel et al., 2017); Cultural Intelligence Scale (CQS, Ang et al., 2007); Short Form of Cultural Intelligence (SFCQ, Thomas et al., 2015); and Questionnaire for Eudaimonic Well-Being (QEWB; Waterman et al., 2010). The CriTT was adopted in the quantitative part of both Studies 1 and 2. Both the CQS and SFCQ were applied in this research to investigate how every dimension of cultural intelligence interacted with critical thinking belief. QEWB is applied to investigate the relationship between Eudaimonic Well-Being, critical thinking belief, and cultural intelligence. Study 1 involved the quantitative analysis using Questionnaire 1, which contained 27 CriTT items and 10 SFCQ items. In Study 2, Questionnaire 2 consisted of 68 items, including 27 from the CriTT, 20 from the CQS, and 21 from the QEWB. All questionnaires were rated on a 5-point Likert scale. The CriTT was administered to art students, providing evidence for its application across different disciplines and cultural contexts. The original QEWB shows a near-normal distribution of scores, and this study tries to investigate further how critical thinking beliefs and cultural intelligence affect the measurement of well-being. Correlation analyses using SPSS were conducted between the CQS, SFCQ, CriTT, and QEWB to investigate the connections between critical thinking, cultural intelligence, and eudaimonic well-being.

The second section of Study 2 involved a qualitative analysis of participants' narratives on well-being using NVivo 20.0. The narrative data were collected from a writing assignment that required students to reflect on their attitudes and thoughts about well-being. Based on Ryff's (1989, 2014) model, the assignment includes some questions to guide students in constructing their sense of well-being: 1. What is a happy life in your mind? 2. How do you think happiness in different cultures? 3. What is the most significant accomplishment in your life? 4. How can you contribute to the well-being of humans? Students were encouraged to answer open-ended questions freely, which were then included in the assignment, ensuring that data collection captured rich, objective information for qualitative analysis.

3.2 Samples

This research included 821 participants who were freshmen in an arts college. Informed consent was obtained from participants before

TABLE 1 The validation of Questionnaire 1.

	Cronbach's alpha	Cronbach's alpha based on standardized items	N of items
CriTT	0.887	0.905	27
CCT	0.949	0.951	17
VCT	0.804	0.817	6
MCT	0.686	0.687	4
SFCQ	0.931	0.931	10
Questionnaire 1	0.934	0.943	37

the study, and the ethical committee approved the study protocol. In Study 1, to explore the relationship between critical thinking beliefs and cultural intelligence, Questionnaire 1 was administered to 510 first-year students and analyzed using SPSS 20.0. Based on the findings of Study 1, Questionnaire 2 was administered to 311 first-year students to validate the results of Study 1. In the qualitative part of Study 2, participants were selected from among those who received the highest score on Questionnaire 2.

3.3 Research tools and data collection

3.3.1 Reliability and validation of Questionnaire 1

Questionnaire 1 comprises the CriTT and SFCQ, with 37 items divided into two parts. The first part has 27 items from the CriTT, among which 17 questions assess the level of Confidence in Critical Thinking (CCT), 6 for Valuing Critical Thinking (VCT), and 4 for Misconceptions of Critical Thinking (MCT, reverse scoring). The second part has 10 items from the SFCQ. Questions 1–2 concern cultural knowledge, 3–7 concern cultural skills, and 8–10 concern cultural metacognition. Cronbach's Alpha was used to evaluate the internal consistency of Questionnaire 1. Table 1 shows that Cronbach's Alpha for the CriTT was 0.887, for the SFQS was 0.931, and for the whole questionnaire was 0.934. For standardized items, the CriTT was 0.905, the SFQS was 0.931, and the whole questionnaire was 0.943. Additionally, the Cronbach's alpha values of the original CriTT (Stupple et al., 2017) were 0.92 for CCT, 0.79 for VCT, and 0.60 for MCT, and the version in Questionnaire 1 shows higher reliability (CCT: 0.949, VCT: 0.804, MCT: 0.686) than the original one. Thomas et al. (2015) reported that the original SFCQ had a Cronbach's α of 0.88, and the reliability of the SFCQ was found to be 0.931 in Questionnaire 1. These results reflect that Questionnaire 1 was highly reliable.

3.3.2 Reliability and validation of Questionnaire 2

Questionnaire 2 comprises the CriTT, CQS, and QEWB, with 68 items divided into three parts. The first part has 27 items from the CriTT. The second part comprises 20 items from the CQS. Questions 1–4 concern Metacognitive CQ (MC), 5–10 concern Cognitive CQ (COG), 11–15 concern Motivational CQ (MOT), and 16–20 concern Behavioral CQ (BEH). The third part has 21 items from QEWB. As seen in Table 2, Cronbach's Alpha for the CriTT was 0.920, for the CQS was 0.971, for the QEWB was 0.928, and for the whole questionnaire was 0.976. For standardized items, the CriTT was 0.929,

TABLE 2 The validation of Questionnaire 2.

	Cronbach's alpha	Cronbach's alpha based on standardized items	N of items
CriTT	0.920	0.929	27
CCT	0.968	0.968	17
VCT	0.869	0.878	6
MCT	0.737	0.737	4
CQS	0.971	0.972	20
MC	0.912	0.914	4
COG	0.951	0.951	6
MOT	0.928	0.928	5
BEH	0.953	0.953	5
QEWB	0.928	0.935	21
Questionnaire 2	0.976	0.978	68

the CQS was 0.972, the QEWB was 0.935, and the whole questionnaire was 0.978. Moreover, compared to Cronbach's alpha values of the original CriTT (CCT: 0.92, VCT: 0.79, MCT: 0.60), the current CriTT dimensions exhibit higher reliability (CCT: 0.968, VCT: 0.869, MCT: 0.737). The current CQS demonstrates higher reliability across all dimensions (MC: 0.914, COG: 0.951, MOT: 0.928, BEH: 0.953) compared to the original one (MC: 0.71–0.77, COG: 0.8–0.88, MOT: 0.77–0.79, BEH: 0.82–0.84, Ang et al., 2007). Waterman et al. (2010) reported that the original QEWB had a Cronbach's alpha of 0.86, while the QEWB in Questionnaire 2 shows a higher Cronbach's alpha of 0.928. Table 2 indicates that Questionnaire 2 has improved reliability over the original CriTT, CQS, and QEWB.

3.3.3 The selection of participants for qualitative analysis in Study 2

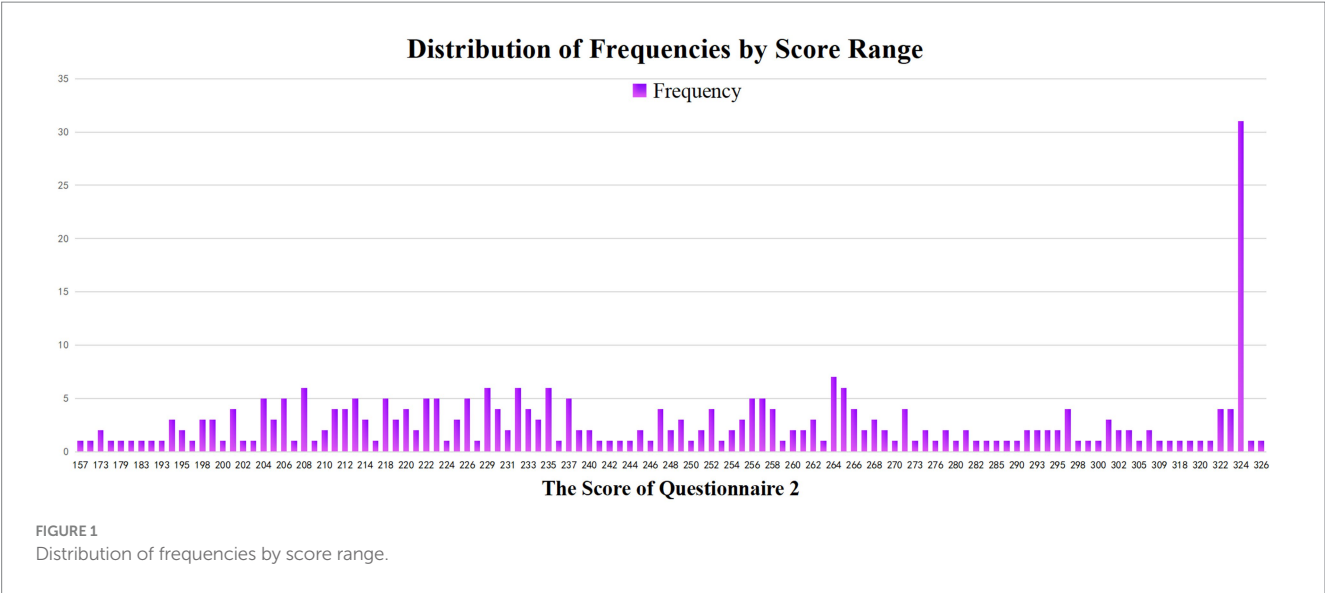
Table 3 shows that the maximum Questionnaire 2 score was 326, and the minimum was 157. Figure 1 shows that approximately 35 participants are clustered in the score range between 322 and 326. Thirty assignments from the participants with the highest score in Questionnaire 2 were randomly selected to analyze in NVivo 20.0.

3.3.4 Narrative analysis

The narrative analysis of qualitative research in Study 2 includes open, axial, and selective coding to refine the core themes. The narrative coding strategies referenced Charmaz's (2014) identity analytic categories in grounded theory, ensuring the findings were grounded in the raw data. According to Squires (2023), six-steps of thematic analysis enhance the trustworthiness of qualitative data: "1. familiarizing oneself with the data, 2. generating initial codes, 3. searching for themes, 4. reviewing themes, 5. defining and naming themes, and 6. reporting findings." In Study 2, after the raw data collection, the open-coding process began with an in-depth engagement with the data, during which key terms and phrases were identified as initial codes. The initial codes act as the basis for further analysis, and the complexity and richness of participants' experiences are organized and concluded in this phase. Axial coding was then applied to connect these concepts and develop the important categories and subcategories, which were refined and integrated into

TABLE 3 Descriptive statistics of the variables.

	N	Minimum	Maximum	Mean	Std. deviation
The total score of Questionnaire 2	311	157	326	252.408360	41.7896861
Valid N (listwise)	311				



the core themes for further review, refining, and modification. Finally, these core themes were defined and named, ultimately demonstrated in the research findings.

4 Results

4.1 The findings of Study 1

4.1.1 Relationship between critical thinking belief (CTB) and cultural intelligence (CQ)

Pearson's correlation (SPSS 20.0) was applied to analyze the relationship between critical thinking beliefs (CTB) and the CQ dimensions (see Table 4). The relationships among Confidence in Critical Thinking (CCT), Valuing Critical Thinking (VCT), Misconceptions about critical thinking (MCT), Cultural Knowledge (CK), Cultural Skills (CS), and Cultural Metacognition (CM) were analyzed. As shown in Table 4, the correlation between these dimensions ranged from -0.360 to 0.842 , and each correlation coefficient was statistically significant ($p < 0.01$). Among them, the total score of CTB and CQ had a strong positive correlation ($r = 0.761$, $p < 0.01$); For the three dimensions of CTB, CCT was positively related to CK ($r = 0.592$, $p < 0.01$), CS ($r = 0.717$, $p < 0.01$), CM ($r = 0.764$, $p < 0.01$), and total score of CQ ($r = 0.770$, $p < 0.01$); VCT was also positively related to CK ($r = 0.595$, $p < 0.01$), CS ($r = 0.615$, $p < 0.01$), CM ($r = 0.600$, $p < 0.01$), and total score of CQ ($r = 0.660$, $p < 0.01$). However, MCT were negatively related to CK ($r = -0.360$, $p < 0.01$), CS ($r = -0.515$, $p < 0.01$), and CM ($r = -0.501$, $p < 0.01$), and total score of CQ ($r = -0.522$, $p < 0.01$).

Moreover, strong positive correlations are also founded between CCT and the total score of CTB ($r = 0.968$, $p < 0.01$), between CK and the total score of CQ ($r = 0.968$, $p < 0.01$), and between CM and total score of CQ ($r = 0.924$, $p < 0.01$). MCT was not only negatively related to every dimension of SFCQ but also negatively related to CCT ($r = -0.645$, $p < 0.01$), VCT ($r = -0.558$, $p < 0.01$), and the total score of CTB ($r = -0.499$, $p < 0.01$). Funder and Ozer (2019) states that if $r = 0.4$ or above, the effect size in psychological research can be very substantial, indicating that this study's result could provide explanatory insights into the relationship between critical thinking and CQ. The results of Study 1 indicate significant correlations between critical thinking beliefs and cultural intelligence. The result of this part suggests that being confident when applying critical thinking or attaching importance to critical thinking will significantly affect acquiring cultural knowledge, operating cultural skills, and performing metacognition. Additionally, the misunderstanding of critical thinking will considerably affect the application of critical thinking and cultural intelligence.

4.2 The findings of Study 2

4.2.1 Results of quantitative analysis in Study 2

4.2.1.1 Relationship between critical thinking belief (CTB), cultural intelligence (CQ), and eudaimonic well-being (EWB)

Table 5 reveals a significant positive correlation between CTB and CQ ($r = 0.872$, $p < 0.01$). This result aligns with that reported in Table 4. Both tables demonstrate a strong relationship between critical thinking

TABLE 4 Pearson correlation for all the study variables ($n = 510$).

	CCT	VCT	MCT	CTB	CK	CS	CM
CCT	–						
VCT	0.759**	–					
MCT	–0.645**	–0.558**	–				
CTB	0.968**	0.844**	–0.499**	–			
CK	0.592**	0.595**	–0.360**	0.622**	–		
CS	0.717**	0.615**	–0.515**	0.702**	0.692**	–	
CM	0.764**	0.600**	–0.501**	0.743**	0.620**	0.842**	–
CQ	0.770**	0.660**	–0.522**	0.761**	0.793**	0.968**	0.924**

** $p < 0.01$ (2-tailed).

TABLE 5 Pearson correlation for critical thinking belief (CTB), cultural intelligence (CQ) and eudaimonic well-being (EWB).

	CTB	CQ	EWB
CTB	–	0.872**	0.728**
CQ	0.872**	–	0.833**
EWB	0.728**	0.833**	–

** $p < 0.01$ (2-tailed).

belief and cultural intelligence, regardless of measurement method (SFCQ or CQS). Additionally, EWB was positively related to CQ ($r = 0.833$, $p < 0.01$) and CTB ($r = 0.728$, $p < 0.01$). This result indicates that individuals with strong critical thinking beliefs and high cultural intelligence are likely to have higher levels of eudaimonic well-being.

4.2.1.2 Relationships between eudaimonic well-being (EWB) and each dimension of critical thinking belief and cultural intelligence

Pearson's correlation (SPSS 20.0) was still used to examine the connections between eudaimonic well-being and each facet of critical thinking belief and cultural intelligence. Table 6 displays the correlation between eudaimonic well-being (EWB), Confidence in Critical Thinking (CCT), Valuing Critical Thinking (VCT), Misconceptions about critical thinking (MCT), Metacognitive CQ (MC), Cognitive CQ (COG), Motivational CQ (MOT), and Behavioral CQ (BEH). The research findings varied from -0.523 to 0.844 ; each correlation coefficient was statistically significant ($p < 0.01$). As shown in Table 6, EWB is positively related to all other dimensions. The results demonstrate that EWB has a strong positive correlation with CCT ($r = 0.766$, $p < 0.01$), VCT ($r = 0.698$, $p < 0.01$), MC ($r = 0.725$, $p < 0.01$), COG ($r = 0.763$, $p < 0.01$), MOT ($r = 0.739$, $p < 0.01$), and BEH ($r = 0.762$, $p < 0.01$). Moreover, EWB strongly correlates negatively with MCT ($r = -0.711$, $p < 0.01$).

Among the dimensions of CriTT, CCT was positively related to VCT ($r = 0.844$, $p < 0.01$). MCT were negatively related to CCT ($r = -0.692$, $p < 0.01$) and VCT ($r = -0.678$, $p < 0.01$). Among the dimensions of CQS, MC is positively related to COG ($r = 0.726$, $p < 0.01$), MOT ($r = 0.732$, $p < 0.01$), and BEH ($r = 0.721$, $p < 0.01$). COG is positively related to MOT ($r = 0.751$, $p < 0.01$) and BEH ($r = 0.718$, $p < 0.01$). MOT is positively related to BEH ($r = 0.810$, $p < 0.01$). Table 5 demonstrates the strong correlation between critical thinking beliefs and cultural intelligence. In Table 6, CCT is positively related to MC ($r = 0.846$, $p < 0.01$), COG ($r = 0.786$, $p < 0.01$), MOT ($r = 0.807$,

$p < 0.01$), and BEH ($r = 0.766$, $p < 0.01$). VCT is also positively related with MC ($r = 0.744$, $p < 0.01$), COG ($r = 0.677$, $p < 0.01$), MOT ($r = 0.713$, $p < 0.01$), and BEH ($r = 0.701$, $p < 0.01$). Besides, strong negative correlations are also found between MCT and MC ($r = -0.599$, $p < 0.01$), COG ($r = -0.635$, $p < 0.01$), MOT ($r = -0.547$, $p < 0.01$), and BEH ($r = -0.523$, $p < 0.01$).

4.2.2 Results of qualitative analysis in Study 2

As Figure 2 demonstrates, the research findings indicate that the cultural well-being diagram comprises four different themes (Well-being, Cultural intelligence, Critical thinking, and Facing challenges), each representing a specific theme derived from the participants' descriptive data.

The strategy to categorize identity should concern "selfhood, autonomy, legitimacy, and control." (Charmaz, 2014) In detail, these concerns include "Embodiment and consciousness, Individual and collective action, Cooperation and conflict, Choice and constraint, Meanings and actions, Standpoints and differences, Ritual and ceremony, Positions and networks, Power and prestige, Structure and process, Opportunities and inequalities, Rights and resources, Moral life, moral action, and moral responsibility." (Charmaz, 2014) In line with that, this research categorizes the themes of cultural identity in the scope of Well-being (Independence and interdependence, self-awareness and self-regulation, growth and development, empathy and perspective-taking), Cultural Intelligence (identity and diversity, cultural adaptations, globalization, and responsibility, seeking evidence and reasoning), Critical thinking (mindfulness and meditation, critical reflection and analysis, open-mindedness), and Facing challenges (cultural differences, beliefs and values, resilience, and coping strategies). These themes are demonstrated explicitly in Figures 2–5 and the samples of participants' narrations. For research ethics, the participants are represented by S1, S2, S3, ..., S30.

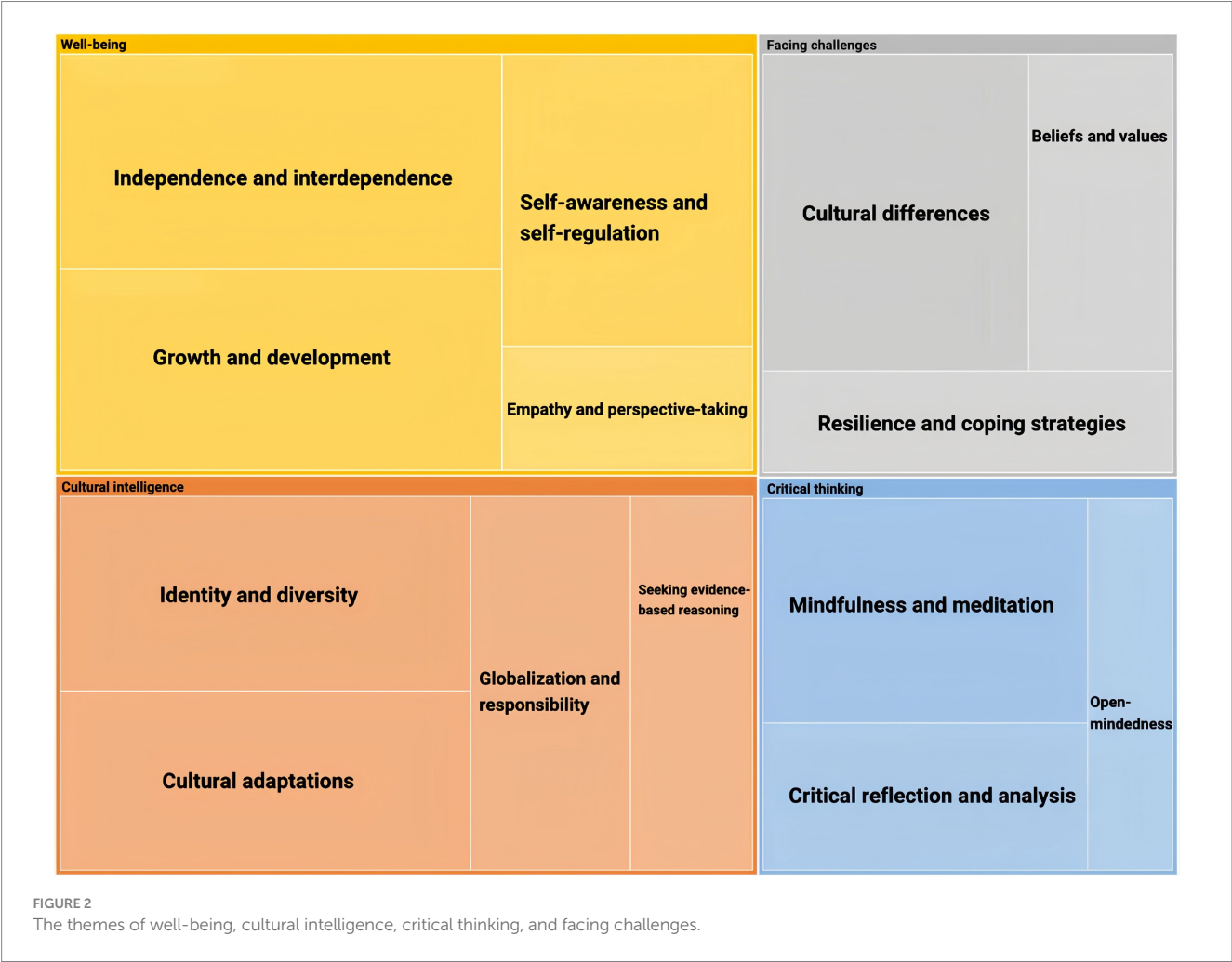
4.2.2.1 The theme of psychological well-being

Figure 3 shows that the well-being theme contains four categories: Growth and development, Independence and interdependence, Empathy and perspective-taking, and Self-awareness and self-regulation. According to Ryff (2023a), research on eudaimonia should adopt a broader perspective, focusing on societal and community issues. These categories in Figure 3 are necessary elements of well-being (Ryff, 2014; Haybron, 2016). These elements contribute to individual well-being and the greater good, as individuals can enhance their personal development through altruism, community involvement, and helping those in need.

TABLE 6 Pearson correlation for eudaimonic well-being (EWB) and each dimension of critical thinking belief (CTB) and cultural intelligence (CQ) (n = 311).

	EWB	CCT	VCT	MCT	MC	COG	MOT
EWB	–	–	–	–	–	–	–
CCT	0.766**	–	–	–	–	–	–
VCT	0.698**	0.844**	–	–	–	–	–
MCT	–0.711**	–0.692**	–0.678**	–	–	–	–
MC	0.725**	0.846**	0.744**	–0.599**	–	–	–
COG	0.763**	0.786**	0.677**	–0.635**	0.726**	–	–
MOT	0.739**	0.807**	0.713**	–0.547**	0.732**	0.751**	–
BEH	0.762**	0.766**	0.701**	–0.523**	0.721**	0.718**	0.810**

**p < 0.01 (2-tailed).



The part of Growth and development represents personal growth in coping with cultural difficulties. It is the process of expanding and improving oneself and advancing one's skills and abilities. Figure 3 demonstrates that personal growth can be further generated in the four approaches: The reward of learning, Achieving goals, Persistence Pays Off, and Positive contributions. The reward of learning demonstrates that individual development can be achieved by continuous learning and obtaining new knowledge and skills.

S17: To get the life you want in the future, you should always stay true to yourself and have new ideas. Time management is important, for it is the key to learning new things. Only in this way can one stay competitive and overcome the cultural boundaries of design inspiration.

Achieving Goals is a way to foster personal development, experience a sense of accomplishment, and appreciate an individual's potential. Persistence Pays Off emphasizes the importance of perseverance and resilience when confronted with obstacles and

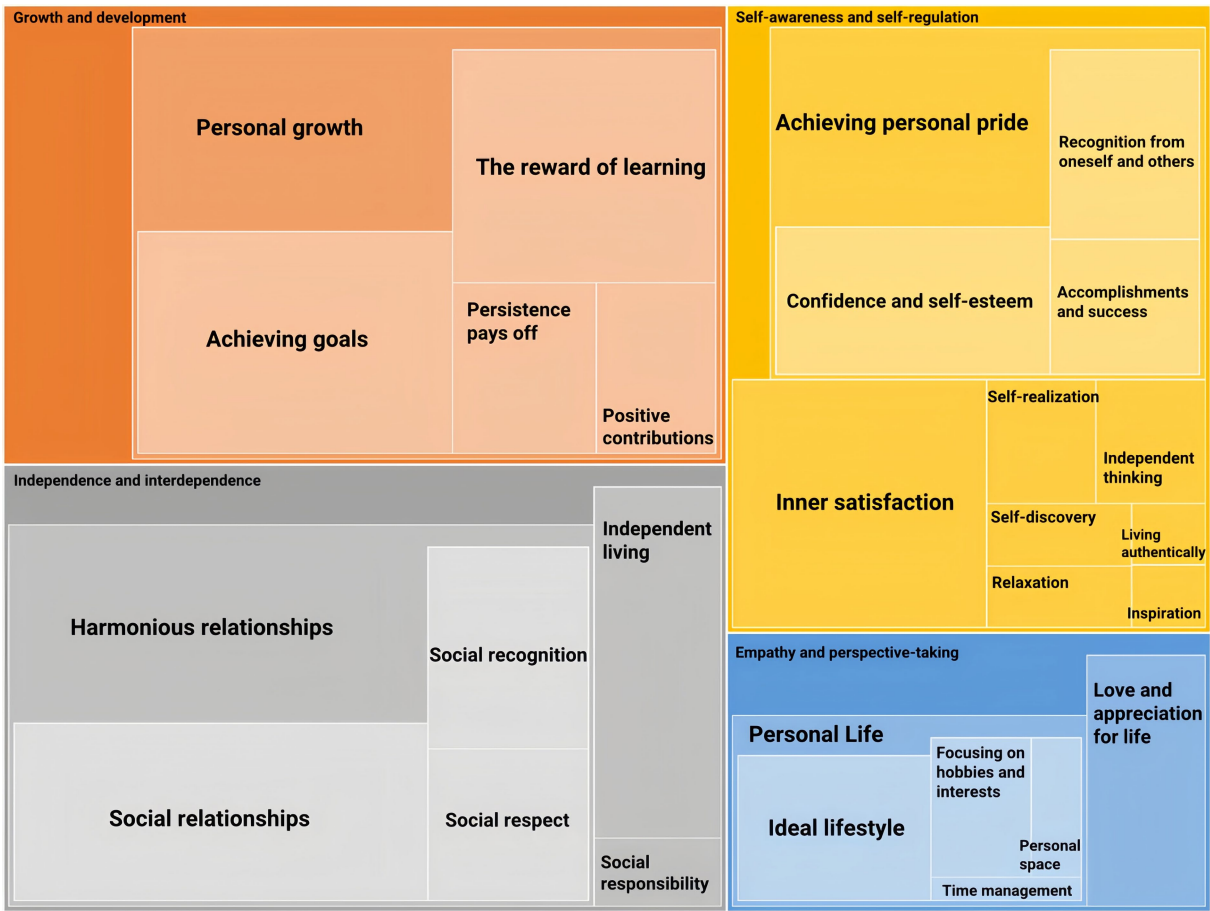


FIGURE 3
The theme of psychological well-being.

disappointments. Positive contributions involve actions that benefit both others and the global community. These two elements involve personal and societal approaches necessary for individual growth and a meaningful life.

S10: My future life should be fulfilling and full of hope. I should be able to do what I like, have creativity and initiative, and have ample time for artistic creation. Achieving this dream will give my future more hope, increase my happiness, and make me feel fulfilled. Therefore, I need to work hard to achieve my vision of a dream life for the future.

Independence and interdependence are other significant factors that influence well-being, which include three parts: Harmonious relationships, Independent living, and Social responsibility and contributions. Harmonious relationships encompass Social recognition, Social relationships, and Social respect, which are essential for maintaining positive emotional well-being. Social recognition involves the feelings acknowledged by others. Social relationships represent the interpersonal connections we establish with others, such as family, friends, and classmates. Social respect involves kindness, empathy, and understanding acquired through positive interactions with others. Harmonious relationships illustrate how participants develop self-esteem, confidence, and a sense of belonging. Independent

living is another attribute that significantly affects one's sense of autonomy and control over life. Social responsibility and contributions represent making a positive impact on society, providing participants with a chance to experience a profound sense of meaning, satisfaction, and affiliation with a higher entity. Independence and interdependence offer an angle for how individuals gain well-being by establishing connections between their ideal identity and that of others. Participants emphasize the capacity to live well and independently while contributing to society's well-being.

Self-awareness and self-regulation illustrate the concept of the self in both Chinese and Western cultures. Self-awareness embodies the principle of “*向內觀己*” (*xiàng nèi guān jǐ*) in Chinese philosophy, which can be comprehended as “*introspection*.” This refers to examining thoughts, feelings, and motivations to gain thoughtful insights into one's identity. Self-regulation represents [McAdams \(2013\)](#) concept of “*social actor*” in personal identity establishment. [McAdams \(2013\)](#) proposes that from [Freud's \(1961\)](#) view, self-regulation is a crucial “*lifelong function, which is to observe the self and keep impulses in check*.” It is essential for a “*social actor*” to learn to control impulses and think critically about every decision in identity development.

[Figure 3](#) shows that Self-awareness and self-regulation encompass Achieving personal pride, Independent thinking, Inner satisfaction, Inspiration, Living authentically, Relaxation,

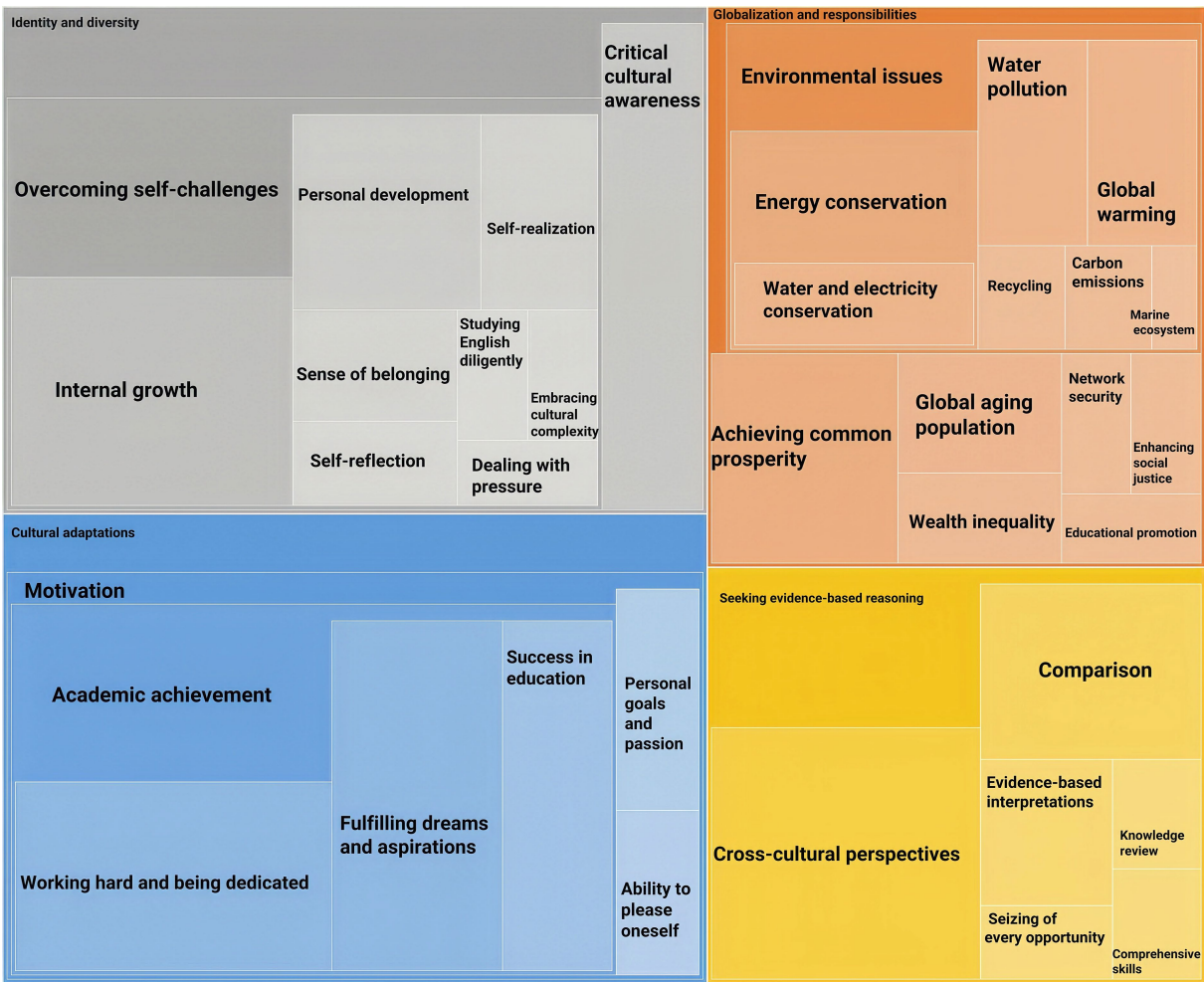
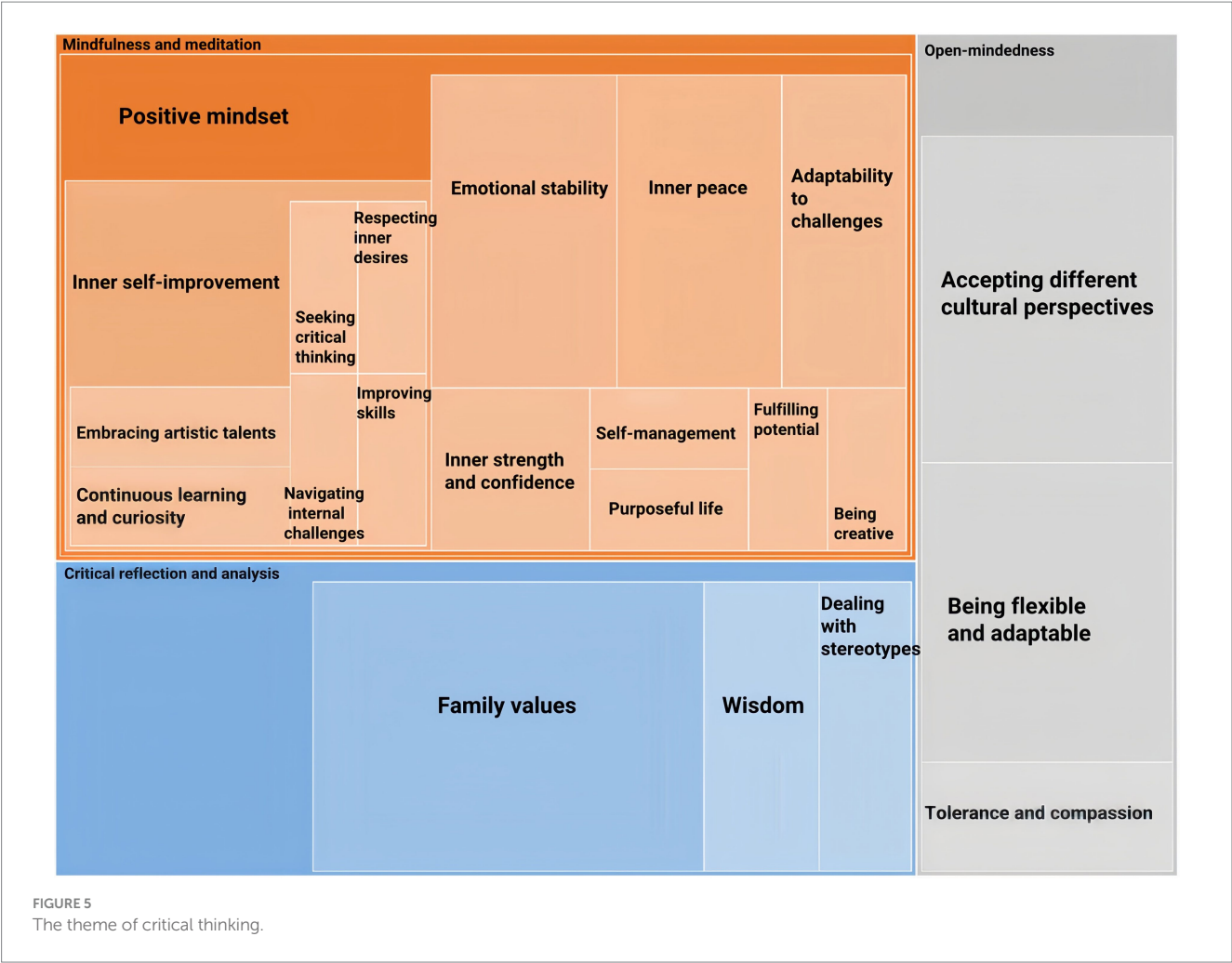


FIGURE 4
The theme of cultural intelligence.

Self-discovery, and Self-realization. Achieving personal pride comprises three factors: Accomplishments and success, Confidence and self-esteem, and Recognition from oneself and others. These elements demonstrate how participants cope with their personal goals, motivations, values, and future aspirations in their identity development process. They also combine the typical elements of Chinese cultural identity, such as Inner satisfaction, Relaxation, and Living authentically (Peng, 2023), which represent a comprehension of cultural identity deeply rooted in the Chinese philosophy of inner peace, harmony, and introspection. Independent thinking, inspiration, self-discovery, and self-realization demonstrate the conventional elements of Western cultural identity, such as independence, individualism, and inspiration-motivated thoughts (Peng, 2023).

S4: Personal growth involves aspects such as self-awareness, emotional management, and independent thinking. I will regularly self-reflect, identify my strengths and weaknesses, and actively adjust my mindset to achieve this goal. Additionally, I will pay attention to my thinking patterns, cultivate the ability to think independently and strive to become a more mature and independent individual.

In Figure 3, Empathy and perspective-taking demonstrate the opinion of taking good care of oneself, including Love and appreciation for life and Personal Life. According to Steger et al. (2008), there is a positive correlation between eudaimonic behavior and well-being, while the relationship between hedonic behavior and well-being is less consistent. Empathy and perspective-taking represent prioritizing self-care, which is crucial for holistic well-being and an effective way to maintain a healthy balance in life. Love and appreciation for life are critical self-care goals. Participants said that they could develop a positive mindset from small pleasures and expressing gratitude for daily life. Personal life in Figure 3 illustrates various aspects that contribute to well-being and consists of four elements: Focusing on hobbies and interests, Ideal lifestyle, Personal space, and Time management. Participants desired an ideal lifestyle that allowed them space and time to develop hobbies and interests, such as dance, playing instruments, or writing novels. They believed that having a positive perspective on the ideal lifestyle could be a guiding principle for creating a meaningful and fulfilling life. They also hoped to effectively manage their time for both professional and recreational pursuits. Many participants uphold the traditional Chinese principle of “修身养性” (xiū shēn yǎng xìng), which emphasizes personality development. This involves practicing self-discipline and fostering inner growth through ethical pursuits.



S5: My future dream is to have a peaceful and harmonious family and a society filled with love and care. I would feel a sense of value and accomplishment if I could contribute positively to society, such as participating in volunteer activities or supporting charitable causes. Similarly, I would be delighted to provide my family with a warm and comfortable living environment, allowing them to feel my love and care. Of course, realizing this goal requires continuous learning and personal growth to improve my abilities and qualities. I believe achieving this dream has a significant impact on my well-being.

4.2.2.2 The theme of cultural intelligence

Figure 4 shows that the theme of cultural intelligence contains four categories: Identity and diversity, Cultural adaptations, Globalization and responsibilities, and Seeking evidence-based reasoning. These four illustrate what guides individuals to thrive in a diverse cultural context.

Identity and diversity involve complex interactions between original cultural identity and diverse cultural phenomena, beliefs, and traditions. This category consists of two elements: Critical cultural awareness and Overcoming self-challenges. Critical cultural awareness involves cultivating curiosity and openness and being willing to challenge and suspend preconceived beliefs about other cultures and one's own (Holliday, 2011). This entails the recognition and

appreciation of cultural differences in beliefs and traditions. Participants demonstrate their critical cultural awareness of well-being. They thought that there were some differences between well-being in the Chinese and Western cultures, but most concepts were similar, such as inner peace, self-satisfaction, and harmonious relationships with others.

S15: Chinese people are influenced by Confucianism and Taoism, valuing concepts such as “benevolence” and “ritual.” They see the spiritual world as superior to material life and circumstances, viewing it as a spiritual experience beyond wealth and status. In the West, Democritus believed that “pleasure and discomfort” constituted the standard for what should and should not be done, with happiness being the joy of the spirit and peace of the soul. Well-being has a common definition in Chinese and Western cultures.

Figure 4 illustrates that Overcoming self-challenges includes Internal growth, Personal development, Self-realization, Self-reflection, A sense of belonging, Dealing with pressure, Embracing cultural complexity, and Studying English diligently. These elements demonstrate how to confront biases, prejudices, and stereotypes toward cultural differences. By dealing with the pressure of cultural complexity and language problems, the participants revealed that internal growth, personal development, self-realization, self-reflection,

and a sense of belonging were rewarding experiences after overcoming cultural challenges.

S3: To acquire well-being regardless of culture, I must be well-planned and prepared. First, I need to work hard to learn English and improve my language skills to communicate better with the locals. I also need to understand the culture, laws, and regulations of the United States to better adapt to the local environment. As long as I persevere and move forward courageously, I can achieve this goal and live a happy life in other countries.

The category Cultural adaptations contain only one element: Motivation. Figure 4 shows that Motivation comprises three elements: Ability to please oneself, Personal goals and passion, and Academic achievement. The ability to please oneself represents the vital ability to appreciate one's culture. Personal goals and passion represent those crucial elements in identifying purposeful goals, such as pursuing a specific career path and developing new skills. Most participants believed that understanding their desires could help them cope better with the stress of cultural adaptation, such as traveling worldwide, acquiring fluent oral English, and becoming interculturally competitive in other countries. Academic achievement encompasses three elements: Fulfilling dreams and aspirations, Working hard and being dedicated, and Success in education. Fulfilling dreams and aspirations was an essential motivation for participants. This involves seeking a higher education degree, embarking on a new career, and enhancing quality of life. Besides, in the participants' opinion, hard work and dedication were effective methods to achieve cultural well-being and gain control of life. Success in education represents learning and thriving in a new cultural environment.

S9: Passing the college entrance examination was a personal achievement for me and a step towards promoting cultural communication through art. It has equipped me with the necessary skills and knowledge to contribute to cultural development through public art. By injecting vitality into urban spaces, I hope to bridge cultural gaps and foster a deeper appreciation for diversity. Furthermore, bringing joy and inspiration to others through art makes me feel that I have a valuable and meaningful life, which is also a kind of indescribable happiness.

Figure 4 also shows a new attribute of cultural intelligence: Globalization and responsibilities, which encompass Achieving common prosperity, Educational promotion, Enhancing social justice, Environmental issues, Global aging population, Network security, and Wealth inequality. The international issues that concern the participants represent how individuals consider these global challenges. Achieving common prosperity demonstrates the participants' wish to create a more inclusive and equitable society where all individuals can thrive. Educational promotion, Enhancing social justice, and Wealth inequality highlight empathy and understanding toward others. Global aging population and Network security are two pressing concerns in today's interconnected world, reflecting participants' views on the importance of aging people's well-being and a more secure and supportive global environment for all.

Furthermore, identity is commonly explored within social and intercultural frameworks. However, individuals' perceptions of their identities extend far beyond these contexts. Kunchambo et al. (2021)

propose that research on identity should also consider individuals' cognition, emotions, and behaviors toward the natural environment. They applied "ecological identity" to explain the dynamic process of how individuals interact with the natural environment, social roles, language, and self-reflection. Developing ecological identity requires attention to three key aspects: "Connectedness, care, and commitment." These three aspects explain emotions, cognition, concern, responsibility, and obligation toward the natural environment, which are also important elements of well-being. As Figure 4 illustrates, Environmental issues involve some of the most pressing global challenges with far-reaching impacts, which include Carbon emissions, Energy conservation, Global warming, Marine ecosystem, Recycling, and Water pollution. These environmental problems are complex and interconnected, and the participants' perspectives reflect a profound comprehension of global ecological cultures.

The last category of the cultural intelligence theme, as Figure 4 shows, is Seeking evidence-based reasoning, which includes Comparison, Comprehensive skills, Cross-cultural perspectives, Evidence-based interpretations, Knowledge review, and Seizing of every opportunity. These elements involve the participants' strategies and approaches to dealing with cultural problems, representing metacognitive, cognitive, and behavioral CQ. Comparison and comprehensive skills help participants analyze cultural differences, embrace various viewpoints, and stay updated on cultural trends and developments. Cross-cultural perspectives and evidence-based interpretations help individuals better understand and empathize with others. Knowledge review and seizing every opportunity involve engaging with individuals from different cultural backgrounds and learning from their experiences without stereotypes or assumptions.

S16: The concept of "well-being" in Chinese culture and Western culture emphasizes harmony and balance between individuals and society and considers it one of the most important goals in life. Happiness in both cultures is closely related to family, interpersonal relationships, health, and inner satisfaction. In both Chinese and Western cultures, people believe that spending quality time with family and friends is a part of well-being.

4.2.2.3 The theme of critical thinking

As Figure 5 shows, the theme of critical thinking involves three categories: Critical reflection and analysis, Mindfulness and meditation, and Open-mindedness. Applying critical thinking is a complex and multifaceted process requiring individuals to reflect critically and analyze, practice mindfulness and meditation, and cultivate open-mindedness.

Critical reflection and analysis consist of three elements that are essential for personal growth, as Figure 5 illustrates: Family values, Dealing with stereotypes, and Wisdom. This section demonstrates how participants addressed stereotypes, examined family values, and applied their wisdom to understand themselves and others better.

S1: Although there are many differences between Chinese and Western cultures, there are many similarities in the concept of "happiness." These similarities transcend cultural differences and become one of the common goals pursued by humanity.

S19: Christmas and the Spring Festival can be small consolations of "happiness" in Chinese and Western cultures. During Christmas,

people hold Christmas parties and send greetings to family and friends, while Chinese people set off firecrackers and visit relatives during the Spring Festival. Both are expressions of the same emotions, so the “well-being” in Chinese and Western cultures embodies the same emotions of people.

As Figure 5 demonstrates, Mindfulness and meditation contain only one element: Positive mindset, which involves a variety of personalities and habits that help participants overcome the challenges of achieving well-being: Inner self-improvement, Emotional stability, Inner peace, Adaptability to challenges, Inner strength and confidence, Self-management, Purposeful life, Fulfilling potential, and Being creative.

Mindfulness is associated with meditation, which involves noticing or ignoring rules, regulations, relationships, consequences, and contexts (Dacey et al., 2016). Ting-Toomey (2015) stated that in both Eastern and Western cultures, mindfulness is a way to cultivate awareness, presence, and empathy in communication and relationships. Holland et al. (2017) stated that cognitive function could be enhanced through mindfulness and meditation practices to improve critical thinking skills. Mindfulness and meditation can also help individuals reduce stress and negative emotions and cultivate a sense of adaptability to cultural identity negotiations (Ting-Toomey, 2015). The research findings in Figure 5 show how participants learn to approach cultural challenges to achieve personal growth. Creative thinking allows students to find innovative solutions to problems and navigate through the complexities of cultural adaptation. Stable emotions and inner peace also help them establish inner strength and confidence, enabling them to face difficulties with courage and resilience. Purposeful life and self-management empower participants to take control of their lives and manage their thoughts, emotions, and actions when dealing with cultural conflict.

S12: As a human being, your life is filled with endless possibilities - choices that can lead to opportunities and opportunities that can lead to growth. However, if there is one task considered to be the most challenging in our lives, it is to become a true individual who thinks independently and knows themselves. We live in a complex and ever-changing world, surrounded by various expectations, values, and social pressures of different cultures. As members of society, we are inevitably influenced by external factors, but becoming a person means bravely facing our inner challenges and exploring our beliefs, values, needs, and goals.

Moreover, Figure 5 demonstrates that Inner self-improvement includes Embracing artistic talents, Continuous learning and curiosity, Seeking critical thinking, Respecting inner desires, Navigating internal challenges, and Improving skills. Inner self-improvement provides a new perspective on self-growth. Participants thought that achieving cultural well-being was a process of learning and practicing; it required dedication and commitment to improve oneself and constantly striving for personal growth. Continuous learning and curiosity, improved skills, and critical thinking are the three essential components of a positive mindset, which enable individuals to expand their horizons and gain a deeper understanding of the world around them. Additionally, embracing artistic talent, navigating internal challenges, and respecting inner desires are three components that represent a significant intrinsic motivation driving identity formation. According to Waterman (2004), intrinsic motivation is an essential driving force

that stimulates individuals' strong interest in and passion for specific goals, values, and beliefs, thereby promoting identity development.

Figure 5 shows that the third category is Open-mindedness, which includes three elements: Accepting different cultural perspectives, Being flexible and adaptable, and Tolerance and compassion. Open-mindedness is essential for individuals to understand and appreciate various cultures. The results showed that participants learned to view well-being in different cultures from a tolerant and objective perspective. Tolerance and compassion are essential for individuals to deal with problems of culture and identity in various situations, such as undertaking global responsibility (Kunchambo et al., 2021), coping with language learning barriers (Oxford, 2018), and facing human suffering (Ryff, 2022, 2023a, 2023b). This is the foundation for accepting different cultural perspectives, which creates a third space between cultures, as Bhabha (1990) proposed, allowing for a more fluid and flexible expression of cultural identity and avoiding cultural stereotypes.

4.2.2.4 The theme of facing challenges

Figure 6 shows that Facing challenges includes three categories: Cultural differences, Beliefs and values, Resilience and coping strategies.

The category of Cultural differences contains one element: Western and Chinese views on happiness, which can be divided into two attributes: Chinese perspective on happiness and Western perspective on happiness. In the participants' views, the Chinese emphasize family harmony and the greater good, while the Westerners pursue individual independence and freedom. These differences are explicitly distinguished by beliefs and values that significantly impact cultural identity.

Beliefs and values involve one element: Challenges of cultural identity adaptation, which include Harmony versus individual achievement, Individualism versus collectivism, Spiritual versus material, Altruism versus self-interest, and Stability versus personal growth. This section briefly discusses the struggles between different beliefs and values, revealing that individuals inevitably navigate a complex web of beliefs and values to achieve well-being, each with their own conflicts. Participants expressed various thoughts about coping with a purposeful life in Chinese and Western cultures. Harmony versus individual achievement represents adapting to one's cultural identity. In the participants' minds, Chinese culture prioritizes group well-being and strives for harmony and cooperation. By contrast, Western cultures value individual achievement and personal success. Individualism versus collectivism demonstrates participants' opinion that Western cultures emphasize the importance of individual freedom for individualism, while Chinese sometimes prioritize the group's needs over those of the individual for collectivism. Altruism versus self-interest highlights the contrast between the inherent inclination to benefit others and the natural tendency to prioritize personal needs.

S7: Nietzsche challenged traditional concepts of well-being, believing that happiness does not come from the pursuit of morality and reason but from individual self-realization and creativity. He advocated for people to break free from the constraints of traditional moral and value concepts, pursue their desires and passions, and thus achieve their value and happiness. Unlike more extroverted Westerners, Chinese people have traditionally been introverted, not overly enthusiastic in pursuing personal well-being, and often prioritizing the nation and society.

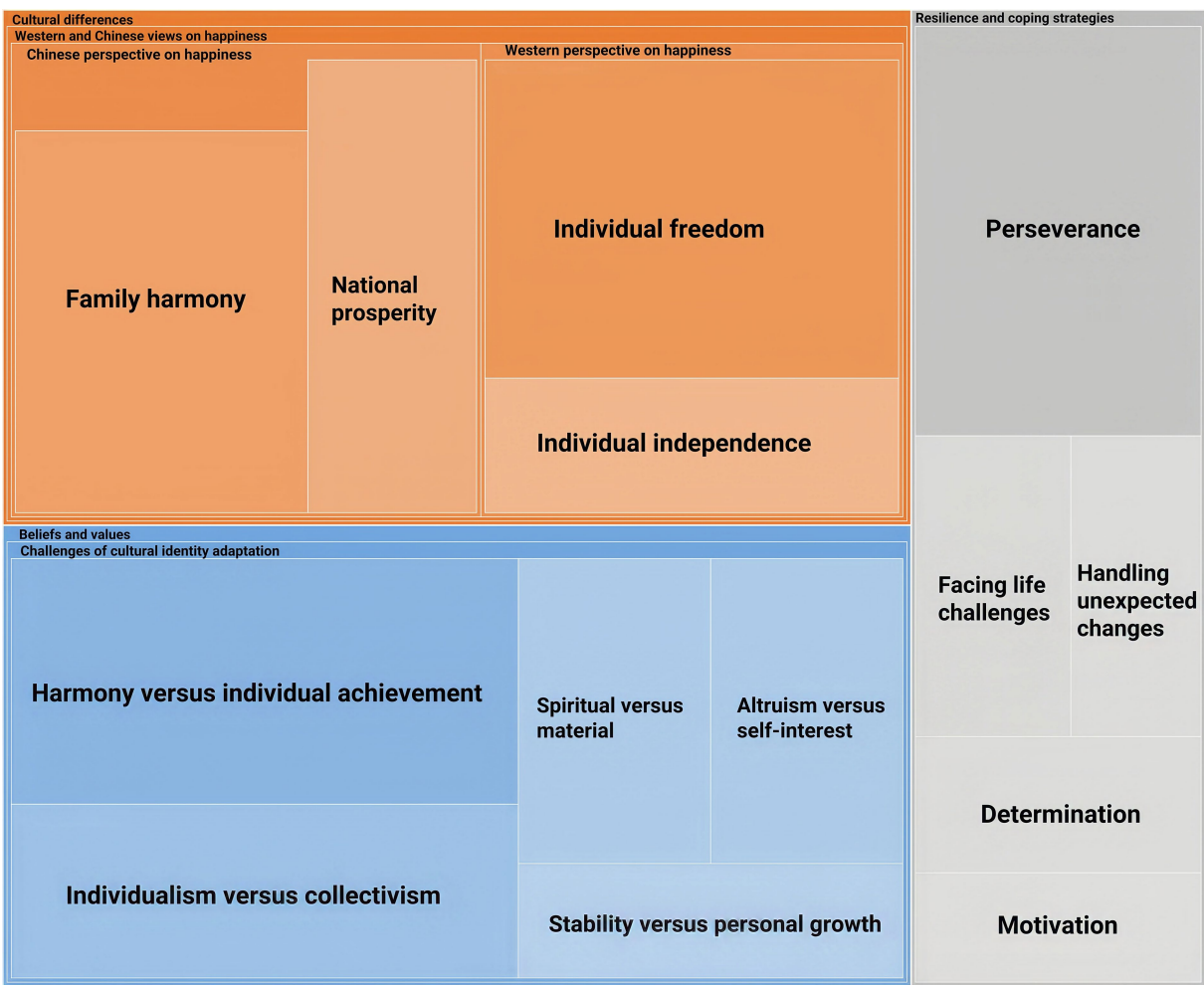


FIGURE 6
The theme of facing challenges.

S11: Western culture emphasizes individualism, individual independence, freedom of choice, and pursuit of personal goals. In this culture, individuals emphasize their uniqueness, self-fulfillment, and the value of personal achievement. In Chinese culture, collectivism often influences self-worth, emphasizing the close relationship between individuals and the community. In collectivist cultures, individuals who maintain good social and family relationships frequently receive more support and security, increasing their happiness. Conversely, in individualistic cultures, individuals pursue independence and personal achievement and achieving personal goals can contribute to happiness.

Moreover, Spiritual versus material represents the tension between material wealth and spiritual values in cultural identity adaptation. In participants' minds, the Chinese prioritize spiritual fulfillment and inner peace, whereas in Western cultures, material wealth and possessions are highly emphasized and associated with psychological well-being. The participants thought it was necessary to balance these two values in this era of globalization. Additionally, Stability versus personal growth reveals that Chinese and Western cultures usually create conflicts between personal freedom and family bonds.

Participants thought that the Chinese always valued stability and tradition, believing that changes represent uncertainty that might cause harmful consequences; on the contrary, in Western cultures, embracing change and adventure is part of life.

S6: In Chinese culture, "well-being" is having a stable career, income, stable family, stable everything, a harmonious relationship among family members, and a deep love between them, always pursuing a stable life. In Western culture, "well-being" is a kind of spiritual satisfaction with unwavering love, steadfast friendship, and deep family ties. However, in Chinese culture, "happiness" feels more like a whole, as if as long as there is this whole, one will be happy, while in the West, it is more about a kind of happiness in one's spirit.

S19: As Confucius said, the wise find joy in water, and the benevolent find joy in mountains. The wise are active, the benevolent are calm. The wise find joy, the benevolent find longevity. However, in Western culture, people usually pursue happiness through career success and material wealth. In traditional Chinese culture, pursuing happiness tends to be more inward, focusing more on moral cultivation and emotional communication.

Figure 6 shows that Resilience and coping strategies comprise six elements: Perseverance, Facing life challenges, Handling unexpected changes, Determination, and Motivation. Cultural identity adaptation challenges communication, understanding, and acceptance of diverse perspectives (Ting-Toomey, 2015). Resilience and coping strategies reveal how participants navigate and overcome these challenges.

Perseverance and Facing life challenges are critical factors for individuals to maintain their goals and continue working toward them despite adversity. Participants' narratives demonstrate they have overcome many unexpended challenges in acknowledging themselves in life challenges. Handling unexpected changes is a significant aspect of cultural identity adaptation, representing a willingness to embrace change and be flexible in one's approach to navigating cultural differences (Dolce et al., 2023). Determination is essential when dealing with cultural identity adaptations. It allows individuals to overcome obstacles and setbacks and remain focused on their goals despite challenges (Waterman, 2011; Waterman and Schwartz, 2024; Waterman et al., 2024). Furthermore, as Figures 3–5 demonstrate, motivation is essential for cultural well-being. Figure 6 shows that motivation drives individuals to learn, develop, and engage with others. Sources of motivation can vary, stemming from personal aspirations, interpersonal connections, or a genuine curiosity about the world.

S14: My most challenging goal by far is to climb the highest peak of Mount Sangguniang, which is very high and cold, with a harsh environment and thin oxygen. One slight mistake could lead to a lack of oxygen or physical exhaustion and death. However, it is beautiful there. Once you reach the top, you will feel pride and accomplishment. I currently do not have enough experience to challenge my highest peak, and I need to ensure my safety in life, so I am still in the preparation stage. This is the most challenging goal I have ever faced so far.

5 Discussion

This research provides a holistic perspective on how individuals with critical thinking beliefs and cultural intelligence achieve their well-being when dealing with identity development challenges. As McAdams and Zapata-Gietl (2015) proposed, in Erikson's theory of identity, individuals' sense of identity over time is shaped by their experiences, abilities, and social roles. By understanding how these factors interact and influence one's sense of self, individuals can develop a stronger sense of purpose and direction. From this perspective, identity development is the intricate process in which individuals comprehensively understand their qualities, values, and beliefs. This research shows that achieving well-being is not a goal isolated from the other aspects of life; it is intimately intertwined with one's cultural identity. When individuals possess critical thinking beliefs and cultural intelligence, they navigate the challenges of identity development with greater resilience and adaptability.

Critical thinking and cultural intelligence play essential roles in cultural identity formation. In the quantitative part of this research, the CriTT (Critical Thinking Toolkit; Stupple et al., 2017), CQS (Cultural Intelligence Scale; Ang et al., 2007), the SFCQ (Short Form of Cultural Intelligence; Thomas et al., 2015), and the QEWB (Questionnaire for Eudaimonic Well-Being; Waterman et al., 2010) are applied to discover the interplay between critical thinking beliefs, cultural intelligence, and

eudaimonic well-being. In Study 1, the SFCQ and CriTT were used to discover the correlations between three dimensions of CriTT (Confidence in Critical Thinking, Valuing Critical Thinking, Misconceptions about critical thinking) and three of SFCQ (Cultural Knowledge, Cultural Skills, and Cultural Metacognition). In the quantitative part of Study 2, CriTT, QEWB, and CQS were applied to investigate the eudaimonic well-being, three dimensions of CriTT, and four of CQS (Metacognitive CQ, Cognitive CQ, Motivational CQ, and Behavioral CQ). The research findings demonstrate the significant correlation between eudaimonic well-being, critical thinking beliefs, and cultural intelligence. Critical thinking helps individuals maintain an open and flexible attitude when facing cultural differences, enhancing their understanding and appreciation of diverse cultures. Cultural intelligence emphasizes individuals' adaptability in different cultural contexts. They are crucial to personal growth and identity development, enabling individuals to think more deeply, reason more effectively, and ultimately lead a more prosperous life while pursuing well-being. The positive attitudes and beliefs about critical thinking enable individuals to question societal expectations, allowing them to forge their path rather than conform to predetermined roles.

In the qualitative part of Study 2, Figure 2 illustrates the identity landscape of participants' perceptions, strategies, and comprehension of psychological well-being across cultures. Taking this stance, the concept of "cultures" within cultural identity evolves into a more multidimensional paradigm. Cultural differences can impact how individuals perceive themselves and their abilities to control their behaviors (McAdams, 2013). According to McAdams (2013), psychological selfhood is a framework consisting of "social actor, motivated agent, and autobiographical author." "Actor" pertains to the representation of characteristics, personality, and other aspects of one's identity that are shaped by continuous interactions with society. "Agent" refers to "personal goals, motives, values, hopes and fears, and other features" for realizing achievement in life span. "Author" refers to being the creator of "a meaningful narrative for life." McAdams (2013) states that the effect of "author," which is how individuals make sense of past, present, and future through narrative, significantly impacts identity formation. In this "social actor, motivated agent, and autobiographical author" framework, "author" is expected to bear the most significant and enduring cultural effects. The research findings in Study 2 demonstrate the map of well-being between cultures and present how these three psychological selfhoods (social actor, motivated agent, and autobiographical author) interacted with participants' comprehension of cultural differences.

Purpose-building in life is influenced by various socio-cultural factors like language, societal norms, history, and belief systems (Moran, 2020). The four themes of Psychological well-being, Cultural intelligence, Critical thinking, and Facing challenges demonstrate how individuals approach identity constructions and pursue purpose in their lives. Participants' narrations are mainly about how they executive the psychological selfhoods of "actor, agent, and author" (McAdams, 2013) to realize their desired well-being. In the theme of well-being, Figure 3 illustrates the interconnection between how individuals cope with the relationship between the world and their internal selves. They have goals about the ideal life, such as personal growth, social relationships, and preferred lifestyle. In the theme of cultural intelligence, Figure 4 demonstrates the intricate web of cultural intelligence and its profound impact on individuals' life purpose-building processes. Participants in the study described the challenges

and strategies in coping with the cultural differences, which catalyze self-reflection and personal growth, leading them to redefine their goals and aspirations. This highlights cultural intelligence's role in enriching individuals' lives and deepening their understanding of themselves and the world. In the theme of critical thinking, Figure 5 illustrates the cognitive processes involved in purpose-building. Participants questioned and evaluated their values and beliefs in light of their experiences and interactions with the world around them. The results of this part reveal how individuals actively construct a purposeful life that is meaningful and authentic to them rather than passively accepting the purposes dictated by their culture or society. In the theme of facing challenges, Figure 6 shows that dealing with obstacles in life is a part of establishing psychological well-being. Despite their adversity, participants demonstrated resilience and perseverance in navigating these challenges. Many described how overcoming obstacles strengthened their sense of purpose and deepened their commitment to their goals. The research findings of this part highlight how facing challenges is essential for meaningful purpose-building and personal growth. By directly addressing obstacles and adapting to adversity, individuals can gain deeper self-awareness, achieve identity development, and lead more purposeful lives.

Besides, the results indicate that this research revealed how these attributes influence cultural identity development through critical thinking, cultural intelligence, and eudaimonia well-being. By organizing and interpreting personal experiences, the qualitative analysis in Study 2 effectively explores the complex map encompassing identity development, psychological well-being, critical thinking, and cultural intelligence. Together with the quantitative analysis, qualitative analysis offers a multidimensional view of well-being. Participants who exhibit high levels of eudaimonic well-being may demonstrate a harmonious integration of self-construction and self-discovery. These individuals may experience a profound sense of purpose and fulfillment grounded in a deep understanding of their identity. Psychological well-being encompasses sociality, reasoning, friendship, justice, good governance, practical wisdom, scientific knowledge, and contemplative wisdom (Fowers, 2016). Some scholars propose that happiness is influenced by three factors: set point, contextual factors, and intentional activities, with environmental factors also playing a role in individual well-being (Diener et al., 2003; Sheldon and Lyubomirsky, 2004). However, Waterman (2008) claims that psychological well-being is not limited to specific individuals but accessible to all. Modern eudaimonist philosophy adopts a broader perspective than Aristotle, which includes subjective components in defining eudaimonia. The subjective initiative is achieved through efforts to develop skills and talents and pursue worthwhile goals in life. Although individuals' subjective initiative might be affected by external factors, attaining well-being through personal growth is also possible.

Being self is a challenging task in life's journey. Psychological well-being theories provide us a critical perspective for an essential question of that journey: What kind of self should we be? Ryff's (1989, 2014) multidimensional model emphasizes the significance of self-acceptance, positive relations, autonomy, environmental mastery, life purpose, and personal growth. In this research, cultural identity serves as a lens through which these dimensions are shaped. Furthermore, based on the eudaimonic identity theory, Waterman and Schwartz (2024) further develop the Integrative Theory of Intrinsic Motivation, which is constructed personal characteristics with self-determination, balance of challenges and skills, self-realization values, and engaged performance. These four

characteristics encompass essential activities that aid in overcoming obstacles and challenges related to identity development: selection, evaluation, and ambition (Waterman and Schwartz, 2024). From this perspective, individuals who value critical thinking and cultural intelligence will intentionally achieve psychological well-being through purposeful practice, cultivation, and reflection. The findings of this research serve as a source of inspiration for us to thrive and lead fulfilling lives, echoing the sentiment expressed by the esteemed Chinese artist Li Shutong: “见天地,见众生,见自己,” which can be interpreted as “understanding the world, empathizing with others, and introspecting on oneself.”

6 Limitation and future work

This research explores the intricate relationship between critical thinking beliefs, cultural intelligence, and psychological well-being within the context of cultural identity development. While the study provides valuable insights into the experiences of Chinese students, there is a need for ongoing research that continues to explore the intersection of culture, education, and student outcomes. In future research, it will be essential to address several limitations to enhance further our understanding of the relationship between critical thinking beliefs, cultural intelligence, and psychological well-being within cultural identity development. Firstly, longitudinal studies should be considered in future studies. Tracking participants' development across various life stages and cultural contexts could illuminate the long-term effects of critical thinking and cultural intelligence on identity formation and psychological well-being. Secondly, the diversity of the sample in the current study may only partially represent a part of the population. The samples only comprised Chinese arts students, and this limitation of the cross-subjects and cross-cultures impacted the generalizability of the findings. Future research should include more diverse populations across different cultural backgrounds and academic disciplines to provide a comprehensive understanding of the relationship between critical thinking, cultural intelligence, and psychological well-being. Thirdly, the current study primarily focused on individual-level factors. Future research could explore how societal or institutional factors influence critical thinking, cultural intelligence, and well-being on a broader scale. By addressing these limitations, future research can contribute to exploring personal growth and fulfillment across diverse cultural contexts.

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 humans were approved by the Guangzhou Academy of Fine Arts Ethics Committee (KXLL2024001; Project Name: Integration and Implementation of ‘The Governance of China’ by Xi Jinping (English Version) in College Freshman English Courses). 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

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References

- Albuquerque, I., de Lima, M. P., Matos, M., and Figueiredo, C. (2012). Personality and subjective well-being: what hides behind global analyses? *Soc. Indic. Res.* 105, 447–460. doi: 10.1007/s11205-010-9780-7
- Alexandra, V. (2022). ‘Optimizing cultural intelligence development by considering different types of change,’ *the. Int. J. Hum. Resour. Manag.* 34, 2404–2428. doi: 10.1080/09585192.2022.2081060
- Aloia, L. S., and Brecht, D. (2017). Psychological well-being as a function of affectionate communication and emotional intelligence. *Commun. Res. Rep.* 34, 297–306. doi: 10.1080/08824096.2017.1350570
- Alshakhsi, S., Chemnad, K., Almourad, M. B., Altuwairiqi, M., McAlaney, J., and Ali, R. (2022). Problematic internet usage: the impact of objectively recorded and categorized usage time, emotional intelligence components and subjective happiness about usage. *Heliyon* 8:e11055. doi: 10.1016/j.heliyon.2022.e11055
- Ang, S., Tan, M. L., and Van Dyne, L. (2011). “Cultural Intelligence” in *The Cambridge handbook of intelligence*. eds. S. B. Kaufman and R. J. Sternberg (Cambridge: Cambridge University Press), 582–602.
- Ang, S., van Dyne, L., Koh, C., Ng, K. Y., Templer, K. J., Tay, C., et al. (2007). Cultural intelligence: its measurement and effects on cultural judgment and decision making, cultural adaptation and task performance. *Manag. Organ. Rev.* 3, 335–371. doi: 10.1111/j.1740-8784.2007.00082.x
- Arneaud, M. J., Alea, N., and Espinet, M. (2016). Identity development in Trinidad: status differences by age, adulthood transitions, and culture. *Identity* 16, 59–71. doi: 10.1080/15283488.2015.1121818
- Asser, M., and Langbein-Park, A. (2015). “Cultural Intelligence” in *The sage encyclopedia of intercultural competence*. ed. J. M. Bennett (London, UK: Sage), 192–199.
- Barnett, R. (2021). *The philosophy of higher education: A critical introduction*. 1st Edn. London: Routledge.
- Barthelmäs, M., and Keller, J. (2021). Adult emotional crying: relations to personality traits and subjective well-being. *Personal. Individ. Differ.* 177:110790. doi: 10.1016/j.paid.2021.110790
- Bernardo, A. B. I., and Presbitero, A. (2018). Cognitive flexibility and cultural intelligence: exploring the cognitive aspects of effective functioning in culturally diverse contexts. *Int. J. Intercult. Relat.* 66, 12–21. doi: 10.1016/j.ijintrel.2018.06.001
- Bhabha, H. K. (1990). “The third space” in *Identity: Community, culture, difference*. ed. J. Rutherford (London: Lawrence & Wishart).
- Bhullar, N., Schutte, N. S., and Malouff, J. M. (2013). The nature of well-being: the roles of hedonic and Eudaimonic processes and trait emotional intelligence. *J. Psychol.* 147, 1–16. doi: 10.1080/00223980.2012.667016
- Boskey, E. R. (2014). Understanding transgender identity development in childhood and adolescence. *Amer. J. Sex. Educ.* 9, 445–463. doi: 10.1080/15546128.2014.973131
- Byram, M. (2012). Language awareness and (critical) cultural awareness – relationships, comparisons and contrasts. *Lang. Aware.* 21, 5–13. doi: 10.1080/09658416.2011.639887
- Byram, M. (2021). Teaching and assessing intercultural communicative competence. UK, Multilingual Matters (Revisited). 45–47.
- Castelló, I., Barberá-Tomás, D., and Vaara, E. (2023). Moving on: narrative identity reconstruction after entrepreneurial failure. *J. Bus. Ventur.* 38:106302. doi: 10.1016/j.jbusvent.2023.106302
- Charmaz, K. (2014). *Constructing grounded theory: A practical guide through qualitative analysis*. 2nd Edn. Thousand Oaks, CA: Sage.
- Chédru, M., and Ostapchuk, M. (2023). The effect of study abroad and personality on cultural intelligence: a deeper understanding using the expanded model of cultural intelligence. *Int. J. Intercult. Relat.* 92:101737. doi: 10.1016/j.ijintrel.2022.11.001
- Cheung, C., Tung, V., and Goopio, J. (2022). Maximizing study abroad learning outcomes through cultural intelligence and emotional intelligence development. *Hospital. Leisure Sport Tour. Educ. COVID-19 Disrupt.* 30:100359. doi: 10.1016/j.jhlste.2021.100359
- Côté, J. E. (2015). “Identity Formation Research from a Critical Perspective: Is a Social Science Developing?,” in *The Oxford Handbook of Identity Development*. eds. K. C. McLean and M. Syed. New York: Oxford University Press. 527–538.
- Dacey, J. S., Fiore, L. B., and Brion-Meisels, S. (2016). Practicing mindfulness. *Your Child’s Soci. Emot. Well Being*, 37–51. doi: 10.1002/9781118976227.ch3
- Daniel, S., and Sabbagh, C. (2022). “Intercultural exposure and global citizenship attitudes among affluent late adolescents: cultural intelligence as mediator,” *Globalisation, Societies and Education*, 1–18. doi: 10.1080/14767724.2022.2114072
- Darvishmotevali, M., Altinay, L., and De Vita, G. (2018). Emotional intelligence and creative performance: looking through the lens of environmental uncertainty and cultural intelligence. *Int. J. Hosp. Manag.* 73, 44–54. doi: 10.1016/j.ijhm.2018.01.014
- Davaei, M., Gunkel, M., Veglio, V., and Taras, V. (2022). The influence of cultural intelligence and emotional intelligence on conflict occurrence and performance in global virtual teams. *J. Int. Manag.* 28:100969. doi: 10.1016/j.intman.2022.100969
- Diener, E., Oishi, S., and Lucas, R. E. (2003). Personality, culture, and subjective well-being: emotional and cognitive evaluations of life. *Annu. Rev. Psychol.* 54, 403–425. doi: 10.1146/annurev.psych.54.101601.145056
- Dolce, V., Davoine, É., Wodociag, S., and Ghislieri, C. (2023). The road to an international career: the “Erasmus effect” on resilience, intercultural interactions and cultural intelligence. *Int. J. Intercult. Relat.* 92:101741. doi: 10.1016/j.ijintrel.2022.101741
- du Plessis, J., and Naudé, L. (2017). “Carrying the culture...”: ethnic identity development in black African adolescents. *J. Psychol. Afr.* 27, 159–164. doi: 10.1080/14330237.2017.1303106
- Duerden, M. D., Widmer, M. A., Taniguchi, S. T., and McCoy, J. K. (2009). Adventures in identity development: the impact of adventure recreation on adolescent identity development. *Identity* 9, 341–359. doi: 10.1080/15283480903422806
- Dwyer, C. P. (2017). “Critical thinking in real-world settings” in *Critical thinking: Conceptual perspectives and practical guidelines* (Cambridge: Cambridge University Press), 143–228.
- Erikson, E. H., (1959). Identity and the life cycle: selected papers. *Psychol.* 1, 1–171.
- Eriksson, P. L., and Frisén, A. (2024). Facing challenging experiences in life – narrative identity development processes and associations with wellbeing during the transition to midlife. *Identity* 24, 16–30. doi: 10.1080/15283488.2023.2258152
- Eriksson, P. L., McLean, K. C., and Frisén, A. (2020). Ta Det Onda med Det Goda (accepting the bad that comes with the good) - a cultural framework for identity narratives of difficult experiences in Sweden. *Identity* 20, 157–169. doi: 10.1080/15283488.2020.1781636
- Etzebarria, I., Etzebarria, I., and Urdaneta, E. (2019). Subjective well-being among the oldest old: the role of personality traits. *Personal. Individ. Differ.* 146, 209–216. doi: 10.1016/j.paid.2018.04.042
- Fan, L., Chatterjee, S., and Kim, J. (2022). Young adults’ personality traits and subjective well-being: the role of perceived money management capability. *J. Behav. Exp. Financ.* 35:100689. doi: 10.1016/j.jbef.2022.100689

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- Fang, F., Schei, V., and Selart, M. (2018). Hype or hope? A new look at the research on cultural 1087 intelligence. *J. Intercol. Relat.* 66, 148–171. doi: 10.1016/j.ijintrel.2018.04.002
- Ford, B. Q., Dmitrieva, J. O., Heller, D., Chentsova-Dutton, Y., Grossmann, I., Tamir, M., et al. (2015). Culture shapes whether the pursuit of happiness predicts higher or lower well-being. *J. Exp. Psychol. Gen.* 144, 1053–1062. doi: 10.1037/xge0000108
- Fowers, B. J. (2016). “Aristotle on Eudaimonia: on the virtue of returning to the source” in *Handbook of Eudaimonic well-being*. ed. J. Vittersø (Cham: Springer International Publishing), 67–83.
- Freud, S. (1961). “The ego and the id” in *The standard edition of the complete psychological works of Sigmund Freud*. ed. J. Strachey, vol. 5 (London, England: Hogarth Press), 656–154.
- Funder, D. C., and Ozer, D. J. (2019). Evaluating effect size in psychological research: sense and nonsense. *Adv. Methods Pract. Psychol. Sci.* 2, 156–168. doi: 10.1177/2515245919847202
- Gamsakhurdia, V. L. (2019). Proculturation: self-reconstruction by making “fusion cocktails” of alien and familiar meanings. *Cult. Psychol.* 25, 161–177. doi: 10.1177/1354067X19829020
- Gamsakhurdia, V. L. (2022). “Considering the systemic and culturally sensitive model of the self-structure” in *A theory of Proculturation: Development of the self through intercultural communication*. ed. V. L. Gamsakhurdia (Cham: Springer International Publishing), 17–29.
- Germain, E. R. (2004). Culture or race? Phenotype and cultural identity development in minority Australian adolescents. *Aust. Psychol.* 39, 134–142. doi: 10.1080/00050060410001701852
- Gilberto, J. M., Davenport, M. K., and Beier, M. E. (2020). Personality, health, wealth, and subjective well-being: testing an integrative model with retired and working older adults. *J. Res. Pers.* 87:103959. doi: 10.1016/j.jrp.2020.103959
- Green, C., Kalvaitis, D., and Worster, A. (2016). Recontextualizing psychosocial development in young children: a model of environmental identity development. *Environ. Educ. Res.* 22, 1025–1048. doi: 10.1080/13504622.2015.1072136
- Halpern, D. F. (2014). *Thought and knowledge: An introduction to critical thinking*. 5th Edn. New York: Psychology Press.
- Harzer, C. (2016). “The Eudaimonics of human strengths: the relations between character strengths and well-being” in *Handbook of Eudaimonic well-being*. ed. J. Vittersø (Cham: Springer International Publishing), 307–322.
- Haybron, D. M. (2000). Two philosophical problems in the study of happiness. *J. Happiness Stud.* 1, 207–225. doi: 10.1023/A:1010075527517
- Haybron, D. M. (2016). “The philosophical basis of Eudaimonic psychology” in *Handbook of Eudaimonic well-being*. ed. J. Vittersø (Cham: Springer International Publishing), 27–53.
- Holland, A., Dooley, G., Fedock, B., Ferebee, S., and Bailey, L. (2017). Meditation, mindfulness, and critical thinking: individual characteristics in online higher education. *J. Psychol. Cogn.* 2, 170–176. doi: 10.35841/psychology-cognition.2.3.170-176
- Holliday, A. (2011). *Intercultural Communication and Ideology*. SAGE: London. 222.
- Iskhakova, M., Bradley, A., Whiting, B., and Lu, V. N. (2022). Cultural intelligence development during short-term study abroad programmes: the role of cultural distance and prior international experience. *Stud. High. Educ.* 47, 1694–1711. doi: 10.1080/03075079.2021.1957811
- Kahneman, D. (2011). *Thinking, fast and slow*. New York: Farrar, Strauss, Girou.
- Kohút, M., Šrol, J., and Čavojská, V. (2022). How are you holding up? Personality, cognitive and social predictors of a perceived shift in subjective well-being during COVID-19 pandemic. *Personal. Individ. Differ.* 186:111349. doi: 10.1016/j.paid.2021.111349
- Kunchambo, V., Lee, C. K. C., and Brace-Govan, J. (2021). Cultivating nature identity and ecological worldviews: a pathway to Alter the prevailing dominant social paradigm. *J. Macromark.* 41, 484–505. doi: 10.1177/0276146721997540
- Lam, R., Cheung, C., and Lugosi, P. (2021). The impacts of cultural and emotional intelligence on hotel guest satisfaction: Asian and non-Asian perceptions of staff capabilities. *J. China Tour. Res.* 17, 455–477. doi: 10.1080/19388160.2020.1771500
- Le Moglie, M., Mencarini, L., and Rapallini, C. (2015). Is it just a matter of personality? On the role of subjective well-being in childbearing behavior. *J. Econ. Behav. Organ.* 117, 453–475. doi: 10.1016/j.jebo.2015.07.006
- Li, M. (2020). An examination of two major constructs of cross-cultural competence: cultural intelligence and intercultural competence. *Personal. Individ. Differ.* 164:110105. doi: 10.1016/j.paid.2020.110105
- Lin, Y., Chen, A. S., and Song, Y. (2012). Does your intelligence help to survive in a foreign jungle? The effects of cultural intelligence and emotional intelligence on cross-cultural adjustment. *Int. J. Intercult. Relat.* 36, 541–552. doi: 10.1016/j.ijintrel.2012.03.001
- Mancini, G., Özal, Z., Biolcati, R., Trombini, E., and Petrides, K. V. (2024). Trait emotional intelligence and adolescent psychological well-being: a systematic review. *Int. J. Adolesc. Youth* 29:2292057. doi: 10.1080/02673843.2023.2292057
- Marcia, J. E. (2002). Identity and psychosocial development in adulthood. *Identity* 2, 7–28. doi: 10.1207/S1532706XID0201_02
- Martínez-marín, M. D., and Martínez, C. (2019). Subjective well-being and gender-typed attributes in adolescents: the relevance of emotional intelligence. *Aust. J. Psychol.* 71, 296–304. doi: 10.1111/ajpy.12247
- Martínez-Marín, M.-D., and Martínez, C. (2022). Exploring subjective well-being through gender and emotional intelligence. A mediational model (Explorando el bienestar subjetivo a través del género y la inteligencia emocional. Un modelo mediacional). *Stud. Psychol.* 43, 358–388. doi: 10.1080/02109395.2022.2056801
- McAdams, D. P. (2013). The psychological self as actor, agent, and author. *Perspect. Psychol. Sci.* 8, 272–295. doi: 10.1177/1745691612464657
- McAdams, D. P., and Zapata-Gietl, C. (2015). “Three Strands of Identity Development Across the Human Life Course: Reading Erik Erikson in Full,” in *The Oxford Handbook of Identity Development*. eds. K. C. McLean and M. Syed (New York: Oxford University Press. 81–94.
- McKay, S., Lannegrand, L., Skues, J., and Wise, L. (2022). International experience and cultural intelligence development: a longitudinal assessment of Australian and French exchange students. *Int. J. Intercult. Relat.* 91, 56–69. doi: 10.1016/j.ijintrel.2022.08.009
- Moran, C. D. (2009). Conceptualizing identity development: unmasking the assumptions within inventories measuring identity development. *NASPA J.* 46, 469–481. doi: 10.2202/1949-6605.5021
- Moran, S. (2020). “How practicing our purpose aim contributes to a cultural common good, and vice versa” in *The ecology of purposeful living across the lifespan: Developmental, educational, and social perspectives*. eds. A. L. Burrow and P. L. Hill (Cham: Springer International Publishing), 199–232.
- Mrazek, A. J., Harada, T., and Chiao, J. Y. (2015). “Cultural neuroscience of identity development” in *The Oxford handbook of identity development*. eds. K. C. McLean and M. Syed (New York: Oxford University Press), 423–436.
- Musarra, G., Kadile, V., Zaefarian, G., Oghazi, P., and Najafi-Tavani, Z. (2022). Emotions, cultural intelligence, and mutual trust in technology business relationships. *Technol. Forecast. Soc. Chang.* 181:121770. doi: 10.1016/j.techfore.2022.121770
- Mussone, L., and Changizi, F. (2023). The relationship between subjective well-being and individual characteristics, personality traits, and choice of transport mode during the first lockdown in Milan, Italy. *J. Transp. Health* 30:101600. doi: 10.1016/j.jth.2023.101600
- Nguyen, H., Cohen, E., and Hines, A. (2012). Brief report: do peer relationships matter to Vietnamese adolescents’ and young adults’ development of identity? Towards a working theory of identity development in a changing culture. *Intersect. Identity Dev. Processes Peer Relationship Exp.* 35, 1501–1504. doi: 10.1016/j.adolescence.2011.11.008
- Ott, D. L., and Iskhakova, M. (2019). The meaning of international experience for the development of cultural intelligence: a review and critique. *Crit. Perspect. Int. Bus.* 15, 390–407. doi: 10.1108/cpoib-05-2019-0036
- Oxford, R. L. (2018). “EMPATHICS: a complex dynamic systems (CDS) vision of language learner well-being” in *The TESOL encyclopedia of English language teaching*. ed. J. I. Lontos. 1st ed. (New Jersey: Wiley), 1–9.
- Peng, Y. (2023). Understanding the cultural identity of EFL learners from the eco-linguistics perspective: evidence from students in arts college before and after the COVID-19 epidemic period. *Front. Psychol.* 14:1249334. doi: 10.3389/fpsyg.2023.1249334
- Pidduck, R. J., Shaffer, M. A., Zhang, Y., Cheung, S. S. Y., and Yunlu, D. G. (2022). Cultural intelligence: an identity lens on the influence of cross-cultural experience. *J. Int. Manag.* 28:100928. doi: 10.1016/j.intman.2022.100928
- Pnevmatikos, D., Geka, M., and Divane, M. (2010). The emergence, structure and development of ethnic identity during childhood: the case of Roma identity. *Int. J. Psychol.* 45, 435–442. doi: 10.1080/00207594.2010.491120
- Presbitero, A. (2020). Foreign language skill, anxiety, cultural intelligence and individual task performance in global virtual teams: a cognitive perspective. *J. Int. Manag.* 26:100729. doi: 10.1016/j.intman.2019.100729
- Renn, K. A. (2020). The influence of peer culture on identity development in college students. *J. Coll. Charact.* 21, 237–243. doi: 10.1080/2194587X.2020.1822879
- Ryan, R. M., and Deci, E. L. (2001). On happiness and human potentials: a review of research on hedonic and Eudaimonic well-being. *Annu. Rev. Psychol.* 52, 141–166. doi: 10.1146/annurev.psych.52.1.141
- Ryff, C. D. (1989). Happiness is everything, or is it? Explorations on the meaning of psychological well-being. *J. Pers. Soc. Psychol.* 57, 1069–1081. doi: 10.1037/0022-3514.57.6.1069
- Ryff, C. D. (2014). Psychological well-being revisited: advances in the science and practice of Eudaimonia. *Psychother. Psychosom.* 83, 10–28. doi: 10.1159/000353263
- Ryff, C. D. (2022). Positive psychology: looking Back and looking forward. *Front. Psychol.* 13:840062. doi: 10.3389/fpsyg.2022.840062
- Ryff, C. D. (2023a). “In pursuit of Eudaimonia: past advances and future directions” in *Human flourishing*. eds. M. Las Heras, M. Grau Grau and Y. Rofcanin (Cham: Springer International Publishing), 9–31.
- Ryff, C. D. (2023b). Meaning-making in the face of intersecting catastrophes: COVID-19 and the plague of inequality. *J. Constr. Psychol.* 36, 185–203. doi: 10.1080/10720537.2022.2068707

- Ryff, C. D., and Singer, B. H. (2008). Know thyself and become what you are: a Eudaimonic approach to psychological well-being. *J. Happiness Stud.* 9, 13–39. doi: 10.1007/s10902-006-9019-0
- Saldaña, J. (2016). *The coding manual for qualitative researchers*. London and Thousand Oaks, CA: Sage.
- Sánchez-Álvarez, N., Extremera, N., and Fernández-Berrocal, P. (2016). The relation between emotional intelligence and subjective well-being: a meta-analytic investigation. *J. Posit. Psychol.* 11, 276–285. doi: 10.1080/17439760.2015.1058968
- Schneider, L., Matic, A., Buda, T. S., and Dolan, P. (2024). Me, my thoughts and I – personality as a moderator of the effect of thoughts on subjective well-being. *Personal. Individ. Differ.* 222:112584. doi: 10.1016/j.paid.2024.112584
- Schaetti, B. F. (2015). Identity. In *The SAGE Encyclopedia of Intercultural Competence*. ed. J. M. Bennett. London: Sage. 405–410.
- Schutte, N. S., and Malouff, J. M. (2011). Emotional intelligence mediates the relationship between mindfulness and subjective well-being. *Special Issue Anx.* 50, 1116–1119. doi: 10.1016/j.paid.2011.01.037
- Sharif, S., and Channa, L. A. (2022). Lived narratives: female investment and identity negotiation in learning English in rural Pakistan. *Linguist. Educ.* 72:101119. doi: 10.1016/j.linged.2022.101119
- Sheldon, K. M., and Lyubomirsky, S. (2004). “Achieving sustainable new happiness: prospects, practices, and prescriptions” in *Positive psychology in practice* (Hoboken, NJ, US: John Wiley & Sons, Inc), 127–145.
- Skaria, R., and Montayre, J. (2023). Cultural intelligence and intercultural effectiveness among nurse educators: a mixed-method study. *Nurse Educ. Today* 121:105714. doi: 10.1016/j.nedt.2023.105714
- Squires, V. (2023). “Thematic analysis” in *Varieties of qualitative research methods: Selected contextual perspectives*. eds. J. M. Okoko, S. Tunison and K. D. Walker (Cham: Springer International Publishing), 463–468.
- Stead, H., and Bibby, P. A. (2017). Personality, fear of missing out and problematic internet use and their relationship to subjective well-being. *Comput. Hum. Behav.* 76, 534–540. doi: 10.1016/j.chb.2017.08.016
- Steger, M. F., Kashdan, T. B., and Oishi, S. (2008). Being good by doing good: daily eudaimonic activity and well-being. *J. Res. Pers.* 42, 22–42. doi: 10.1016/j.jrp.2007.03.004
- Sternberg, R. J. (1997). The concept of intelligence and its role in lifelong learning and success. *Am. Psychol.* 52, 1030–1037. doi: 10.1037/0003-066X.52.10.1030
- Sternberg, R. J., Siriner, I., Oh, J., and Wong, C. H. (2022). Cultural intelligence: what is it and how can it effectively be measured? *J. Intelligence* 10:54. doi: 10.3390/jintelligence10030054
- Stetz, L. (2023). Artists narratives across culture: globally mapping violence against women. *J. Radiol. Nurs.* 42, 191–199. doi: 10.1016/j.jradnu.2023.02.011
- Stuppel, E. J. N., Maratos, F. A., Elander, J., Hunt, T. E., Cheung, K. Y. F., and Aubeeluck, A. V. (2017). Development of the critical thinking toolkit (CriTT): a measure of student attitudes and beliefs about critical thinking. *Think. Skills Creat.* 23, 91–100. doi: 10.1016/j.tsc.2016.11.007
- Suthatarn, P., and Charoensukmongkol, P. (2018). Cultural intelligence and airline cabin crews members’ anxiety: the mediating roles of intercultural communication competence and service attentiveness. *J. Hum. Resour. Hosp. Tour.* 17, 423–444. doi: 10.1080/15332845.2018.1449559
- Syed, M., and McLean, K. C. (2022). Who gets to live the good life? Master narratives, identity, and well-being within a marginalizing society. *J. Res. Pers.* 100:104285. doi: 10.1016/j.jrp.2022.104285
- Thomas, D. C., Liao, Y., Aycan, Z., Cerdin, J. L., Pekerti, A. A., Ravlin, E. C., et al. (2015). Cultural intelligence: a theory-based, short form measure. *J. Int. Bus. Stud.* 46, 1099–1118. doi: 10.1057/jibs.2014.67
- Ting-Toomey, S. (2015). Identity negotiation theory. *Int. Encycl. Interpersonal Commun.* ed. Y. Y. Kim (New York: John Wiley & Sons), 1–10.
- Vanaken, L., Bijttebier, P., Fivush, R., and Hermans, D. (2022). Narrative coherence predicts emotional well-being during the COVID-19 pandemic: a two-year longitudinal study. *Cognit. Emot.* 36, 70–81. doi: 10.1080/02699931.2021.1902283
- Vergara, A. I., Alonso-alberca, N., San-juan, C., Aldás, J., and Vozmediano, L. (2015). Be water: direct and indirect relations between perceived emotional intelligence and subjective well-being. *Aust. J. Psychol.* 67, 47–54. doi: 10.1111/ajpy.12065
- Vittersø, J. (2016). “The Most important idea in the world: an introduction” in *Handbook of Eudaimonic well-being*. ed. J. Vittersø (Cham: Springer International Publishing), 1–24.
- Walters, K. A., and Auton-Cuff, F. P. (2009). A story to tell: the identity development of women growing up as third culture kids. *Mental Health Relig. Cult.* 12, 755–772. doi: 10.1080/13674670903029153
- Wang, C. (2021). “How much can our universities do in the development of cultural intelligence? A cross-sectional study among health care students,” *Nurse Education Today*, 103:104956. doi: 10.1016/j.nedt.2021.104956
- Waterman, A. S. (1984). Identity formation: discovery or creation? *J. Early Adolesc.* 4, 329–341. doi: 10.1177/0272431684044004
- Waterman, A. S. (1993). Two conceptions of happiness: contrasts of personal expressiveness (eudaimonia) and hedonic enjoyment. *J. Pers. Soc. Psychol.* 64, 678–691. doi: 10.1037/0022-3514.64.4.678
- Waterman, A. S. (2004). Finding someone to be: studies on the role of intrinsic motivation in identity formation. *Identity* 4, 209–228. doi: 10.1207/s1532706xido403_1
- Waterman, A. S. (2008). Reconsidering happiness: a eudaimonist’s perspective. *J. Posit. Psychol.* 3, 234–252. doi: 10.1080/17439760802303002
- Waterman, A. S. (2011). “Eudaimonic identity theory: identity as self-discovery” in *Handbook of identity theory and research*. eds. S. J. Schwartz, K. Luyckx and V. L. Vignoles (Springer New York: New York, NY), 357–379.
- Waterman, A. S., and Schwartz, S. J. (2024). Identity contributions to a life well-lived: a study of the relationship of Eudaimonic well-being to intrinsic motivation for identity-related activities. *Identity* 24, 1–15. doi: 10.1080/15283488.2023.2233990
- Waterman, A. S., Schwartz, S. J., and Conti, R. (2024). Resolving the paradox of work: generalization of the roles of self-determination, the balance of challenges and skills, and self-realization values in intrinsic motivation across activity domains. *J. Posit. Psychol.* 19, 356–368. doi: 10.1080/17439760.2023.2179936
- Waterman, A. S., Schwartz, S. J., Zamboanga, B. L., Ravert, R. D., Williams, M. K., Bede Agocha, V., et al. (2010). The questionnaire for Eudaimonic well-being: psychometric properties, demographic comparisons, and evidence of validity. *J. Posit. Psychol.* 5, 41–61. doi: 10.1080/17439760903435208
- Wolff, F., Wickord, L. C., Rahe, M., and Quaiser-Pohl, C. M. (2023). Effects of an intercultural seminar using telepresence robots on students’ cultural intelligence. *Comp. Educ.* 2:100007. doi: 10.1016/j.cexr.2023.100007



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Sonia Salvo-Garrido,
University of La Frontera, Chile

*CORRESPONDENCE

Hu Chunyan
✉ Cindy_Hu202308@126.com

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Proactive personality, burnout, and teaching enjoyment: exploring relationships in Chinese English teachers

Hu Chunyan^{1*} and Liao Ying²

¹Primary Education Department, Chongqing Preschool Education College, Chongqing, China,

²School of Foreign Languages, Southwest Petroleum University, Chengdu, China

Introduction: This study examines the relationships between proactive personality, burnout, and teaching enjoyment among Chinese English as a Foreign Language (EFL) teachers. The research aims to clarify how proactive personality traits relate to teaching enjoyment and burnout and to explore their interactions in the context of EFL instruction.

Methods: The study included a sample of 420 Chinese EFL teachers, and Structural Equation Modeling (SEM) was used to assess the relationships among proactive personality, burnout, and teaching enjoyment. Data underwent detailed statistical analysis to identify both direct and mediating effects within the proposed model.

Results: The findings from the SEM analysis revealed significant direct relationships between proactive personality, burnout, and teaching enjoyment among Chinese EFL educators. Proactive personality was associated with a decrease in burnout ($\beta = -0.366$, $SE = 0.159$, $p < 0.001$). For every unit increase in proactive personality, teachers reported experiencing higher levels of teaching enjoyment ($\beta = 0.487$, $SE = 0.176$, $p < 0.001$). Teaching enjoyment, in turn, was a significant mediator in the relationship between proactive personality and burnout ($\beta = -0.249$, $SE = 0.102$, $p < 0.001$). These findings suggest that proactive personality is positively associated with teaching enjoyment, which, in turn, may relate to lower levels of burnout among EFL teachers.

Discussion: This study highlights the importance of proactive personality traits in enhancing teaching enjoyment and reducing burnout among Chinese EFL teachers. The findings emphasize how proactive tendencies contribute to teachers' well-being, professional satisfaction, and, ultimately, the quality of EFL instruction. These results suggest practical applications, such as developing interventions that encourage proactive traits and increase teaching enjoyment among EFL educators, which may improve the educational experience for EFL students.

KEYWORDS

proactive personality, burnout, teaching enjoyment, English as a foreign language, Chinese educators

Introduction

The teaching profession is essential to society, influencing the knowledge, values, and character of future generations. Educators carry substantial responsibilities, motivated by commitment and passion. However, teaching also brings challenges, with high job-related stress and burnout remaining significant concerns (Chang, 2009; Chen, 2023; Chen et al., 2023; Shen et al., 2015). Burnout not only affects teachers' well-being but can also reduce the quality of education and negatively impact students (Brady et al., 2023; Cheng et al., 2023; Oliveira et al., 2021; Skaalvik and Skaalvik, 2017).

Identifying factors that enhance teacher motivation and well-being is essential for creating a sustainable educational environment. Self-determination theory (SDT) provides a useful framework for understanding these influences. SDT distinguishes between intrinsic motivation—stemming from genuine interest and enjoyment—and extrinsic motivation, which is driven by external incentives (Deci and Ryan, 2000; Ryan and Deci, 2000). Intrinsic motivation is linked to greater persistence, creativity, and well-being. Encouraging intrinsic motivation in educators may positively affect teaching enjoyment and help mitigate burnout.

Research increasingly explores how individual differences and personal traits shape the experience of teacher burnout, given its complex nature (Chen, 2023; Chen et al., 2023; Madigan and Kim, 2021). Proactive personality, a trait marked by self-initiative at work, is one such characteristic attracting scholarly attention (Bateman and Crant, 1993; Fuller and Marler, 2009; Wang et al., 2021). Educators with a proactive disposition tend to take initiative, pursue professional development, and actively engage in problem-solving (Wang et al., 2021). They are more inclined to set goals, seek achievements, and shape their work environments to better align with their aspirations (Dai and Wang, 2023; Grant and Ashford, 2008; Maan et al., 2020). The potential link between proactive personality and teacher burnout is intriguing, suggesting that proactive teachers may display greater resilience and adaptability in managing the demands and challenges of teaching (Kong et al., 2021; Pietarinen et al., 2021). However, despite the appeal of this connection, the mechanisms through which proactive personality affects burnout remain largely underexamined.

Teaching enjoyment is a key emotional factor influencing educators' job satisfaction and well-being (Ergün and Dewaele, 2021; Frenzel et al., 2016; Skaalvik and Skaalvik, 2017). Educators who find joy in their work often report higher satisfaction, motivation, and a stronger emotional connection to their roles (Frondozo et al., 2020; Schaufeli et al., 2006). Yet, the factors contributing to teaching enjoyment and its potential role in mitigating burnout warrant further investigation.

This study examines how proactive personality influences teacher burnout, focusing on the mediating role of teaching enjoyment. We hypothesize that proactive personality, defined by an engaged and self-initiated work approach, enhances teaching enjoyment, which in turn may help mitigate burnout. Insights from this research hold practical implications for educators, institutions, and policymakers, offering guidance for strategies in teacher development, recruitment, and support that could improve educators' well-being and educational outcomes. By exploring these relationships, the study contributes to ongoing efforts to improve teachers' working conditions—a goal with direct benefits for both students and the broader educational system. While cross-sectional studies provide valuable information about

associations between variables at a single time point, they do not establish causality. Thus, while this study identifies correlations among proactive personality, teaching enjoyment, and burnout in Chinese EFL teachers, future longitudinal studies are needed to confirm potential causal pathways.

Review of the literature

Teacher burnout

Teacher burnout, as defined by Iancu et al. (2018), is a pervasive and intricate psychological response arising from persistent occupational stressors within the field of education. This phenomenon is characterized by a triad of emotional exhaustion, depersonalization, and a diminished sense of personal accomplishment (Cano-García et al., 2005; Maslach et al., 1997). Emotional exhaustion involves feelings of being emotionally drained and depleted, often accompanied by physical and psychological fatigue. Depersonalization manifests as negative, cynical attitudes and behaviors toward students and colleagues, leading to emotional detachment. Reduced personal accomplishment denotes a decline in competence and achievement within the educator's role (Maslach and Leiter, 2008). Burnout, considered a syndrome, significantly impacts individuals both emotionally and physically, ultimately impairing their effectiveness in the workplace (Maslach et al., 2001; Skaalvik and Skaalvik, 2007).

The concept of burnout initially surfaced in the early 1970s when Freudenberger (1974) introduced it within human service professions. Since then, it has been extensively studied and adapted to various occupational settings, particularly within education. Maslach and Jackson (1981) specifically conceptualized teacher burnout in the late 1970s, leading to the development of widely utilized assessment tools like the Maslach Burnout Inventory (MBI) to measure teacher burnout (Maslach et al., 1997).

The significance of teacher burnout within the educational landscape cannot be overstated, given its multifaceted impact on educators, students, and the broader educational system. Grayson and Alvarez (2008) highlighted its profound negative effects on educators' physical and mental health, job satisfaction, and retention in the profession. Teachers experiencing burnout face increased susceptibility to stress-related health issues, such as depression and anxiety (Hakanen and Schaufeli, 2012; Zhao et al., 2023), contributing to higher rates of considering leaving the profession (Ingersoll and Strong, 2011). The resulting high turnover not only disrupts educational continuity but also incurs substantial financial and organizational costs for schools and districts (Molero Jurado et al., 2019). Moreover, teacher burnout detrimentally influences students' learning and well-being. Emotionally exhausted and detached educators provide less effective instruction, leading to lower academic achievement and decreased student engagement (Johnson et al., 2012). Additionally, Saloviita and Pakarinen (2021) pointed out that students can perceive and be adversely affected by teachers' emotional and attitudinal shifts, creating a less supportive and motivating learning environment.

At a systemic level, high levels of teacher burnout pose considerable challenges for the educational system (Stein et al., 2024). Schools and districts struggle to attract and retain talented educators, resulting in shortages of qualified teachers (Grayson and

Alvarez, 2008). The associated costs of recruiting and training replacements for those leaving due to burnout are substantial (Ingersoll and May, 2012; Yang and Ling, 2023), potentially compromising the overall quality and efficacy of educational institutions (Nagy, 2017). Recognizing the gravity of this issue, educational institutions and policymakers have increasingly focused on implementing preventive and supportive interventions (Hakanen et al., 2006). These interventions encompass strategies aimed at reducing stressors, improving teacher well-being, and enhancing job satisfaction. Understanding contributing factors, including individual characteristics like proactive personality, can inform the development of tailored interventions that target specific risk factors and enhance teacher resilience (Kong et al., 2021; Pressley, 2021).

Continued research efforts aimed at understanding the antecedents and consequences of teacher burnout are essential (Hultell et al., 2013; Li, 2023). Valid assessment tools like the Maslach Burnout Inventory for Educators (MBI-Ed) have facilitated consistent measurement, enabling researchers to delve into various contributing factors, both individual and contextual, in the progression of burnout (Hakanen and Schaufeli, 2012; Skaalvik and Skaalvik, 2010).

In summary, teacher burnout significantly impacts educators, students, and the educational system, emphasizing the importance of its understanding and assessment. Its conceptualization has laid the groundwork for research and practical interventions aimed at preserving teacher well-being, improving education quality, and addressing challenges within the teaching profession. Understanding the causes and consequences of teacher burnout remains important in promoting educator health, effectiveness, and the sustainability of the education system.

Proactive personality

Proactive personality, a construct encapsulating an individual's propensity for proactive behaviors across various life domains, especially in the workplace, has garnered substantial attention in research (Alikaj et al., 2021; Crant, 2000; Spitzmuller et al., 2015). This disposition characterizes individuals as proactive and self-starting, inclined to take initiative in problem-solving and identifying opportunities (Din et al., 2023; Fuller and Marler, 2009; Grant and Ashford, 2008). Rooted in trait theory within personality psychology, proactive personality reflects an enduring inclination to actively influence one's environment rather than passively reacting to external circumstances (Bateman and Crant, 1993; Costa and McCrae, 1992).

Significantly, proactive personality extends its influence to individual and organizational outcomes, especially within the workplace (Mubarak et al., 2021). Firstly, it aligns with higher job performance by fostering increased productivity and efficiency (Bateman and Crant, 1993; Crant, 2000). Individuals exhibiting proactive behaviors contribute to achieving work-related goals through their willingness to take on additional responsibilities and suggest improvements (Doğanülkü and Korkmaz, 2023). Moreover, proactive personality is intricately linked to fostering innovation and creativity within organizational settings (Frese and Fay, 2001). Proactive individuals are more likely to generate novel ideas and solutions, thereby aiding problem-solving and organizational development efforts (Köksal et al., 2023).

Career success also aligns with proactive personality, as individuals inclined toward proactivity tend to identify opportunities and actively pursue them, resulting in career advancement and the realization of long-term career goals (Seibert et al., 1999). Work engagement, another facet influenced by proactive personality, is positively associated with the trait. Engaged employees exhibit enthusiasm, energy, and dedication in their tasks, attributes that proactive individuals often possess (Bakker and Leiter, 2017; Xanthopoulou et al., 2009). Proactive individuals actively seek ways to enhance their job roles and responsibilities, aligning them more closely with their work. Additionally, proactive personality contributes to adaptability and resilience in the face of change and uncertainty (Bindl et al., 2012; Fuller and Marler, 2009). Proactive individuals are more likely to perceive change as an opportunity for growth, enabling them to navigate organizational transitions more effectively.

Furthermore, the traits associated with proactive personality often overlap with leadership competencies, thereby positively correlating proactive personality with leadership effectiveness (Harding and Rouse, 2007; Pan et al., 2018). While proactive personality offers numerous advantages, its impact can be contingent on contextual factors such as organizational culture and leadership styles (Parker et al., 2019). Excessive proactivity, if not well-directed, may lead to stress and negative outcomes (Crant, 2000; Crant et al., 2016).

Individuals who are proactive possess a repertoire of personal assets that contribute to their well-being and potentially mitigate burnout. These assets extend beyond resilience, self-confidence, and flexible coping mechanisms to encompass characteristics like perfectionistic strivings (e.g., striving for flawlessness) and specific Big Five personality traits (e.g., conscientiousness, agreeableness) (Samfira and Paloş, 2021). By actively leveraging these personal resources, proactive individuals can work to prevent resource depletion, including emotional exhaustion, depersonalization, and diminished personal achievement, which are hallmarks of burnout (Zhang et al., 2022). A growing body of research delves into the intricate relationship between proactive personality and burnout, revealing its potential impact on educators' well-being. Proactive personality, as characterized by initiative, self-directed action, and a relentless focus on improvement (Pan et al., 2021; Dai and Wang, 2023), translates into the classroom setting for Chinese English teachers. These individuals actively seek solutions to challenges, readily take the initiative to implement new teaching methods, and demonstrate a strong desire for continuous improvement. These proactive tendencies are hypothesized to influence teachers' professional experiences in several ways.

Firstly, research by Zhang et al. (2022) suggests that proactive personality's association with burnout is mediated by job satisfaction. This implies that proactive individuals are better equipped to cultivate job satisfaction, ultimately reducing burnout. Similarly, Kong et al. (2021) found an inverse relationship between proactive personality and academic burnout among nursing students, mediated by professional self-efficacy. This research suggests that proactive behaviors might foster self-efficacy, which in turn acts as a buffer against burnout.

Furthermore, Pietarinen et al. (2021) emphasize the efficacy of proactive measures in mitigating teacher burnout at both individual and school levels. This aligns with the notion that proactive teachers can identify and address challenges before they escalate, potentially reducing burnout for themselves and colleagues. Additionally, Li et al.

(2017) highlight that the link between proactive personality and job satisfaction among educators is mediated by self-efficacy and work engagement. Proactive individuals might leverage their initiative to cultivate self-efficacy and work engagement, leading to greater job satisfaction and potentially buffering against burnout. Finally, Wang et al. (2021) provide further support for the positive association between proactive personality and career adaptability and growth potential, which aligns with the conservation of resources theory. Proactive teachers might be better equipped to identify and acquire resources to manage stress and navigate challenges, aligning with the theory's focus on resource conservation.

However, while proactive personality offers various professional advantages, understanding its limitations within diverse work contexts is essential. Contextual factors may influence how proactive behaviors are received, and excessive proactivity can sometimes lead to increased stress or unintended negative outcomes. Studies indicate that the drive for self-initiated actions can create heightened expectations and added pressure, especially in high-demand or conflicting work environments. Therefore, while proactive traits can support innovation, productivity, and career growth, they must be applied thoughtfully and with attention to context to maximize their benefits and mitigate possible drawbacks.

Teaching enjoyment

Teaching enjoyment, defined as the amalgamation of affirmative emotions, contentment, and fulfillment teachers experience within their profession, encapsulates an intrinsic sense of happiness, purpose, and gratification derived from their instructional endeavors (Derakhshan et al., 2022; Skaalvik and Skaalvik, 2017; Zhang et al., 2023a). Originating from psychology's exploration of emotions and job satisfaction, this construct gained recognition within educational contexts as researchers delved deeper into the emotional landscape of educators (Dewaele and Li, 2021; Fathi et al., 2023a; Frenzel et al., 2016). Early studies focused on the emotional dimensions of teaching, highlighting the association between positive emotions, satisfaction, and the teaching profession's intrinsic worth (Brouwers and Tomic, 2000), progressively acknowledging their substantial impact on teacher motivation, job contentment, and overall well-being (MacIntyre and Mercer, 2014; Skaalvik and Skaalvik, 2007; Zhang et al., 2023b).

Teaching enjoyment is demonstrably linked to a related concept: foreign language enjoyment (FLE) experienced by students (Dewaele et al., 2023; Fathi et al., 2023b). FLE refers to the positive emotions and overall enjoyment students associate with learning a foreign language (Hwang et al., 2024; Liu et al., 2024). Studies reveal that teachers who exude high levels of enjoyment can foster a more positive learning environment, which in turn contributes to students' own sense of FLE (Wu et al., 2023; Xie et al., 2023). This phenomenon, termed "emotional contagion" (Xie et al., 2023), highlights the crucial role teachers play in shaping students' attitudes toward language learning. Furthermore, Liu et al. (2023) propose a model demonstrating the positive influence of teaching enjoyment on aspects like student grit and language achievement, further emphasizing the interconnectedness of these constructs.

Teaching enjoyment assumes profound significance within the educational sphere, exerting an influence across various facets of

educators' professional and personal lives, student outcomes, and the overall educational quality. Firstly, it stands as a cornerstone of teacher well-being, correlating with heightened job satisfaction, positive affect, and psychological well-being among educators (Skaalvik and Skaalvik, 2017; Wei et al., 2023). This sense of gratification in teaching contributes significantly to one's professional fulfillment and sense of accomplishment within the educational sphere (Skaalvik and Skaalvik, 2010). Moreover, it aligns closely with job satisfaction, fostering increased motivation and commitment among teachers (Klassen and Chiu, 2010), thereby potentially curbing attrition rates within the profession (Ingersoll and May, 2012).

Beyond personal satisfaction, teaching enjoyment plays a key role in influencing student engagement and learning outcomes. When educators find delight in their work, their enthusiasm and motivation in the classroom become palpable, influencing and enhancing the motivation and engagement levels of students (Ruzek et al., 2016; Frenzel et al., 2009). Additionally, it fosters more effective teaching practices, with educators investing more effort in planning and implementing innovative teaching methods that invariably enhance student learning (Keller et al., 2014; Kunter et al., 2008).

Moreover, teaching enjoyment operates as a shield against teacher burnout, serving as a protective factor against emotional exhaustion and depersonalization—the core dimensions of burnout (Bakker et al., 2006; Kunter et al., 2011). The emotional resources derived from teaching enjoyment equip educators with the tools to navigate the demands and stressors inherent in teaching (Xanthopoulou et al., 2007). Organizational benefits abound as well, with educational institutions fostering a more positive school climate, enhanced teacher collaboration, and elevated staff morale in environments where teaching enjoyment is prevalent (Day et al., 2006). This uplifting environment, in turn, correlates with heightened student achievement and improved school performance. Understanding teaching enjoyment is essential in educational research and practice, as it provides key insights into improving teacher well-being, job satisfaction, and instructional quality. Contributing factors include instructional autonomy, institutional support, and individual traits such as proactive personality (Dewaele et al., 2019; Kunter et al., 2008; Xiao et al., 2022). Efforts to foster teaching enjoyment often focus on reducing job-related stress, enhancing motivation, and creating supportive environments. Recognizing the importance of teaching enjoyment has led to programs and interventions aimed at enriching educators' positive emotional experiences, benefiting teachers, students, and the educational system as a whole.

Research has extensively examined the link between teaching enjoyment and burnout. For instance, Xiao et al. (2022) modeled the relationships between teaching enjoyment, teacher self-efficacy, and work engagement, showing their central roles in teacher well-being and satisfaction. Atmaca et al. (2020) highlighted the emotional facets of teaching and their impact on burnout and job satisfaction, while Taxer et al. (2019) identified how strong teacher-student relationships can mitigate emotional exhaustion and reduce burnout. Khajavy et al. (2017) validated a burnout model among EFL teachers, focusing on how affective and motivational factors shape burnout in this field. Together, these studies underscore the importance of teaching enjoyment as a potential factor in preventing burnout, emphasizing the need to address the emotional, motivational, and relational aspects of teaching to support educators' job satisfaction and resilience.

The hypothesized model

The theoretical underpinnings of this study are rooted in established literature exploring the intricate dynamics between proactive personality traits, teaching enjoyment, and teacher burnout. Building upon prior research, this study formulates and investigates three hypotheses:

H1: Proactive Personality and Teacher Burnout.

The first hypothesis (H1) posits a direct and negative relationship between proactive personality and teacher burnout. This hypothesis is grounded in a wealth of empirical evidence highlighting the significance of proactive traits in shaping individuals' adaptive behaviors and responses within professional settings (Crant, 2000; Fuller and Marler, 2009). Proactive personality is characterized by an individual's proactive and self-initiated approach to tasks, coupled with a strong inclination toward problem-solving and proactive behavior (Seibert et al., 1999). Extensive research across diverse occupational domains has consistently linked proactive personality with favorable outcomes, including heightened resilience, adaptability, and effective stress management (Pietarinen et al., 2021; Xanthopoulou et al., 2009).

The Conservation of Resources (COR) theory (Hobfoll, 1989) provides a theoretical framework to understand this relationship. According to COR theory, individuals strive to acquire and conserve resources to prevent resource depletion. Proactive individuals, equipped with personal resources such as resilience and self-efficacy, actively employ proactive strategies to prevent resource loss, including emotional exhaustion, depersonalization, and reduced personal accomplishment—the core dimensions of burnout (Hakanen and Schaufeli, 2012; Kong et al., 2021; Li et al., 2017; Pietarinen et al., 2021; Wang et al., 2021; Xanthopoulou et al., 2009; Zhang et al., 2022). Therefore, it is hypothesized that educators with proactive personality traits are less susceptible to burnout due to their proactive approach in acquiring and managing personal resources, thus demonstrating a negative association between proactive personality and teacher burnout.

H2: Proactive Personality and Teaching Enjoyment.

This hypothesis posits a direct and positive association between proactive personality and teaching enjoyment. Proactive individuals are characterized by self-starting tendencies, initiative, and a focus on improvement (Li et al., 2024). These qualities empower them to create engaging learning experiences (Bakker et al., 2006), actively seek solutions to classroom challenges (Crant, 2000), and ultimately derive greater enjoyment from their teaching practice (Xiao et al., 2022). Proactive teachers might be more likely to implement innovative teaching methods (Li et al., 2017), fostering a sense of accomplishment and satisfaction that contributes to their teaching enjoyment (Skaalvik and Skaalvik, 2017).

H3: Teaching Enjoyment as a Mediator.

The third hypothesis (H3) proposes that teaching enjoyment mediates the relationship between proactive personality and teacher burnout, establishing a sequential relationship of proactive personality → teaching enjoyment → teacher burnout. The conceptualization of

teaching enjoyment stems from literature highlighting its pivotal role in mitigating burnout among educators (Keller et al., 2014; Skaalvik and Skaalvik, 2017). Teaching enjoyment reflects positive emotions, job satisfaction, and fulfillment experienced in the teaching profession, contributing significantly to reducing the risk of burnout (Atmaca et al., 2020; Bakker et al., 2006; Khajavy et al., 2017; Kunter et al., 2011; Taxer et al., 2019; Xiao et al., 2022).

The proposed mediation aligns with the Job Demands-Resources (JD-R) model (Demerouti et al., 2001). This model suggests that personal resources, such as proactive personality, act as buffers against job demands that could lead to burnout. Proactive individuals are more inclined to seek opportunities that resonate with their proactive nature, engage more deeply in their teaching, adapt their pedagogical methods to enhance student engagement, and foster a supportive classroom atmosphere (Verešová and Malá, 2012). These proactive behaviors, stemming from proactive personality traits, are expected to enhance teaching enjoyment, leading to reduced levels of burnout. Therefore, it is hypothesized that teaching enjoyment mediates the relationship between proactive personality and teacher burnout, indicating that proactive individuals experience greater teaching enjoyment, which, in turn, acts as a protective factor against burnout.

Materials and methods

Participants and procedures

A sample of 420 Chinese educators (236 females, 56.2%; 184 males, 43.8%) was recruited to participate in this study. These educators hail from primary and middle schools across various provinces in China, including Guangdong, Jiangsu, Zhejiang, Sichuan, and Shandong. The participants' ages ranged from 26 to 50 years ($M = 34.75$, $SD = 5.90$). Teaching experience varied within the sample, with 198 educators (47.1%) possessing over 10 years of experience, and 222 (52.9%) having less than 10 years. Marital status distribution reflected further diversity, with 320 participants (76.2%) married or in long-term partnerships, and 100 (23.8%) single. Finally, classroom sizes averaged 35 students, encompassing a range of settings from bustling urban to serene suburban regions.

Data collection procedures involved established online survey administration platforms. Following ethical approval procedures from the Institutional Review Board (IRB) of Chongqing Preschool Education College, data collection involved established online survey administration platforms. With informed consent obtained, teachers were invited to participate through a link to the questionnaire distributed via school administration or relevant educational networks within each participating province. This online approach ensured efficient data collection from geographically dispersed participants. To ensure confidentiality and anonymity, participants completed the questionnaires independently within a designated time frame. The survey instruments, designed to take approximately 20–25 min, assessed proactive personality, teaching enjoyment, and burnout.

Measures

To assess the key variables in this study, we utilized a set of validated self-report measures. Proactive personality traits were

evaluated using the abbreviated version of the Proactive Personality Scale (S-PPS) developed by Seibert et al. (1999). This 10-item instrument asks participants to rate their agreement with statements on a 6-point Likert scale ranging from 1 (strongly disagree) to 6 (strongly agree). For example, one statement might be “I am constantly on the lookout for new ways to improve my life.” Notably, the Chinese adaptation of the S-PPS employed in this study was translated by Shang and Gan (2009). This adaptation demonstrated strong internal consistency within our sample, with a Cronbach’s alpha of 0.88, indicating reliable measurement of proactive personality.

Teaching enjoyment within the classroom environment was assessed through the Foreign Language Teaching Enjoyment Scale (FLTES)—a self-report questionnaire developed by Ergün and Dewaele (2021). Adapted from the original scale by Botes et al. (2021), the FLTES comprises nine items that categorize teaching enjoyment into three distinct dimensions: Personal Enjoyment (PE), Student Appreciation (SA), and Social Enjoyment (SE). Participants indicated their level of agreement with statements using a 5-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree). An example item is “The students are friendly.” While Ergün and Dewaele (2021) reported robust reliability for this instrument, its internal consistency in our study was even higher, with a Cronbach’s alpha of 0.91, signifying excellent internal consistency.

Finally, the teacher-adapted version of the Maslach Burnout Inventory (MBI-ES), validated and piloted by Maslach et al. (1997), was employed to gauge burnout among participating educators. This 22-item self-report measure assesses three key dimensions of burnout: reduced personal accomplishment, depersonalization, and emotional exhaustion. Respondents rated each item on a seven-point Likert scale ranging from 0 (never) to 6 (every day). It’s important to note that within this inventory, burnout manifests as decreased scores in personal accomplishment alongside increased scores in depersonalization and emotional exhaustion. For example, a sample item from the MBI-ES is: “I feel tired at the end of the working day.” The MBI-ES also demonstrated good internal consistency in our study, with a Cronbach’s alpha of 0.81, indicating a reliable measure of burnout.

Data analysis

Data analysis was conducted using SPSS (Version 26) and Amos (Version 26) with Maximum Likelihood Estimation (MLE). A rigorous protocol was followed to address data quality, including screening for outliers, handling missing values, and verifying multivariate normality. Missing data, which ranged between 0.71 and 1.32%, was minimal and found to meet the criteria for Missing Completely at Random (MCAR), as validated by Little’s MCAR test ($\chi^2 = 1139.13$, $p = 0.541$). To address these missing values, Expectation Maximization (EM), a robust imputation technique

for Structural Equation Modeling (SEM), was applied (Kline, 2023).

Univariate outliers were identified using scatter plots and standardized Z-values, leading to the exclusion of eight cases. Skewness and kurtosis analyses confirmed that data normality fell within acceptable bounds (−1 to +1), following guidelines by Hoyle (1995) (see Table 1). Additionally, multivariate outliers were assessed using Mahalanobis distance, with one extreme case removed based on the critical chi-square cutoff at the 0.001 level, following Meyers et al. (2016). This process left a final sample of 413 participants.

Confirmatory Factor Analysis (CFA) was used to test the validity of measurement scales, resulting in strong model fit (refer to Table 1). Subsequently, Structural Equation Modeling (SEM) was implemented to examine whether teaching enjoyment mediated the relationship between proactive personality and burnout.

To evaluate model adequacy, we adhered to the established fit indices. These metrics included the χ^2/df ratio, Goodness of Fit Index (GFI), Comparative Fit Index (CFI), Root-Mean-Square Error of Approximation (RMSEA), and Standardized Root-Mean-Square Residual (SRMR). An acceptable model fit was indicated by a χ^2/df ratio below 3 and a non-significant p -value ($p > 0.05$). Additionally, GFI and CFI values exceeding 0.90, along with RMSEA and SRMR values under 0.08 and 0.10, respectively, were deemed to reflect good model fit (Hu and Bentler, 1999).

Results

This research aimed to analyze three primary variables—burnout, proactive personality, and teaching enjoyment—comparing these dimensions across male and female educators. Male educators reported an average burnout score of 4.23 (SD = 0.75), whereas females had a slightly lower mean score of 4.05 (SD = 0.68). In terms of proactive personality, males averaged 3.51 (SD = 0.80), with females scoring higher at 3.70 (SD = 0.85). For teaching enjoyment, male participants scored 4.64 on average (SD = 0.92), while females averaged 4.35 (SD = 0.78).

Before performing statistical tests for group differences, we applied the Shapiro–Wilk test to confirm that each variable met the normality assumption. Results supported normal distribution for burnout ($p = 0.203$), proactive personality ($p = 0.311$), and teaching enjoyment ($p = 0.176$). Independent samples t -tests were then conducted to assess whether significant differences existed between male and female educators on these variables. Findings indicated no statistically significant differences between genders in burnout ($t = -1.125$, $p = 0.282$, Cohen’s $d = 0.13$), proactive personality ($t = 0.734$, $p = 0.457$, Cohen’s $d = 0.09$), or teaching enjoyment ($t = -0.891$, $p = 0.376$, Cohen’s $d = 0.11$). Table 2 provides a detailed breakdown of these test results, outlining gender comparisons for each variable measured.

TABLE 1 CFA results.

	χ^2	df	χ^2/df	p	CFI	RMSEA	SRMR	α
Burnout	210.567	110	1.914	<0.001	0.965	0.056	0.046	0.81
Proactive personality	115.783	60	1.930	<0.001	0.977	0.049	0.034	0.88
Teaching enjoyment	160.249	85	1.884	<0.001	0.981	0.043	0.030	0.91

TABLE 2 The results of the independent samples *t*-tests.

Variable	Male	Female	<i>t</i> -value	<i>p</i> -value	Cohen's <i>d</i>
	<i>M</i> (SD)	<i>M</i> (SD)			
Burnout	4.23 (0.75)	4.05 (0.68)	−1.125	0.282	0.13
Proactive personality	3.51 (0.80)	3.70 (0.85)	0.734	0.457	0.09
Teaching enjoyment	4.64 (0.92)	4.35 (0.78)	−0.891	0.376	0.11

Validity and reliability analysis

Table 1 presents the results of first-order confirmatory factor analyses (CFAs) and the reliability indices of the three measurement scales. The table showcases the outcomes of the first-order confirmatory factor analyses (CFAs) for burnout, proactive personality, and teaching enjoyment. Additionally, reliability indices (Cronbach's alpha, α) for each construct are provided. The analyses demonstrated strong support for the reliability and validity of the measurement scales used in this study, as indicated by the confirmatory factor analysis results and the high reliability coefficients (α) for each construct.

Descriptive statistics and Pearson's correlations among the studied constructs are presented in Table 3. The results indicate that proactive personality was positively correlated with teaching enjoyment ($r = 0.63, p < 0.01$) and negatively correlated with burnout ($r = -0.49, p < 0.01$). Teaching enjoyment exhibited a significant negative correlation with burnout ($r = -0.49, p < 0.01$).

Descriptive statistics revealed the following: The mean score for proactive personality was 3.61 (SD = 0.83), for teaching enjoyment was 4.49 (SD = 0.84), and for burnout was 4.14 (SD = 0.72). Skewness values were found to be −0.16, −0.18, and 0.11 for proactive personality, teaching enjoyment, and burnout, respectively. Kurtosis values were −0.09, −0.08, and −0.24 for proactive personality, teaching enjoyment, and burnout, respectively. These findings provide initial insights into the relationships between proactive personality, teaching enjoyment, and burnout among EFL teachers.

SEM analysis

Utilizing SEM, the study examined how teaching enjoyment mediates the relationship between proactive personality and teacher burnout. The structural model's fit was evaluated through various indices for two separate groups—male and female teachers. The findings revealed a strong alignment of the proposed model with the data for male teachers ($\chi^2/\text{df} = 1.620$, CFI = 0.936, TLI = 0.929, IFI = 0.936, RMSEA = 0.039, and SRMR = 0.051) and female teachers ($\chi^2/\text{df} = 1.543$, CFI = 0.942, TLI = 0.937, IFI = 0.941, RMSEA = 0.041, and SRMR = 0.055). Figure 1 provides a visual representation of the standardized parameter estimates for this model.

To further investigate whether model coefficients differed by gender, a multi-group invariance analysis was performed. Results from the χ^2 difference test comparing constrained and unconstrained models ($\Delta\chi^2 = 6.283$, $\Delta\text{df} = 5$, $p = 0.289$) revealed that the mediation model's coefficients were consistent across both male and female groups. Thus, no significant differences were identified between genders for either the direct or indirect effects of the predictor variable on the outcome variable. Additionally, to evaluate the stability of

TABLE 3 Descriptive statistics.

Constructs	Proactive personality	Teaching enjoyment	Burnout
1. Proactive personality	1		
2. Teaching enjoyment	0.63**	1	
3. Burnout	−0.49**	−0.49**	1
4. Mean	3.61	4.49	4.14
5. SD	0.83	0.84	0.72
6. Skewedness	−0.16	−0.18	0.11
7. Kurtosis	−0.09	−0.08	−0.24

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

indirect effects across genders, we conducted a bootstrap resampling procedure with 500 iterations, providing further support for the robustness of the findings in both groups.

Table 4 presents the comprehensive overview of the direct and indirect effects elucidated within the structural model, uncovering the intricate interrelations among the key constructs under scrutiny. Delving into the direct effects analysis, several pivotal relationships were identified, shedding light on the associations observed within the model.

Firstly, the path analysis revealed a significant and substantial negative relationship between proactive personality and burnout ($\beta = -0.366$, $\text{SE} = 0.159$, $p < 0.001$, 95% CI [−0.471, −0.261]). This finding underscores that higher levels of proactive personality were markedly linked to lower levels of burnout among educators, affirming the influential role of proactive tendencies in mitigating the manifestations of burnout within the teaching profession.

Moreover, a noteworthy positive relationship emerged between proactive personality and teaching enjoyment ($\beta = 0.487$, $\text{SE} = 0.176$, $p < 0.001$, 95% CI [0.142, 0.832]). This substantial positive association indicates that higher levels of proactive personality are associated with increased levels of teaching enjoyment, aligning with the notion that proactive traits may contribute to fostering a positive teaching experience. Furthermore, the analysis revealed a compelling negative relationship between teaching enjoyment and burnout ($\beta = -0.512$, $\text{SE} = 0.167$, $p < 0.001$, 95% CI [−0.645, −0.379]). This negative association suggests that higher levels of teaching enjoyment are correlated with lower levels of burnout among educators, supporting the idea that positive emotional experiences might play a protective role in mitigating burnout symptoms.

Moving to the realm of indirect effects, the investigation uncovered a significant negative indirect relationship between proactive personality and burnout, mediated by teaching enjoyment ($\beta = -0.249$, $\text{SE} = 0.102$, $p < 0.001$, 95% CI [−0.324, −0.073]). This finding suggests that proactive personality may be indirectly

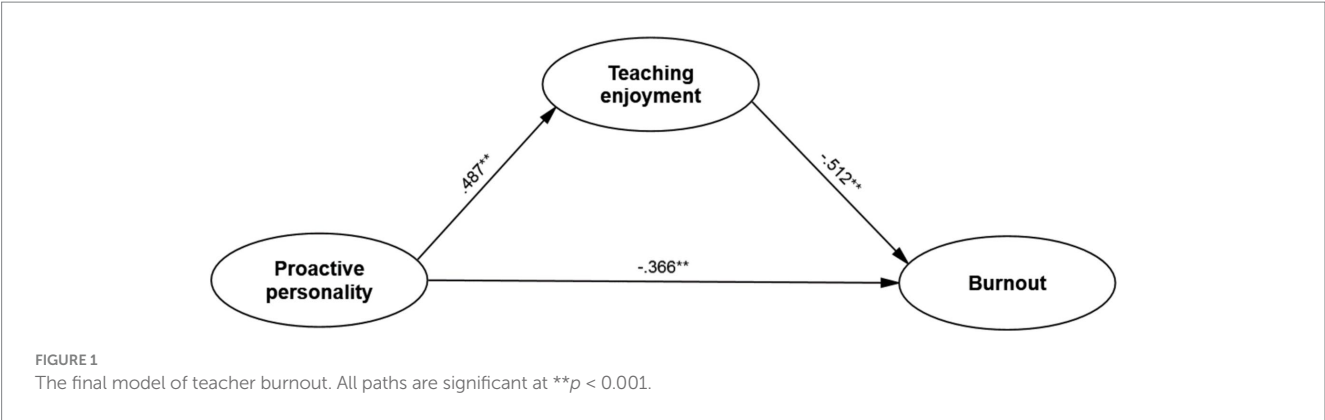


TABLE 4 SEM results of the model.

				95% CI	
Model pathways	SE	β	p	Lower bound	Upper bound
Direct effects					
Proactive personality → burnout	0.159	−0.366	<0.001	−0.471	−0.261
Proactive personality → Enjoyment	0.176	0.487	<0.001	0.142	0.832
Enjoyment → burnout	0.167	−0.512	<0.001	−0.645	−0.379
Indirect effect					
Proactive personality → enjoyment → burnout	0.102	−0.249	<0.001	−0.324	−0.073

associated with lower levels of burnout through its positive relationship with teaching enjoyment.

Measurement invariance analysis

To examine whether the mediation model operated equivalently across genders, we conducted a measurement invariance analysis focusing on potential differences in path coefficients between male and female teachers. The results indicated that the proposed model provided a good fit for both groups. Specifically, the multi-group invariance analysis showed acceptable fit indices for both the constrained model ($\chi^2/df = 1.618$, CFI = 0.932, TLI = 0.927, RMSEA = 0.038, SRMR = 0.067) and the unconstrained model ($\chi^2/df = 1.617$, CFI = 0.931, TLI = 0.926, RMSEA = 0.039, SRMR = 0.068).

Additionally, the chi-square difference test ($\Delta\chi^2 = 2.715$, $\Delta df = 3$, $p = 0.467$) revealed no significant differences in the model coefficients between male and female teachers within the mediation model. This suggests that the relationships among the variables are consistent across genders. Further, we performed separate Structural Equation Modeling (SEM) analyses for male and female teachers to validate these findings. Both groups demonstrated acceptable model fits: for male teachers, the fit indices were $\chi^2/df = 1.391$, $p < 0.001$, CFI = 0.935, RMSEA = 0.049, SRMR = 0.068; for female teachers, the indices were $\chi^2/df = 1.499$, $p < 0.001$, CFI = 0.927, RMSEA = 0.052, SRMR = 0.065.

In summary, these analyses indicate that there are no significant differences between male and female teachers regarding the direct and indirect effects of proactive personality on burnout through teaching

enjoyment. The mediating effect of teaching enjoyment remained stable and consistent across both genders, reinforcing the robustness of the proposed model in explaining the relationships among these variables for all participants.

Discussion

The objective of this study was to investigate the relationship between proactive personality, teaching enjoyment, and teacher burnout within the context of educational settings. Specifically, we sought to explore how proactive personality traits among educators are related with their experiences of burnout and whether teaching enjoyment acts as a mediator in this relationship. Understanding these dynamics is pivotal in unraveling the intricate interplay between individual dispositions, emotional experiences, and occupational well-being in the realm of teaching. By examining these associations, this study aimed to contribute to the existing body of knowledge on teacher well-being and provide insights into potential mechanisms that may relate to burnout prevention, which could inform interventions designed to support educators' professional experiences and overall job satisfaction.

First, it was found that there was a negative direct relationship observed between proactive personality and teacher burnout in our study. This aligns with and contributes to the existing literature on personality factors influencing teacher well-being and burnout (e.g., Kong et al., 2021; Li et al., 2017; Pietarinen et al., 2021; Samfira et al., 2023; Zhang et al., 2022; Wang et al., 2021). Proactive personality is associated with positive outcomes in occupational settings.

Individuals with proactive personalities tend to engage in problem-solving, take initiative, and actively shape their work environments (Crant, 2000; Fuller and Marler, 2009). This disposition is linked to increased resilience, adaptability, and effective management of work-related stressors, which contrasts with the symptoms of burnout (Pietarinen et al., 2021; Seibert et al., 1999). The negative correlation between proactive personality and teacher burnout is consistent with the conservation of resources theory (Hobfoll, 1989). According to this theory, individuals strive to acquire and maintain resources to prevent their loss. Proactive individuals often possess personal resources such as resilience, self-efficacy, and adaptive coping strategies, which they use to prevent resource depletion leading to emotional exhaustion, depersonalization, and reduced personal accomplishment—the key dimensions of burnout (Hakanen and Schaufeli, 2012; Pietarinen et al., 2021; Xanthopoulou et al., 2009; Wang et al., 2021).

Moreover, the negative relationship between proactive personality and teacher burnout aligns with the broader literature on job-related stress and burnout across various professions. Studies across different occupational settings have consistently shown that proactive individuals are better equipped to manage stress and prevent burnout due to their proactive strategies for resource acquisition, utilization, and conservation (Crant, 2000; Parker et al., 2019). This resource accumulation and management may include the development of self-efficacy, a sense of control, and the ability to effectively cope with job demands (Li et al., 2017). As proactive individuals invest in these resources, they are better equipped to manage the emotional and physical demands of teaching (Van der Heijden et al., 2015), reducing their susceptibility to burnout.

This finding is also in line with the Job Demands-Resources (JD-R) model (Demerouti et al., 2001), which posits that personal resources, such as proactive personality, serve as buffers against job demands that can lead to burnout. The negative relationship between proactive personality and burnout suggests that proactive individuals may actively seek resources to manage the challenges inherent in the teaching profession. This may involve engaging in problem-focused coping strategies, seeking professional development, and adopting adaptive teaching practices that reduce the risk of burnout (Wen et al., 2022).

Furthermore, the relationship between proactive personality and teacher burnout highlights the importance of individual-level variables and support systems in educational settings (Salmela-Aro et al., 2008). Teachers with proactive personalities may benefit from programs that encourage and harness their proactive qualities, such as innovative teaching approaches, mentorship, and opportunities for professional growth (Erdogan and Bauer, 2005). These interventions can help sustain their proactive outlook and protect them from burnout. Additionally, these findings underscore the relevance of selecting and retaining educators with proactive personality traits, as they may exhibit greater resilience in the face of the inherent challenges of the teaching profession (Zhang et al., 2022).

In addition, it was found that teaching enjoyment served as a mediator in the relationship between proactive personality and teacher burnout. Again, in light of JD-R model, proactive personality can be considered a personal resource that enables individuals to effectively manage job demands. Individuals who take initiative tend to actively pursue opportunities that correspond with their personal interests, strengths, and values (Grant and Ashford, 2008; Parker et al.,

2019). As a result, they may be more engaged in their teaching, adapt their pedagogical approaches to enhance student engagement, and create a positive and supportive classroom atmosphere (Verešová and Malá, 2012). These proactive behaviors appear to be linked to higher levels of teaching enjoyment, as individuals may experience greater satisfaction in their work when it is perceived as meaningful and aligns with their proactive approach (Pyhältö et al., 2021). Teaching enjoyment, in turn, acts as a protective factor against teacher burnout. Previous research has shown that higher levels of job satisfaction and positive affect are associated with lower levels of burnout (Atmaca et al., 2020; Khajavy et al., 2017; Schaufeli and Bakker, 2004; Taxer et al., 2019; Xiao et al., 2022). When teachers experience enjoyment in their work, they tend to report higher levels of satisfaction, motivation, and emotional connection to their role, which is associated with a lower likelihood of emotional exhaustion, one of the core dimensions of burnout (Maslach and Leiter, 2008).

Additionally, individuals with proactive personalities tend to actively engage in problem-solving, take initiative, and exhibit a proactive stance toward their work environment (Crant, 2000; Fuller and Marler, 2009). This proactive disposition aligns with increased resilience, adaptability, and the ability to effectively manage work-related stressors, which are antithetical to the manifestations of burnout (Pietarinen et al., 2021; Seibert et al., 1999). Also, teaching enjoyment, characterized by positive emotions, satisfaction, and fulfillment in the teaching profession, is known to play a crucial role in mitigating teacher burnout (Keller et al., 2014; Skaalvik and Skaalvik, 2017). Educators who experience high levels of teaching enjoyment are less likely to suffer from emotional exhaustion and depersonalization, the core dimensions of burnout (Bakker et al., 2006; Kunter et al., 2011). Recognizing teaching enjoyment as a mediator highlights its potential role in lessening the negative impact of occupational stressors, which may be associated with proactive personality traits and, in turn, relate to lower levels of teacher burnout. This finding resonates with previous research highlighting the protective role of positive emotions and satisfaction in reducing the risk of burnout among educators (Frondozo et al., 2020; Schaufeli et al., 2006).

Furthermore, this mediation finding is consistent with COR theory (Hobfoll, 1989), which posits that individuals strive to acquire and preserve resources to avoid depletion. Proactive individuals may possess personal resources, such as resilience, self-efficacy, and adaptive coping skills, which support their capacity to experience teaching enjoyment. In turn, teaching enjoyment functions as an emotional resource, enabling educators to manage teaching-related demands and reduce burnout risk (Xanthopoulou et al., 2007). Thus, the mediating role of teaching enjoyment in the link between proactive personality and teacher burnout underscores the significance of individual traits and emotional factors in the teaching profession. By understanding how proactive personality may be associated with teaching enjoyment and how this relationship could potentially reduce teacher burnout, educators and educational institutions can consider targeted steps to support the well-being and job satisfaction of teachers.

Conclusion and implications

Taken together, this study explores the relationships between proactive personality, teaching enjoyment, and teacher burnout,

highlighting teaching enjoyment as a potential mediator in the association between proactive personality and burnout. Findings suggest that proactive traits may support teaching enjoyment, which could help protect against burnout. These results carry practical implications for educators and educational institutions, highlighting the importance of recognizing and nurturing proactive traits in teachers, as well as fostering positive emotional experiences in the teaching profession. By examining how proactive personality correlates with burnout, educators, administrators, and policymakers can develop strategies aimed at enhancing teachers' well-being and job satisfaction, thereby potentially improving educational outcomes.

For educators, understanding the connection between proactive personality, teaching enjoyment, and burnout provides a basis for self-reflection and professional development. Proactive individuals may benefit from tailored development opportunities that leverage their strengths, which could enrich their teaching experiences and mitigate burnout risk. For example, professional development programs focused on goal-setting, problem-solving, and innovative teaching practices may be particularly valuable for proactive teachers. Additionally, educators can cultivate proactive behaviors by taking on leadership roles within their schools or participating in curriculum development initiatives.

Educational institutions can apply these findings by creating policies that support teacher well-being. Building a collaborative work environment, providing professional development opportunities, and recognizing proactive teachers' contributions can enhance job satisfaction and engagement. Additionally, including proactive personality assessments in recruitment and development processes could help identify candidates who are likely to thrive in teaching roles. Schools may also consider evidence-based interventions designed to increase teaching enjoyment and reduce burnout. For example, autonomy-supportive training for teachers, as suggested by [Tilga et al. \(2021\)](#), has been shown to improve teachers' psychological well-being and teaching efficacy. Empowering students to take responsibility for their learning and promoting self-determination can foster a more positive classroom environment.

From a policy perspective, this study highlights the need for strategies focused on teacher well-being and job satisfaction. Investments in training, support systems, and professional development that align with proactive traits can help build a resilient teaching workforce. Recognizing teaching enjoyment as a buffer against burnout may further inform policies aimed at improving educational outcomes.

Despite these contributions, several limitations must be acknowledged. First, the sample size and demographic scope may restrict the generalizability of the findings, and future research using larger and more diverse samples could enhance external validity. Second, the cross-sectional design captures associations between variables at a single time point, which restricts our ability to draw causal conclusions. Longitudinal studies following participants over extended periods or experimental studies that manipulate variables could provide more robust insights into potential causal pathways. Additionally, the study relies on self-report measures, which can introduce response biases. Incorporating multiple data sources, such as peer or supervisor evaluations and administrative data, would add depth and strengthen the validity of the findings. Lastly, this study did

not specifically examine contextual factors such as school culture, administrative support, or job demands, which may significantly impact teacher well-being. Future research should investigate these contextual influences to provide a more comprehensive understanding of factors affecting teacher burnout and job satisfaction.

Data availability statement

The data analyzed in this study is subject to the following licenses/restrictions: The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation. Requests to access these datasets should be directed to Hu Chunyan, Email: Cindy_Hu202308@126.com.

Ethics statement

The studies involving humans were approved by Chongqing Preschool Education College, Chongqing, 404000. 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

HC: Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Project administration, Resources, Software, Supervision, Validation, Visualization, Writing – original draft, Writing – review & editing. LY: Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Project administration, Software, Supervision, Visualization, 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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References

- Alikaj, A., Ning, W., and Wu, B. (2021). Proactive personality and creative behavior: examining the role of thriving at work and high-involvement HR practices. *J. Bus. Psychol.* 36, 857–869. doi: 10.1007/s10869-020-09704-5
- Atmaca, Ç., Rızaoglu, F., Türkdoğan, T., and Yaylı, D. (2020). An emotion focused approach in predicting teacher burnout and job satisfaction. *Teach. Teach. Educ.* 90:103025. doi: 10.1016/j.tate.2020.103025
- Bakker, A. B., and Leiter, M. (2017). Strategic and proactive approaches to work engagement. *Organ. Dyn.* 46, 67–75. doi: 10.1016/j.orgdyn.2017.04.002
- Bakker, A. B., Emmerik, H. V. and Euwema, M. C. (2006). Crossover of burnout and engagement in work teams. *Work and Occupations* 33, 464–489. doi: 10.1177/0730888406291310
- Bakker, A. B., Van Der Zee, K. I., Lewig, K. A., and Dollard, M. F. (2006). The relationship between the big five personality factors and burnout: a study among volunteer counselors. *J. Soc. Psychol.* 146, 31–50. doi: 10.3200/SOCP.146.1.31-50
- Bateman, T. S., and Crant, J. M. (1993). The proactive component of organizational behavior: a measure and correlates. *J. Organ. Behav.* 14, 103–118. doi: 10.1002/job.4030140202
- Bindl, U. K., Parker, S. K., Totterdell, P., and Hagger-Johnson, G. (2012). Fuel of the self-starter: how mood relates to proactive goal regulation. *J. Appl. Psychol.* 97, 134–150. doi: 10.1037/a0024368
- Botes, E., Dewaele, J. M., and Greiff, S. (2021). The development of a short-form foreign language enjoyment scale. *Mod. Lang. J.* 105, 858–876. doi: 10.1111/modl.12741
- Brady, L. L., McDaniel, S. C., and Choi, Y. J. (2023). Teacher stress and burnout: the role of psychological work resources and implications for practitioners. *Psychol. Sch.* 60, 1706–1726. doi: 10.1002/pits.22805
- Brouwers, A., and Tomic, W. (2000). A longitudinal study of teacher burnout and perceived self-efficacy in classroom management. *Teach. Teach. Educ.* 16, 239–253. doi: 10.1016/S0742-051X(99)00057-8
- Cano-García, F. J., Padilla-Muñoz, E. M., and Carrasco-Ortiz, M. Á. (2005). Personality and contextual variables in teacher burnout. *Personal. Individ. Differ.* 38, 929–940. doi: 10.1016/j.paid.2004.06.018
- Chang, M. L. (2009). An appraisal perspective of teacher burnout: examining the emotional work of teachers. *Educ. Psychol. Rev.* 21, 193–218. doi: 10.1007/s10648-009-9106-y
- Chen, S. (2023). Modeling the effect of loving pedagogy dispositions and teacher self-efficacy on teacher burnout. *Front. Psychol.* 14:1157324. doi: 10.3389/fpsyg.2023.1157324
- Chen, S., Ntim, S. Y., Zhao, Y., and Qin, J. (2023). Characteristics and influencing factors of early childhood teachers' work stress and burnout: a comparative study between China, Ghana, and Pakistan. *Front. Psychol.* 14:1115866. doi: 10.3389/fpsyg.2023.1115866
- Cheng, H., Fan, Y., and Lau, H. (2023). An integrative review on job burnout among teachers in China: implications for human resource management. *Int. J. Hum. Resour. Manag.* 34, 529–561. doi: 10.1080/09585192.2022.2078991
- Costa, P. T., and McCrae, R. R. (1992). Normal personality assessment in clinical practice: the NEO personality inventory. *Psychol. Assess.* 4, 5–13. doi: 10.1037/1040-3590.4.1.5
- Crant, J. M. (2000). Proactive behavior in organizations. *J. Manag.* 26, 435–462. doi: 10.1177/014920630002600304
- Crant, J. M., Hu, J., and Jiang, K. (2016). "Proactive personality: a twenty-year review" in Proactivity at work. eds. S. K. Parker and U. K. Bindl (New York: Routledge), 211–243.
- Dai, K., and Wang, Y. (2023). Investigating the interplay of Chinese EFL teachers' proactive personality, flow, and work engagement. *J. Multiling. Multicult. Dev.* 1–15. doi: 10.1080/01434632.2023.2174128
- Day, C., Kington, A., Stobart, G., and Sammons, P. (2006). The personal and professional selves of teachers: stable and unstable identities. *Br. Educ. Res. J.* 32, 601–616. doi: 10.1080/01411920600775316
- Deci, E. L., and Ryan, R. M. (2000). The "what" and "why" of goal pursuits: human needs and the self-determination of behavior. *Psychol. Inq.* 11, 227–268. doi: 10.1207/S15327965PLI1104_01
- Demerouti, E., Bakker, A. B., Nachreiner, F., and Schaufeli, W. B. (2001). The job demands-resources model of burnout. *J. Appl. Psychol.* 86, 499–512. doi: 10.1037/0021-9010.86.3.499
- Derakhshan, A., Dewaele, J. M., and Noughabi, M. A. (2022). Modeling the contribution of resilience, well-being, and L2 grit to foreign language teaching enjoyment among Iranian English language teachers. *System* 109:102890. doi: 10.1016/j.system.2022.102890
- Dewaele, J. M., Botes, E., and Meftah, R. (2023). A three-body problem: the effects of foreign language anxiety, enjoyment, and boredom on academic achievement. *Annu. Rev. Appl. Linguist.* 43, 7–22. doi: 10.1017/S0267190523000016
- Dewaele, J. M., and Li, C. (2021). Teacher enthusiasm and students' social-behavioral learning engagement: the mediating role of student enjoyment and boredom in Chinese EFL classes. *Lang. Teach. Res.* 25, 922–945. doi: 10.1177/13621688211014538
- Dewaele, J. M., Magdalena, A. F., and Saito, K. (2019). The effect of perception of teacher characteristics on Spanish EFL learners' anxiety and enjoyment. *Mod. Lang. J.* 103, 412–427. doi: 10.1111/modl.12555
- Din, S. U., Khan, M. A., Farid, H., and Rodrigo, P. (2023). Proactive personality: a bibliographic review of research trends and publications. *Personal. Individ. Differ.* 205:112066. doi: 10.1016/j.paid.2022.112066
- Doğanülkü, H. A., and Korkmaz, O. (2023). The role of proactive personality and general self-efficacy in proactive career behavior: a mediation model. *Int. J. Educ. Vocat. Guid.* 1–25, 1–25. doi: 10.1007/s10775-023-09597-9
- Erdogan, B., and Bauer, T. N. (2005). Enhancing career benefits of employee proactive personality: the role of fit with jobs and organizations. *Pers. Psychol.* 58, 859–891. doi: 10.1111/j.1744-6570.2005.00772.x
- Ergün, A. L. P., and Dewaele, J. M. (2021). Do well-being and resilience predict the foreign language teaching enjoyment of teachers of Italian? *System* 99:102506. doi: 10.1016/j.system.2021.102506
- Fathi, J., Pawlak, M., Kruk, M., and Naderi, M. (2023a). Modelling boredom in the EFL context: an investigation of the role of coping self-efficacy, mindfulness, and foreign language enjoyment. *Lang. Teach. Res.* 13621688231182176. doi: 10.1177/13621688231182176
- Fathi, J., Zhang, L. J., and Arefian, M. H. (2023b). Testing a model of EFL teachers' work engagement: the roles of teachers' professional identity, L2 grit, and foreign language teaching enjoyment. *Int. Rev. Appl. Linguist. Lang. Teach.* 62, 2087–2119. doi: 10.1515/iral-2023-0024
- Frenzel, A. C., Goetz, T., Lüdtke, O., Pekrun, R., and Sutton, R. E. (2009). Emotional transmission in the classroom: exploring the relationship between teacher and student enjoyment. *J. Educ. Psychol.* 101, 705–716. doi: 10.1037/a0014695
- Frenzel, A. C., Pekrun, R., Goetz, T., Daniels, L. M., Durksen, T. L., Becker-Kurz, B., et al. (2016). Measuring teachers' enjoyment, anger, and anxiety: the teacher emotions scales (TES). *Contemp. Educ. Psychol.* 46, 148–163. doi: 10.1016/j.cedpsych.2016.05.003
- Frese, M., and Fay, D. (2001). Personal initiative: an active performance concept for work in the 21st century. *Res. Organ. Behav.* 23, 133–187. doi: 10.1016/S0191-3085(01)23005-6
- Freudenberger, H. J. (1974). Staff burn-out. *J. Soc. Issues* 30, 159–165. doi: 10.1111/j.1540-4560.1974.tb00706.x
- Fronozo, C. E., King, R. B., Nalipay, M. J. N., and Mordeno, I. G. (2020). Mindsets matter for teachers, too: growth mindset about teaching ability predicts teachers' enjoyment and engagement. *Curr. Psychol.* 41, 5030–5033. doi: 10.1007/s12144-020-01008-4
- Fuller, J. B., and Marler, L. E. (2009). Change-driven by nature: a meta-analytic review of the proactive personality literature. *J. Vocat. Behav.* 75, 329–345. doi: 10.1016/j.jvb.2009.05.008
- Grant, A. M., and Ashford, S. J. (2008). The dynamics of proactivity at work. *Res. Organ. Behav.* 28, 3–34. doi: 10.1016/j.riob.2008.04.002
- Grayson, J. L., and Alvarez, H. K. (2008). School climate factors relating to teacher burnout: a mediator model. *Teach. Teach. Educ.* 24, 1349–1363. doi: 10.1016/j.tate.2007.06.005
- Hakanen, J. J., Bakker, A. B., and Schaufeli, W. B. (2006). Burnout and work engagement among teachers. *J. Sch. Psychol.* 43, 495–513. doi: 10.1016/j.jsp.2005.11.001
- Hakanen, J. J., and Schaufeli, W. B. (2012). Do burnout and work engagement predict depressive symptoms and life satisfaction? A three-wave seven-year prospective study. *J. Affect. Disord.* 141, 415–424. doi: 10.1016/j.jad.2012.02.043
- Harding, D., and Rouse, T. (2007). Human due diligence. *Harv. Bus. Rev.* 85, 124–131, 142
- Hobfoll, S. E. (1989). Conservation of resources: a new attempt at conceptualizing stress. *Am. Psychol.* 44, 513–524. doi: 10.1037/0003-066X.44.3.513
- Hoyle, R. H. (Ed.) (1995). Structural equation modeling: Concepts, issues, and applications. Thousand Oaks, CA, USA: Sage Publications.
- Hu, L. T., and Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: conventional criteria versus new alternatives. *Struct. Equ. Model. Multidiscip. J.* 6, 1–55. doi: 10.1080/10705519909540118
- Hultell, D., Melin, B., and Gustavsson, J. P. (2013). Getting personal with teacher burnout: a longitudinal study on the development of burnout using a person-based approach. *Teach. Teach. Educ.* 32, 75–86. doi: 10.1016/j.tate.2013.01.007
- Hwang, G. J., Rahimi, M., and Fathi, J. (2024). Enhancing EFL learners' speaking skills, foreign language enjoyment, and language-specific grit utilising the affordances of a MALL app: a microgenetic perspective. *Comput. Educ.* 214:105015. doi: 10.1016/j.compedu.2024.105015

- Iancu, A. E., Rusu, A., Măroiu, C., Păcurar, R., and Maricuțoiu, L. P. (2018). The effectiveness of interventions aimed at reducing teacher burnout: a meta-analysis. *Educ. Psychol. Rev.* 30, 373–396. doi: 10.1007/s10648-017-9420-8
- Ingersoll, R. M., and May, H. (2012). The magnitude, destinations, and determinants of mathematics and science teacher turnover. *Educ. Eval. Policy Anal.* 34, 435–464. doi: 10.1012/0162373712454326
- Ingersoll, R. M., and Strong, M. (2011). The impact of induction and mentoring programs for beginning teachers: A critical review of the research. *Rev. Educ. Res.* 81, 201–233. doi: 10.3102/0034654311403323
- Johnson, S. M., Kraft, M. A., and Papay, J. P. (2012). How context matters in high-need schools: the effects of teachers' working conditions on their professional satisfaction and their students' achievement. *Teach. Coll. Rec.* 114, 1–39. doi: 10.1177/016146811211401004
- Keller, M. M., Goetz, T., Becker, E. S., Morger, V., and Hensley, L. (2014). Feeling and showing: a new conceptualization of dispositional teacher enthusiasm and its relation to students' interest. *Learn. Instr.* 33, 29–38. doi: 10.1016/j.learninstruc.2014.03.001
- Khajavy, G. H., Ghonsooly, B., and Hosseini Fatemi, A. (2017). Testing a burnout model based on affective-motivational factors among EFL teachers. *Curr. Psychol.* 36, 339–349. doi: 10.1007/s12144-016-9423-5
- Klassen, R. M., and Chiu, M. M. (2010). Effects on teachers' self-efficacy and job satisfaction: teacher gender, years of experience, and job stress. *J. Educ. Psychol.* 102, 741–756. doi: 10.1037/a0019237
- Kline, R. B. (2023). Principles and practice of structural equation modeling. New York, NY, USA: Guilford publications.
- Köksal, O., Güler, M., Çetin, F., and Şahin, F. (2023). Proactive personality and job performance during cross-cultural service encounters: a moderated mediation model. *Balt. J. Manag.* 18, 157–172. doi: 10.1108/BJM-09-2022-0326
- Kong, L. N., Yang, L., Pan, Y. N., and Chen, S. Z. (2021). Proactive personality, professional self-efficacy and academic burnout in undergraduate nursing students in China. *J. Prof. Nurs.* 37, 690–695. doi: 10.1016/j.profnurs.2021.04.003
- Kunter, M., Frenzel, A., Nagy, G., Baumert, J., and Pekrun, R. (2011). Teacher enthusiasm: dimensionality and context specificity. *Contemp. Educ. Psychol.* 36, 289–301. doi: 10.1016/j.cedpsych.2011.07.001
- Kunter, M., Tsai, Y. M., Klusmann, U., Brunner, M., Krauss, S., and Baumert, J. (2008). Students' and mathematics teachers' perceptions of teacher enthusiasm and instruction. *Learn. Instr.* 18, 468–482. doi: 10.1016/j.learninstruc.2008.06.008
- Li, S. (2023). The effect of teacher self-efficacy, teacher resilience, and emotion regulation on teacher burnout: a mediation model. *Front. Psychol.* 14:1185079. doi: 10.3389/fpsyg.2023.1185079
- Li, M., Liu, Y., Liu, L., and Wang, Z. (2017). Proactive personality and innovative work behavior: The mediating effects of affective states and creative self-efficacy in teachers. *Curr. Psychol.* 36, 697–706. doi: 10.1007/s12144-016-9457-8
- Li, M., Wang, Z., Gao, J., and You, X. (2017). Proactive personality and job satisfaction: the mediating effects of self-efficacy and work engagement in teachers. *Curr. Psychol.* 36, 48–55. doi: 10.1007/s12144-015-9383-1
- Li, H., Xu, Z., Song, S., and Jin, H. (2024). How and when does proactive personality predict career adaptability? A study of the moderated mediation model. *Front. Psychol.* 15:1333829. doi: 10.3389/fpsyg.2024.1333829
- Liu, L., Fathi, J., Allahveysi, S. P., and Kamran, K. (2023). A model of teachers' growth mindset, teaching enjoyment, work engagement, and teacher grit among EFL teachers. *Front. Psychol.* 14:1137357. doi: 10.3389/fpsyg.2023.1137357
- Liu, G. Z., Fathi, J., and Rahimi, M. (2024). Using digital gamification to improve language achievement, foreign language enjoyment, and ideal L2 self: a case of English as a foreign language learners. *J. Comput. Assist. Learn.* doi: 10.1111/jcal.12954
- Maan, A. T., Abid, G., Butt, T. H., Ashfaq, F., and Ahmed, S. (2020). Perceived organizational support and job satisfaction: a moderated mediation model of proactive personality and psychological empowerment. *Fut. Bus. J.* 6, 1–12. doi: 10.1186/s43093-020-00027-8
- MacIntyre, P., and Mercer, S. (2014). Introducing positive psychology to SLA. *Stud. Second Lang. Learn. Teach.* 4, 153–172. doi: 10.14746/ssl.2014.4.2.2
- Madigan, D. J., and Kim, L. E. (2021). Does teacher burnout affect students? A systematic review of its association with academic achievement and student-reported outcomes. *Int. J. Educ. Res.* 105:101714. doi: 10.1016/j.ijer.2020.101714
- Maslach, C., and Jackson, S. E. (1981). The measurement of experienced burnout. *J. Organ. Behav.* 2, 99–113. doi: 10.1002/job.4030020205
- Maslach, C., Jackson, S. E., and Leiter, M. P. (1997). Maslach burnout inventory. Lanham, MD, USA: Scarecrow Education.
- Maslach, C., and Leiter, M. P. (2008). Early predictors of job burnout and engagement. *J. Appl. Psychol.* 93, 498–512. doi: 10.1037/0021-9010.93.3.498
- Maslach, C., Schaufeli, W. B., and Leiter, M. P. (2001). Job burnout. *Annu. Rev. Psychol.* 52, 397–422. doi: 10.1146/annurev.psych.52.1.397
- Meyers, L. S., Gamst, G., and Guarino, A. J. (2016). Applied multivariate research: Design and interpretation. California: Sage publications.
- Molero Jurado, M. D. M., Pérez-Fuentes, M. D. C., Atria, L., Oropesa Ruiz, N. F., and Gázquez Linares, J. J. (2019). Burnout, perceived efficacy, and job satisfaction: perception of the educational context in high school teachers. *Biomed. Res. Int.* 3:56. doi: 10.56294/r202356
- Mubarak, N., Khan, J., Yasmin, R., and Osmadi, A. (2021). The impact of a proactive personality on innovative work behavior: the role of work engagement and transformational leadership. *Leadersh. Organ. Dev. J.* 42, 989–1003. doi: 10.1108/LODJ-11-2020-0518
- Nagy, E. (2017). The road to teacher burnout and its possible protecting factors—a narrative review. *Rev. Soc. Sci.* 2, 09–15. doi: 10.18533/rss.v2i8.107
- Oliveira, S., Roberto, M. S., Veiga-Simão, A. M., and Marques-Pinto, A. (2021). A meta-analysis of the impact of social and emotional learning interventions on teachers' burnout symptoms. *Educ. Psychol. Rev.* 33, 1779–1808. doi: 10.1007/s10648-021-09612-x
- Pan, J., Liu, S., Ma, B., and Qu, Z. (2018). How does proactive personality promote creativity? A multilevel examination of the interplay between formal and informal leadership. *J. Occup. Organ. Psychol.* 91, 852–874. doi: 10.1111/joop.12221
- Pan, B., Song, Z., and Wang, Y. (2021). The relationship between preschool teachers' proactive personality and innovative behavior: the chain-mediated role of error management climate and self-efficacy. *Front. Psychol.* 12:734484. doi: 10.3389/fpsyg.2021.734484
- Parker, S. K., Wang, Y., and Liao, J. (2019). When is proactivity wise? A review of factors that influence the individual outcomes of proactive behavior. *Annu. Rev. Organ. Psych. Organ. Behav.* 6, 221–248. doi: 10.1146/annurev-orgpsych-012218-015302
- Pietarinen, J., Pyhältö, K., Haverinen, K., Leskinen, E., and Soini, T. (2021). Is individual- and school-level teacher burnout reduced by proactive strategies? *Int. J. Sch. Educ. Psychol.* 9, 340–355. doi: 10.1080/21683603.2021.1942344
- Pressley, T. (2021). Factors contributing to teacher burnout during COVID-19. *Educ. Res.* 50, 325–327. doi: 10.3102/0013189X211004138
- Pyhältö, K., Pietarinen, J., Haverinen, K., Tikkanen, L., and Soini, T. (2021). Teacher burnout profiles and proactive strategies. *Eur. J. Psychol. Educ.* 36, 219–242. doi: 10.1007/s10212-020-00465-6
- Ruzek, E. A., Hafen, C. A., Allen, J. P., Gregory, A., Mikami, A. Y., and Pianta, R. C. (2016). How teacher emotional support motivates students: the mediating roles of perceived peer relatedness, autonomy support, and competence. *Learn. Instr.* 42, 95–103. doi: 10.1016/j.learninstruc.2016.01.004
- Ryan, R. M., and Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *Am. Psychol.* 55, 68–78. doi: 10.1037/0003-066X.55.1.68
- Salmela-Aro, K., Kiuru, N., Pietikäinen, M., and Jokela, J. (2008). Does school matter? The role of school context in adolescents' school-related burnout. *Eur. Psychol.* 13, 12–23. doi: 10.1027/1016-9040.13.1.12
- Saloviita, T., and Pakarinen, E. (2021). Teacher burnout explained: teacher-, student-, and organisation-level variables. *Teach. Teach. Educ.* 97:103221. doi: 10.1016/j.tate.2020.103221
- Samfira, E. M., Dughi, T. S., and de la Fuente, J. (2023). Successful teacher: personality and other correlates. *Front. Psychol.* 14:1293759. doi: 10.3389/fpsyg.2023.1293759
- Samfira, E. M., and Paloş, R. (2021). Teachers' personality, perfectionism, and self-efficacy as predictors for coping strategies based on personal resources. *Front. Psychol.* 12:751930. doi: 10.3389/fpsyg.2021.751930
- Schaufeli, W. B., and Bakker, A. B. (2004). Job demands, job resources, and their relationship with burnout and engagement: a multi-sample study. *J. Organ. Behav.* 25, 293–315. doi: 10.1002/job.248
- Schaufeli, W. B., Bakker, A. B., and Salanova, M. (2006). The measurement of work engagement with a short questionnaire: a cross-national study. *Educ. Psychol. Meas.* 66, 701–716. doi: 10.1177/0013164405282471
- Seibert, S. E., Crant, J. M., and Kraimer, M. L. (1999). Proactive personality and career success. *J. Appl. Psychol.* 84, 416–427. doi: 10.1037/0021-9010.84.3.416
- Shang, J., and Gan, Y. (2009). Analysis of the effects of the proactive personality on graduates career decision making self-efficacy. *Acta Scientiarum Naturalium Universitatis Pekinensis (In Chinese)* 45, 548–554.
- Shen, B., McCaughy, N., Martin, J., Garn, A., Kulik, N., and Fahlman, M. (2015). The relationship between teacher burnout and student motivation. *Br. J. Educ. Psychol.* 85, 519–532. doi: 10.1111/bjep.12089
- Skaalvik, E. M., and Skaalvik, S. (2007). Dimensions of teacher self-efficacy and relations with strain factors, perceived collective teacher efficacy, and teacher burnout. *J. Educ. Psychol.* 99, 611–625. doi: 10.1037/0022-0663.99.3.611
- Skaalvik, E. M., and Skaalvik, S. (2010). Teacher self-efficacy and teacher burnout: a study of relations. *Teach. Teach. Educ.* 26, 1059–1069. doi: 10.1016/j.tate.2009.11.001
- Skaalvik, E. M., and Skaalvik, S. (2017). Dimensions of teacher burnout: relations with potential stressors at school. *Soc. Psychol. Educ.* 20, 775–790. doi: 10.1007/s12128-017-9391-0
- Spitzmuller, M., Sin, H. P., Howe, M., and Fatimah, S. (2015). Investigating the uniqueness and usefulness of proactive personality in organizational research: a meta-analytic review. *Hum. Perform.* 28, 351–379. doi: 10.1080/08959285.2015.1021041

- Stein, R., Garay, M., and Nguyen, A. (2024). It matters: early childhood mental health, educator stress, and burnout. *Early Childhood Educ. J.* 52, 333–344. doi: 10.1007/s10643-022-01438-8
- Taxer, J. L., Becker-Kurz, B., and Frenzel, A. C. (2019). Do quality teacher–student relationships protect teachers from emotional exhaustion? The mediating role of enjoyment and anger. *Soc. Psychol. Educ.* 22, 209–226. doi: 10.1007/s11218-018-9468-4
- Tilga, H., Kalajas-Tilga, H., Hein, V., Raudsepp, L., and Koka, A. (2021). Effects of a web-based autonomy-supportive intervention on physical education teacher outcomes. *Educ. Sci.* 11:316. doi: 10.3390/educsci11070316
- Van der Heijden, B. I., Van Vuuren, T. C., Kooij, D. T., and de Lange, A. H. (2015). Tailoring professional development for teachers in primary education: the role of age and proactive personality. *J. Manag. Psychol.* 30, 22–37. doi: 10.1108/JMP-07-2014-0211
- Verešová, M., and Malá, D. (2012). Stress, proactive coping and self-efficacy of teachers. *Procedia Soc. Behav. Sci.* 55, 294–300. doi: 10.1016/j.sbspro.2012.09.506
- Wang, S., Mei, M., Xie, Y., Zhao, Y., and Yang, F. (2021). Proactive personality as a predictor of career adaptability and career growth potential: a view from conservation of resources theory. *Front. Psychol.* 12:699461. doi: 10.3389/fpsyg.2021.699461
- Wei, R., Yang, X., and Wang, J. (2023). Do teachers' well-being and resilience predict their foreign language teaching enjoyment (FLTE)? *Appl. Linguist. Rev.* 15, 2515–2536. doi: 10.1515/applirev-2022-0115
- Wen, Y., Liu, F., Pang, L., and Chen, H. (2022). Proactive personality and career adaptability of Chinese female pre-service teachers in primary schools: the role of calling. *Sustain. For.* 14:4188. doi: 10.3390/su14074188
- Wu, W., Wang, Y., and Huang, R. (2023). Teachers matter: exploring the impact of perceived teacher affective support and teacher enjoyment on L2 learner grit and burnout. *System* 117:103096. doi: 10.1016/j.system.2023.103096
- Xanthopoulou, D., Bakker, A. B., Demerouti, E., and Schaufeli, W. B. (2007). The role of personal resources in the job demands-resources model. *Int. J. Stress Manag.* 14:121. doi: 10.1037/1072-5245.14.2.121
- Xanthopoulou, D., Bakker, A. B., Demerouti, E., and Schaufeli, W. B. (2009). Reciprocal relationships between job resources, personal resources, and work engagement. *J. Vocat. Behav.* 74, 235–244. doi: 10.1016/j.jvb.2008.11.003
- Xiao, Y., Fathi, J., and Mohammaddokht, F. (2022). Exploring a structural model of teaching enjoyment, teacher self-efficacy, and work engagement. *Front. Psychol.* 13:918488. doi: 10.3389/fpsyg.2022.918488
- Xie, Q., King, R. B., and Cai, Y. (2023). Emotional contagion: a cross-cultural exploration of how teachers' enjoyment facilitates achievement via students' enjoyment. *Curr. Psychol.* 42, 15907–15910. doi: 10.1007/s12144-022-02878-6
- Yang, Y., and Ling, Q. (2023). The influence of existence-relatedness-growth need satisfaction and job burnout of young university teachers: the mediating role of job satisfaction. *Front. Psychol.* 14:1205742. doi: 10.3389/fpsyg.2023.1205742
- Zhang, L. J., Fathi, J., and Mohammaddokht, F. (2023a). Predicting teaching enjoyment from teachers' perceived school climate, self-efficacy, and psychological wellbeing at work: EFL teachers. *Percept. Mot. Skills* 130, 2269–2299. doi: 10.1177/00315125231182269
- Zhang, L. J., Fathi, J., and Naderi, M. (2023b). A cross-lagged panel analysis of self-efficacy, teacher grit, teaching enjoyment, and work engagement among foreign language teachers. *J. Multiling. Multicult. Dev.* 1–19, 1–19. doi: 10.1080/01434632.2023.2248064
- Zhang, Q., Li, X., and Gamble, J. H. (2022). Teacher burnout and turnover intention in higher education: the mediating role of job satisfaction and the moderating role of proactive personality. *Front. Psychol.* 13:1076277. doi: 10.3389/fpsyg.2022.1076277
- Zhao, N., Huo, M., and Van Den Noortgate, W. (2023). Exploring burnout among preschool teachers in rural China: a job demands-resources model perspective. *Front. Psychol.* 14:1253774. doi: 10.3389/fpsyg.2023.1253774



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EDITED BY

María del Mar Molero Jurado,
University of Almería, Spain

REVIEWED BY

Ana Mercedes Vernia-Carrasco,
University of Jaume I, Spain
Cuong Huy Pham,
Ho Chi Minh City University of Economics
and Finance, Vietnam

*CORRESPONDENCE

MinXuan Shi
✉ smx6613@163.com

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Social media use and job choices: the mediating roles of work values and self-efficacy

Fei Li¹, MinXuan Shi^{2*} and Ran Feng²

¹School of Humanities, Anhui Polytechnic University, Wuhu, Anhui, China, ²School of Public
Administration, Hohai University, Nanjing, Jiangsu, China

This study examines the association between social media use and college students' employment choices, focusing on the roles of work values and self-efficacy as mediating factors. A survey of 254 college students in Anhui Province showed that social media users tended to have more flexible and diverse employment options than non-users. Regression analyses demonstrated a positive association between social media use and employment decisions, with work values and self-efficacy identified as mediating factors in this relationship. Notably, self-efficacy was found to enhance the association between work values and students' employment choices. These findings suggest that fostering students' self-efficacy enhances the positive impact of work values, emphasizing the need for career guidance to encourage appropriate use of social media while avoiding over-reliance. This study provides valuable insights into promoting full employment among college students by considering the role of social media in shaping their career decisions.

KEYWORDS

social media, college students, job choices, work values, self-efficacy

1 Introduction

In recent years, the rapid advancement of the Internet and mobile communication technologies has positioned social media as a central component of college students' daily lives. Social media has not only transformed communication practices but has also significantly impacted the processes of information acquisition and processing. Numerous studies have demonstrated that social media exerts a substantial impact on individuals' career development and employment decisions (Ostic et al., 2021; Nikitkov and Sainty, 2014). As a primary user group of social media, the work values and career choices of 90s and 00s college students significantly relate to these platforms. In today's job market, college students increasingly rely on social media to gather background information on potential employers, enabling them to effectively align recruitment opportunities with their personal career goals and needs (Gershon, 2024). Therefore, social media functions not only as a channel for information dissemination but also as a tool for corporate impression management. This evolving employment landscape has prompted college students to carefully consider their performance and interactions on social platforms during their job search. Additionally, success stories and corporate culture representations on social media subtly shape college students' work values. Work values encompass the intrinsic principles and expectations that individuals prioritize when selecting employment, including factors such as job stability, career advancement opportunities, compensation, and social recognition (Shi et al., 2023).

Sharing experiences related to career fulfillment and work-life balance on social media platforms may inspire college students to reassess traditional employment concepts and explore more diverse career paths. The concept of work and employment choice conflict refers to the dilemma individuals face when choosing between various career roles, given limited

time and resources. Pursuing one career objective often necessitates the sacrifice of another, leading to conflict in decision-making (Ma et al., 2014). Today's college students may be just entering the workforce or may be in the exploratory stage of their careers. While pursuing well-paying jobs and social recognition, they may forgo the opportunity to pursue a combination of work and interest, or even choose to abandon certain career paths (Lowe, 2021). Social learning theory states that individuals learn and form their own behavioral patterns by observing the behaviors, attitudes, and consequences of others (Bandura and Walters, 1977). This theory is especially applicable in a social media environment. College students form or adjust their work values and career choices by observing the life status and career development of professionally successful individuals on social media. In addition, the display of career information and the career dynamics of their peers on social media may lead them to value specific career attributes, such as creativity, flexibility, or high income (Ruparel et al., 2020; Jue et al., 2009). However, the direct financial benefits of pursuing a high-income position are obvious, but may be accompanied by a significant time and mental commitment, making it impossible for individuals to find a balance between work and personal life (Szromek and Wolniak, 2020). This imbalance leads to the rational consumption theory of employment choice, where individuals follow a rational balance of utility and cost in their employment behavior (Fischer et al., 2021). While the benefits of career development are often long-term and less immediately apparent, the associated costs—such as time, opportunity costs, and psychological stress—are immediate and visible. Furthermore, the distinct characteristics of social media use, coupled with specific economic and cultural contexts, are particularly pronounced in China. Through social media observation and learning, college students may experience “expectation pressure” in the job market, driven by societal definitions of “success,” which can result in skewed or biased employment choices (Xu, 2023). As a result, some university students opt to delay entry into the workforce, progress at a slower pace, or alter their career trajectories in pursuit of professions that align more closely with their interests and personal values (Lent and Brown, 2020).

As society progresses and living standards improve, the costs associated with pursuing career satisfaction and personal development have correspondingly increased. These costs extend beyond financial investments to include emotional commitment, the cultivation of professional values, and the development of personal skills and interests. Consequently, college students often struggle to balance their career aspirations with their personal lives, leading to a diminished preference for traditional career paths, particularly those that demand long working hours and high levels of dedication (Kossek et al., 2021).

2 Review of literature

2.1 Social media impact: a social learning theory perspective

In the digital age, social media has emerged as a powerful platform that fundamentally transforms how individuals learn, interact, and make decisions. Through the Social Learning Theory, we can comprehensively understand the profound impacts of social media on human behavior and societal dynamics. Social Learning Theory, developed by Bandura,

emphasizes learning through the observation of others' actions and their outcomes. This theory is centered around four core concepts: observational learning, imitation, self-efficacy, and reinforcement mechanisms (Rumjaun and Narod, 2020). Social media offers a dynamic and evolving platform for the application of Social Learning Theory, where users can acquire new skills, behaviors, and knowledge by watching content (e.g., videos, pictures, and posts) posted by others (Huang and Chang, 2020). With the global rise of social media, its relevance on learning, knowledge sharing, and business value creation has garnered significant attention. In recent years, researchers have analyzed how social media influences individual and organizational learning behaviors and performance from various perspectives. Hosen et al. (2021) examined the impact of individual motivation and social media on students' knowledge sharing and learning outcomes, revealing that social media significantly enhances learning performance by fostering interaction and knowledge exchange among students. This finding underscores the pivotal role of social media platforms in facilitating observational learning and imitation, enabling students to observe and replicate the learning behaviors of others, thereby improving their own learning outcomes (Hosen et al., 2021). Ansari and Khan (2020) explored the role of social media in collaborative learning, noting that social media platforms provide students with an interactive and collaborative environment that facilitates knowledge sharing and co-creation. This is in line with the concept of collaborative learning in social learning theory, whereby by interacting with peers and teachers on social media, students are able to access different sources of knowledge and learning strategies to enhance the depth and breadth of their learning (Ansari and Khan, 2020). Zafar et al. (2021) analyzed the impact of social media celebrities' posts and contextual interactions on impulse buying behavior in social commerce and found that social media celebrities' recommendation and display behaviors are significantly related to consumers' purchase decisions through observational learning and imitation. This suggests that by imitating influential individuals, users' behaviors and decisions are strongly related to each other, further validating the application of social learning theory to consumer behavior (Zafar et al., 2021). Zhang et al. (2020) investigated how co-creation between customers and businesses through social media drives business value, adopting an organizational learning and social capital perspective. The study found that through social media platforms, customers and firms can exchange and share knowledge and information, facilitating organizational learning and social capital accumulation (Zhang et al., 2020). This is consistent with the social learning theory of observational and interactive learning, whereby by observing and mimicking customer needs and feedback, firms are able to continuously optimize their products and services to achieve business value. Finally, Sun and Zhang (2021) reviewed the various theories and models applied in social media addiction research and made suggestions for future research. The article points out that social learning theory is important in explaining social media addictive behavior. By observing the usage behavior of others, users may imitate and gradually develop a dependence on social media (Sun and Zhang, 2021). In summary, these studies collectively highlight the significant role of social media in knowledge sharing, collaborative learning, consumer behavior, and organizational learning through the Social Learning Theory. By enabling observation, imitation, and interaction, social media platforms enhance both individual and organizational learning. Future research could delve deeper into the social learning processes across various social media platforms and user groups, offering fresh insights and data to advance theory and practice.

2.2 Self-efficacy

Self-Efficacy refers to an individual's belief in his or her ability to accomplish a specific task or cope with a specific situation. Developed by Albert Bandura in 1977, the concept emphasizes an individual's self-confidence and ability to perform in the face of challenges and has quickly become an important part of social cognitive theory (Calicchio, 2023). In recent years, with the popularity of social media, researchers have begun to explore the impact of social media on self-efficacy, particularly in the areas of work, health information access, knowledge sharing, and consumer behavior. Pekkala and van Zoonen (2022) examined the relationship between work-related social media use and social media communication self-efficacy. The study found that social media use in work scenarios can contribute to employees' productivity and career satisfaction by enhancing their social media communication self-efficacy (Pekkala and van Zoonen, 2022). This suggests that social media as a communication tool can enhance employees' self-efficacy and communication skills in a professional setting, thereby improving job performance (Ashaye et al., 2023). Niu et al. (2021) explored the association between health literacy, social media use and self-efficacy with health information acquisition intentions. Through a cross-sectional survey of Chinese social media users, it was found that self-efficacy played a mediating role in the health information acquisition process. High levels of health literacy and frequency of social media use could further increase users' intention to actively acquire health information by enhancing their self-efficacy (Niu et al., 2021). Alshahrani and Rasmussen Pennington (2020) investigated the role of self-efficacy and its sources in social media knowledge sharing. The study showed that social media platforms facilitate knowledge sharing, while users' self-efficacy is significantly related to their willingness to engage in knowledge sharing on these platforms. Through the interaction and feedback mechanisms of social media, users can enhance their self-efficacy and then actively participate in knowledge sharing activities (Alshahrani and Rasmussen Pennington, 2020). Tajurrahim et al. (2020) explored the effects of consumer education intensity, self-efficacy, personality traits and social media on consumer empowerment. The study found that self-efficacy played a key role in the impact of consumer education and social media use on consumer empowerment. Specifically, social media empowers consumers by increasing their self-efficacy and enhancing their self-confidence and independence in consumer decision-making (Tajurrahim et al., 2020). Huang and Zhang (2020) examined the relationship between social media use and entrepreneurial intentions and explored the mediating role of self-efficacy. It was found that social media use can significantly increase an individual's entrepreneurial intentions by enhancing their self-efficacy (Huang and Zhang, 2020). This suggests that social media provides a platform for potential entrepreneurs to access resources, network, and obtain feedback, thereby increasing their entrepreneurial self-efficacy and action.

2.3 Work values

In recent years, research on the work values of college students has been explored in depth in different contexts. Ling et al. (2021) examined the employment of Chinese college students during a major public health event and found that the impact of the outbreak on the job market led students to focus more on the stability and security of

their employment (Ling et al., 2021). Davidovitch et al. (2023), on the other hand, focused on the autism spectrum college graduates' employment choices and labor market integration, noting the importance of inclusivity and equity in work values (Davidovitch et al., 2023). Perna's (2023) edited volume *Understanding the Working College Student* summarizes current research on working college students, highlighting the positive impact of work experience on college students' career development that It also reflects students' values in balancing academics and work (Perna, 2023). Jackson and Tomlinson's (2020) study showed that career planning and initiative play an important role in enhancing higher education students' perceptions of employment under uncertain labor market conditions, which reflects students' positive attitudes toward their future careers and values of self-efficacy (Jackson and Tomlinson, 2020). McCormick et al. (2023) explored the impact of working during college on student engagement and educational outcomes, further revealing how working college students enhance their skills and employability through work practice, leading to pragmatic and practical experience-focused work values (McCormick et al., 2023). Taken together, these studies reveal the diversity and complexity of university students' work values in different contexts, emphasizing the centrality of stability, security, fairness, self-efficacy and practical experience in them.

3 Research hypotheses

In this study, we propose a series of hypotheses to explore the potential associations between social media use and college students' job choices. Drawing from existing literature, we explore the complex interrelationships among social media usage, work values, self-efficacy, and career decision-making processes.

3.1 Social media use and college students' work values

Work values are defined as the beliefs, attitudes, and priorities that guide individuals when making career choices, such as job stability, career advancement, and work-life balance (Munn, 2013). Previous research has shown that social media can be associated with college students' career expectations and job choices by providing information, fostering social networks, and enhancing personal identity and sense of belonging (Gati and Kulcsár, 2021). Studies indicate that social media platforms may be positively related to students' work values by offering access to relevant information, opportunities for networking, and even shaping their understanding of career goals (Abessolo et al., 2021; Waworuntu et al., 2022; Heidari et al., 2023; Shujaat et al., 2021; Nayak et al., 2020). Based on these findings, we propose that Social media use is positively associated with college students' work values.

Hypothesis 1: Social media use is positively associated with college students' work values.

3.2 The mediating effect of work values

Work values are crucial drivers of an individual's professional behavior and decision-making process (Sulistiobudi and Hutabarat,

2022; Ma et al., 2021; Wang and Li, 2022). Research shows that work values are associated with how college students assess different career opportunities, including how they prioritize factors such as job stability, career development opportunities, and work-life balance. Previous studies have demonstrated that work values are related to job choices by guiding individuals in evaluating available job opportunities (Perna, 2023; Huang et al., 2020). Therefore, it is hypothesized that work values mediate the association between social media use and job choices. Specifically, social media usage may be associated with work values, which in turn are associated with students' final job choices.

Hypothesis 2: College students' work values mediate the positive association between social media use and their job choices.

3.3 The mediating effect of self-efficacy

Self-efficacy refers to an individual's belief in their ability to accomplish tasks and achieve goals. High self-efficacy is linked to increased confidence and better decision-making skills, particularly in career-related contexts. Research suggests that self-efficacy may play a role in shaping job choices, especially by reinforcing work values. When students have high self-efficacy, they are more likely to pursue careers aligned with their values, such as seeking out positions that offer job satisfaction, stability, and opportunities for growth (Wei et al., 2020). Studies have demonstrated that self-efficacy serves as a mediator between work values and job choices, as it helps students make more informed and confident decisions. Therefore, it is proposed that self-efficacy mediates the association between college students' work values and their job choices.

Hypothesis 3: Self-efficacy mediates the positive association between college students' work values and their job choices.

3.4 The interaction between work values and self-efficacy

There is a complex interaction between work values and self-efficacy, with each being associated with the other. Research has shown that work values can enhance self-efficacy by influencing how students approach their career decisions, thereby boosting their self-efficacy and career confidence. Similarly, self-efficacy can strengthen the importance of work values by improving students' perception of their career potential. This mutually reinforcing relationship may be amplified by social media, which serves as a platform for acquiring career information, establishing professional networks, and receiving social support. Therefore, the interaction between work values and self-efficacy may act as a mediator in the association between social media use and job choices, helping students make better career decisions.

Hypothesis 4: The interaction of work values and self-efficacy mediates the positive association between social media use and college students' job choices.

3.5 Social media use and college students' job choices

Social media platforms play an increasingly significant role in the career paths of college students. They serve not only as communication tools but also as key resources for career planning and decision-making. Through social media, students can access the latest information on job openings, career trends, and industry news. These platforms allow them to connect with potential employers, build professional networks, and stay informed about job opportunities. Research has consistently found that social media use is positively associated with students' job choices by expanding their access to employment resources and enhancing their career awareness. Based on these findings, we propose that social media use is positively associated with college students' job choices.

Hypothesis 5: Social media Use is positively associated with the job choices of college students.

To summarize, this study added the factors of work values as well as self-efficacy on social media and job choice, and constructed a chain mediation model as shown in Figure 1.

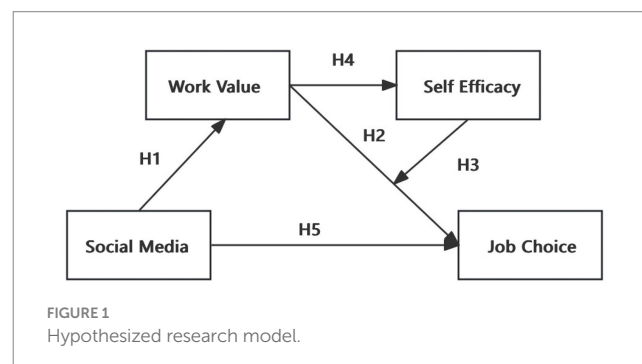
4 Method

4.1 Participants

The sample for this study consisted of 254 college students from two universities in Anhui Province, selected through random sampling. The participants were aged 22.35 ± 2.14 years, with 105 male students and 149 female students. The sample size was determined based on *a priori* power analysis conducted using GPower 3.1, which recommended a minimum of 210 participants to achieve statistical validity ($\alpha = 0.05$, power = 0.95). A total of 254 valid responses were obtained, resulting in a response rate of 98.7%.

4.2 Data collection

Data were collected through an online survey administered via the Question-Star platform. The survey was distributed in a classroom setting with the approval of the university's teaching authority. The data collection process was carried out during students' self-study sessions, allowing for approximately 15 min of survey time. Before



completing the survey, students were informed of the study's purpose, confidentiality, and the voluntary nature of their participation. The survey was designed to capture information on students' social media use, work values, self-efficacy, and job choices.

4.3 Measures

Several scales were used to measure the key variables in this study.

Social media use: social media usage was measured based on three dimensions: frequency of use, duration of use, and level of interaction. A composite score was calculated using the formula:

$$\text{Usage} = \text{frequency} \times \text{duration} \times \text{interaction level}.$$

The scale had a maximum score of 100, and the Cronbach's α for this scale was 0.88, indicating good reliability (Ozimek et al., 2023).

Work values: the work values scale consisted of eight items measuring six key dimensions: career fulfillment, job satisfaction, career development opportunities, work-life balance, work environment, and salary. Higher scores indicated greater importance placed on these dimensions when making career decisions. The Cronbach's α for this scale was 0.83 (Avalone et al., 2010).

Job choice: job choice was measured using a scale consisting of 10 items, which covered six dimensions: career development opportunities, work environment, salary, career stability, work-life balance, and work interest. Higher scores indicated greater importance placed on these factors when choosing a job. The Cronbach's α for this scale was 0.85 (Nadarajah et al., 2022).

Self-efficacy: the self-efficacy scale included 10 items across six dimensions: self-esteem, self-confidence, personal growth, social support, emotional regulation, and goal setting. Higher scores on this scale reflected stronger self-efficacy. The Cronbach's α for this scale was 0.86 (Bandura, 2006).

4.4 Data analysis

The data were analyzed using multiple regression and bootstrap methods to test the mediation effects of work values and self-efficacy. Specifically, we tested the association between social media use and job choices, considering the role of work values and self-efficacy as mediators. To ensure robust results, a bootstrapping method was used to verify the significance of indirect associations. The analysis was conducted using SPSS and PROCESS macro to estimate the mediation effects and test the hypotheses proposed in this study.

Through this analysis, we aim to explore the potential associations between social media usage and college students' employment choices,

examining the intricate relationships involving work values and self-efficacy. The findings will contribute to the literature on social media use and job choices, and provide practical implications for career guidance and policy-making (Wang and Yang, 2014).

5 Results

5.1 Descriptive statistics

Correlation analysis showed (Table 1) Social media use is significantly and positively associated with work values among college students ($r = 0.175, p < 0.01$) and with self-efficacy ($r = 0.210, p < 0.01$). Work values (defined operationally as beliefs and priorities such as job stability, career advancement, and work-life balance) are significantly and positively related to self-efficacy ($r = 0.198, p < 0.01$). As the frequency of social media use increased among college students, their work values and sense of self-empowerment also showed a corresponding increase. In addition, work values were significantly and positively related to employment choices ($r = 0.322, p < 0.01$) and significantly positively correlated with self-efficacy ($r = 0.289, p < 0.01$). When individuals' work values are higher, they are more inclined to value personal development and career fulfillment in their employment choices. Meanwhile, when individuals' sense of self-efficacy increases, they are more confident and decision-making when making employment choices.

5.2 The association between social media use and job choices: a regression analysis of work values and self-efficacy

In order to explore the associations between social media use, work values, and self-efficacy with employment choice, on the basis of correlation analysis, regression analysis was conducted with the former three as independent variables and employment choice as the dependent variable. The specific statistical results are shown in Table 2. As can be seen from Table 2, the independent variable that enters into the regression equation in Model 1 is social media use, and there is a significant positive association of social media use with employment choice ($\beta = 0.322, t = 5.112, p < 0.01$), and its explained amount is 10.4%; after the inclusion of work values into the regression equation in model 2, there is a significant positive association of work values with employment choice ($\beta = 0.289, t = 6.253, p < 0.01$), and the joint explained variance (R^2) of social media use and work values is 16.5%, of which The amount of explained variance (ΔR^2) of work values is 6.1%; after self-efficacy is again included in the regression equation in model 3, there is a

TABLE 1 The mean value, standard deviation and relevant statistical results of each variable.

Variable	<i>M</i>	SD	1	2	3
Social media	35.42	12.85			
Employment choices	82.56	14.78	0.175**		
Self-efficacy	45.32	10.24	0.210**	0.198**	
Work values	60.14	11.52	0.322**	0.289**	0.276**

* indicates $p < 0.05$, ** indicates $p < 0.01$, $N = 254$.

TABLE 2 The regression analysis results of social media use, work values, and self-efficacy on employment choices.

Independent variables	Employment choices $\beta(1)$	$t(1)$	Employment choices $\beta(2)$	$t(2)$	Employment choices $\beta(3)$	$t(3)$
Social media use	0.322	5.112**	0.118	3.989**	–	–
Work values	–	–	0.289	6.253**	–0.259	8.851**
Self-efficacy	–	–	–	–	0.372	7.512**
R^2	0.104		0.165		0.284	
ΔR^2	10.104		0.061		0.119	
F	26.145**		45.372**		33.071**	

* indicates $P < 0.05$, ** indicates $P < 0.01$, $N = 254$.

TABLE 3 Results of intermediary analyses.

Influence path	Effect	Boot standard error	Boot 95%CI lower	Boot 95%CI upper	Relative mediated effect
Ind1	0.0152	0.0030	0.0100	0.0204	15.97%
Ind2	0.0346	0.0055	0.0220	0.0472	36.37%
Ind3	0.0024	0.0014	0.0010	0.0038	2.52%
Total indirect effect	0.0231	0.0087	0.0120	0.0342	54.86%

significant positive association of self-efficacy with employment choice ($\beta = 0.372$, $t = 7.512$, $p < 0.01$), and the amount of jointly explained variance (R^2) of the three variables on employment choice is 28.4%, of which, the amount of explained variance (ΔR^2) of self-efficacy is 11.9%, and the individual explanations added by each independent variable into the regression model reached significance. These results suggests that social media use may be associated with employment choice through work values and self-efficacy.

5.3 Intermediation analysis

Based on the mediation effect testing process proposed by Zhonglin and Baojuan (2014). In the first step, the coefficient c of social media use on employment choice was tested ($c = 0.322$, $t = 5.112$, $p < 0.01$), and the mediation effect between social media use and employment choice was established. In the second step, the coefficients $a_1 = 0.175$, $a_2 = 0.210$; coefficients $b_1 = 0.289$, $b_2 = 0.372$ were tested sequentially; all four coefficients were significant and the indirect effect was significant. In the third step, in order to examine the chain mediation effect (reorganized for clarity as described in the discussion) of work values and self-efficacy, the Bootstrap method was used to conduct the chain mediation effect (reorganized for clarity as described in the discussion) test, the test method model selection 6, the sample size selection 5,000, to see whether the mediation effect is significant under the 95% confidence interval, and the test results show that (Table 3): (1) The mediating effect value for work values was 0.0152, and its 95% CI is [0.0100, 0.0204]; (2) the mediation effect size of self-efficacy was 0.0346, with a 95% CI of [0.0220, 0.0472]; and (3) the chained mediation effect value of the two was 0.0024, with a 95% CI of [0.0010, 0.0038]. The intervals of the above three paths do not include 0, indicating that each mediating effect is significant. Further decomposing the effect size of each variable on employment choice, the direct effect of social media use to employment choice was 0.0721, the total indirect effect value of 0.0231 was the sum of the mediating

effects of the 3 mediating paths, and the sum of the direct effect and the total indirect effect was the total effect of 0.0952. The value of each mediating effect was divided by the total effect as the effect size. The effect shares of the three mediating paths in this paper are 15.97, 36.37, and 2.52%, respectively.

The study shows that when social media use changes by one standard deviation, employment choice will change by 0.0952 standard deviations. Among them, 0.0231 standard deviations were generated by indirect mediating effects, the mediating effect of work values produced a facilitating effect, which accounted for 15.97% of the total indirect effect, while the mediating effect of self-efficacy played a positive facilitating effect, which accounted for 36.37% of the total effect, and the interaction between the two also played a positive facilitating effect, which accounted for 2.52% of the total effect. Comparing the mediating effects of the three different paths, the results showed that, as far as the sole mediating effect was concerned, the positive effect of self-efficacy was significantly higher than that of work values ($E = 0.0194$, $LLCI = 0.0120$, $ULCI = 0.0268$). Their chained mediation effects were all lower than their respective stand-alone mediation effects, and there was a significant difference between them and the mediation effect of work values ($E = -0.0076$, $LLCI = -0.0120$, $ULCI = -0.0032$), and a significant difference between them and the mediation effect of self-efficacy ($E = 0.0122$, $LLCI = 0.0064$, $ULCI = 0.0180$).

6 Discussion and conclusion

The purpose of this study was to explore the associations between social media use and college students' career choices and to analyze the roles of work values and self-efficacy through a chain mediation model. Based on the data analysis of 254 college students, regression analysis and Bootstrap test revealed several important findings. These results highlight the potential associations between social media use

and career choice, and they underscore the relationships of work values and self-efficacy as important factors in this process.

6.1 Direct association of social media use with job choice

The study found that there is a significant positive correlation between the frequency of social media use and the job choice of college students. Specifically, the coefficient of the direct association was 0.322, with a *t*-value of 5.112 and a *p*-value of less than 0.001. This suggests that increased social media use is positively associated with flexibility and diversity in job choice. Hypotheses 1 and 5 were supported, and this result is consistent with the existing literature, emphasizing the important contribution of social media in the job decision-making process of contemporary college students. Social media provides students with a wealth of information and resources to better understand various job opportunities and their requirements. By interacting with career experts, alumni, and peers, students can gain valuable career guidance and advice (Austin, 2002). In addition, social media provides a platform for students to showcase their abilities and achievements, enhancing their competitiveness in the job market. These factors work together to make students with higher frequency of social media use show greater diversity and flexibility in their job choices.

6.2 Mediating effects of work values and self-efficacy

In addition to the direct association, the study found that the relationship between social media and job choice was further explained through the mediating role of work values and self-efficacy. In the chain mediation model, the total contribution of social media use on job choice was 0.0952, of which the direct effect was 0.0721 and the indirect effect was 0.0231, and both were statistically significant. Specifically, social media is related to job choice indirectly by enhancing work values and self-efficacy. The mediating effect of work values was 0.0152, accounting for 15.97% of the total effect; the mediating effect of self-efficacy was 0.0346, accounting for 36.37%; and the interaction effect of work values and self-efficacy was 0.0024, accounting for 2.52%. These results suggest that social media not only affects job choice directly but also works indirectly by influencing students' work values and self-efficacy.

Work values (which in this study refers to beliefs and priorities about job stability, career development opportunities, and work-life balance) reflect an individual's understanding of the meaning and importance of work, which in turn directly associates with his or her job choices and occupational behaviors. Social media enables students to be exposed to a diversity of work values and role models, thus helping them to form and strengthen their personal work values (Tess, 2013). On the other hand, self-efficacy is the process of increasing self-confidence through positive self-evaluation, and social media, as a platform for displaying personal accomplishments, helps to enhance students' self-identity, enabling them to show more confidence and determination in their job choices.

In order to verify the chain mediation effect of work values and self-efficacy, this study used the Bootstrap method with a sample size

of 5,000 and a significance test with a 95% confidence interval. The results showed that the mediating effect of work values was 0.0152 with a 95% confidence interval of [0.0100, 0.0204]; the mediating effect of self-efficacy was 0.0346 with a 95% confidence interval of [0.0220, 0.0472]; and the interaction effect of work values and self-efficacy was 0.0024 with a 95% confidence interval of [0.0010, 0.0038]. Since none of these confidence intervals contained zero, all mediating effects were statistically significant. Thus, hypotheses 2, 3, and 4 were supported, further validating the indirect association of social media use with job choice and the critical role of work values and self-efficacy in this process.

6.3 Conclusion

The findings of this study offer valuable theoretical and practical insights. Theoretically, it enhances the understanding of the associations between social media use, work values, self-efficacy, and job choice, revealing the complex interrelationships among these variables (Hartman and Barber, 2020). This research expands the theoretical framework on the role of social media in career decision-making and offers new directions for future studies.

Practically, the findings provide guidance for educators, career counselors, and universities. Educators should incorporate social media literacy into curricula to help students navigate reliable career information. Career counselors should focus on strengthening students' work values and self-efficacy, enabling more informed and confident job decisions (Falco et al., 2019). Universities should leverage social media for career awareness and networking, while teaching students to critically assess online information to ensure well-informed choices.

In conclusion, this study underscores the critical relevance of social media use, work values, and self-efficacy on college students' job choices, suggesting that vocational education should consider the impact of social media. Future research can further explore these mechanisms across diverse groups and cultural contexts, providing deeper insights into the role of digital platforms in modern career development.

7 Limitation and future research

Despite some valuable results from this study, there are some limitations. First, this study used cross-sectional data, which did not allow for the identification of causal relationships. Future research could use a longitudinal design to further validate the causal relationship between social media use, work values, self-efficacy, and employment choices. Second, the sample of this study was from college students in a specific region, and the generalizability of the results may be limited. Future research could expand the sample to verify the generalizability of the results. Future studies can also explore other potential mediating variables, such as social support and career adaptability, to further enrich the theoretical framework of the impact of social media use on employment choice. In addition, the study can also focus on the different effects of different types of social media (e.g., professional social media, entertainment social media) on employment choice, to gain a deeper understanding of the mechanism of social media's role in career decision-making.

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 on human participants in accordance with the local legislation and institutional requirements. Written informed consent from the patients/participants or patients/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

FL: Conceptualization, Project administration, Data curation, Funding acquisition, investigation, Methodology, Software, Writing – original draft, Writing – review & editing. MS: Formal analysis, Methodology, Project administration, Supervision, Validation, Writing – original draft, Writing – review & editing. RF: Formal analysis, Supervision, Validation, Visualization, 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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References

- Abessolo, M., Hirschi, A., and Rossier, J. (2021). Development and validation of a multidimensional career values questionnaire: a measure integrating work values, career orientations, and career anchors. *J. Career Dev.* 48, 243–259. doi: 10.1177/0894845319846567
- Alshahrani, H., and Rasmussen Pennington, D. (2020). “How to use it more?” self-efficacy and its sources in the use of social media for knowledge sharing. *J. Doc.* 76, 231–257. doi: 10.1108/JD-02-2019-0026
- Ansari, J. A. N., and Khan, N. A. (2020). Exploring the role of social media in collaborative learning the new domain of learning. *Smart Learn. Environ.* 7:9. doi: 10.1186/s40561-020-00118-7
- Ashaye, O. R., Mahmoud, A. B., Munna, A. S., and Ali, N. (2023). The role of social media engagement and emotional intelligence in successful employment. *High. Educ. Ski. Work Based Learn.* 13, 315–337. doi: 10.1108/HESWBL-07-2022-0158
- Austin, A. E. (2002). Preparing the next generation of faculty: graduate school as socialization to the academic career. *J. High. Educ.* 73, 94–122. doi: 10.1080/00221546.2002.11777132
- Avallone, F., Farnese, M. L., Pepe, S., and Vecchione, M. (2010). The work values questionnaire (WVQ): revisiting Schwartz's portrait values questionnaire (PVQ) for work contexts. *Bollettino di Psicol. Applicata* 261, 59–75.
- Bandura, A. (2006). Guide for constructing self-efficacy scales. *Self Effic. Belief. Adolesc.* eds. T. Urdan and F. Pajares (Greenwich, CT: Information Age Publishing) 5, 307–337.
- Bandura, A., and Walters, R. H. (1977). Social learning theory, vol. 1. Englewood Cliffs, NJ: Prentice Hall, 141–154.
- Calicchio, S. (2023). Albert Bandura and the self-efficacy factor: a journey into the psychology of human potential through the understanding and development of self-efficacy and self-esteem: Stefano Calicchio.
- Davidovitch, N., Krause, Y., Ben Shoham, R., Ponomareva, A., and Guterman, H. G. (2023). Students' attitudes to the employment options of college graduates on the autistic Spectrum and their integration in the labor market. *Educ. Soc.* 41, 31–48. doi: 10.7459/es/41.2.03
- Falco, L. D., and Summers, J. J. (2019). Improving career decision self-efficacy and STEM self-efficacy in high school girls: Evaluation of an intervention. *J. Career Dev.* 46, 62–76. doi: 10.1177/0894845317721651
- Fischer, P. A., Martin, R., and Straubhaar, T. (2021). “Should I stay or should I go?” in International migration, immobility and development. eds. T. Hammar, G. Brochmann, K. Tamas and T. Faist (London: Routledge).
- Gati, I., and Kulcsár, V. (2021). Making better career decisions: from challenges to opportunities. *J. Vocat. Behav.* 126:103545. doi: 10.1016/j.jvb.2021.103545
- Gershon, I. (2024). Down and out in the new economy: how people find (or don't find) work today. *Univ. Chicago Press.* 42, 405–406. doi: 10.1177/0160449X17745170
- Hartman, R. L., and Barber, E. G. (2020). Women in the workforce: The effect of gender on occupational self-efficacy, work engagement and career aspirations. *Gend. Manag. Int. J.* 35, 92–118. doi: 10.1108/GM-04-2019-0062
- Heidari, K., Amiri-Farahani, L., and Pezaro, S. (2023). The relationship between attitude and self-efficacy of labor support with supportive behaviors from the perspective of midwives. *BMC Nurs.* 22:36. doi: 10.1186/s12912-023-01197-w

- Hosen, M., Ogbeibu, S., Giridharan, B., Cham, T. H., Lim, W. M., and Paul, J. (2021). Individual motivation and social media influence on student knowledge sharing and learning performance: evidence from an emerging economy. *Comput. Educ.* 172:104262. doi: 10.1016/j.compedu.2021.104262
- Huang, S. L., and Chang, C. Y. (2020). Understanding how people select social networking services: media trait, social influences and situational factors. *Inf. Manag.* 57:103323. doi: 10.1016/j.im.2020.103323
- Huang, K., Li, M., and Markov, S. (2020). What do employees know? Evidence from a social media platform. *Account. Rev.* 95, 199–226. doi: 10.2308/accr-52519
- Huang, Y., and Zhang, J. (2020). Social media use and entrepreneurial intention: the mediating role of self-efficacy. *Soc. Behav. Personal. Int. J.* 48, 1–8. doi: 10.2224/sbp.9451
- Jackson, D., and Tomlinson, M. (2020). Investigating the relationship between career planning, proactivity and employability perceptions among higher education students in uncertain labour market conditions. *High. Educ.* 80, 435–455. doi: 10.1007/s10734-019-00490-5
- Jue, A. L., Marr, J. A., and Kassotakis, M. E. (2009). Social media at work: how networking tools propel organizational performance. San Francisco, CA, USA: John Wiley & Sons.
- Kossek, E. E., Perrigino, M., and Rock, A. G. (2021). From ideal workers to ideal work for all: a 50-year review integrating careers and work-family research with a future research agenda. *J. Vocat. Behav.* 126:103504. doi: 10.1016/j.jvb.2020.103504
- Lent, R. W., and Brown, S. D. (2020). Career decision making, fast and slow: toward an integrative model of intervention for sustainable career choice. *J. Vocat. Behav.* 120:103448. doi: 10.1016/j.jvb.2020.103448
- Ling, H., Li, J., Wang, J., and Chen, S. (2021). Research on the employment situation of Chinese college students in the prevention and control of major public health events. *Psychology* 12, 1230–1245. doi: 10.4236/psych.2021.128077
- Lowe, N. (2021). Putting skill to work: How to create good jobs in uncertain times. Cambridge, MA, USA: The MIT Press.
- Ma, P. W. W., Desai, U., George, L. S., Filippio, A. A. S., and Varon, S. (2014). Managing family conflict over career decisions: the experience of Asian Americans. *J. Career Dev.* 41, 487–506. doi: 10.1177/0894845313512898
- Ma, Y., Huang, G., and Autin, K. L. (2021). Linking decent work with academic engagement and satisfaction among first-generation college students: a psychology of working perspective. *J. Career Assess.* 29, 148–163. doi: 10.1177/1069072720943153
- McCormick, A. C., Moore, J. V., and Kuh, G. D. (2023). “Working during college: Its relationship to student engagement and education outcomes,” in Understanding the working college student. ed. L. W. Perna (Stylus), 179–212.
- Munn, S. L. (2013). Unveiling the work–life system: the influence of work–life balance on meaningful work. *Adv. Dev. Hum. Resour.* 15, 401–417. doi: 10.1177/1523422313498567
- Nadarajah, A., Ramasamy, S., Shankar, P. R., and Sreeramareddy, C. T. (2022). Development and validation of motivators for medical specialist career choice questionnaire (MMSCCQ)-a methodological study. *BMC Med. Educ.* 22:474. doi: 10.1186/s12909-022-03523-3
- Nayak, B. C., Nayak, G. K., and Jena, D. (2020). Social recognition and employee engagement: the effect of social media in organizations. *Int. J. Eng. Bus. Manag.* 12:184797902097510. doi: 10.1177/1847979020975109
- Nikitkov, A., and Sainty, B. (2014). The role of social media in influencing career success. *Int. J. Account. Inf. Manag.* 22, 273–294. doi: 10.1108/IJAIM-02-2014-0009
- Niu, Z., Willoughby, J., and Zhou, R. (2021). Associations of health literacy, social media use, and self-efficacy with health information-seeking intentions among social media users in China: cross-sectional survey. *J. Med. Internet Res.* 23:e19134. doi: 10.2196/19134
- Ostic, D., Qalati, S. A., Barbosa, B., Shah, S. M. M., Galvan Vela, E., Herzallah, A. M., et al. (2021). Effects of social media use on psychological well-being: a mediated model. *Front. Psychol.* 12:678766. doi: 10.3389/fpsyg.2021.678766
- Ozimek, P., Brailovskaia, J., and Bierhoff, H. W. (2023). Active and passive behavior in social media: validating the social media activity questionnaire (SMAQ). *Telemat. Inform. Rep.* 10:100048. doi: 10.1016/j.teler.2023.100048
- Pekkala, K., and van Zoonen, W. (2022). Work-related social media use: The mediating role of social media communication self-efficacy. *Eur. Manag. J.* 40, 67–76. doi: 10.1016/j.emj.2021.03.004
- Perna, L. W. (2023). Understanding the working college student: New research and its implications for policy and practice. London, UK: Routledge.
- Rumjaun, A., and Narod, F. (2020). “Social learning theory—albert bandura,” in *Sci. Educ. Theory Pract.* eds. B. Akpan and T. J. Kennedy (Cham: Springer), 85–99.
- Ruparel, N., Dhir, A., Tandon, A., Kaur, P., and Islam, J. U. (2020). The influence of online professional social media in human resource management: a systematic literature review. *Technol. Soc.* 63:101335. doi: 10.1016/j.techsoc.2020.101335
- Shi, Z., Huang, W., and Liang, Y. (2023). Work values (defined operationally as beliefs and priorities such as job stability, career advancement, and work-life balance) and cultural background: a comparative analysis of work values of Chinese and British engineers in the UK. *Front. Psychol.* 14:1144557. doi: 10.3389/fpsyg.2023.1144557
- Shujaat, A., Rashid, A., and Muzaffar, A. (2021). “Exploring the effects of social media use on employee performance: role of commitment and satisfaction” in Research anthology on strategies for using social media as a service and tool in business. ed. I. Management Association (IGI Global Scientific Publishing), 1788–1809.
- Sulistiobudi, R. A., and Hutabarat, H. N. (2022). Adaptation of work values instrument in Indonesian final year university students. *Front. Psychol.* 13:858688. doi: 10.3389/fpsyg.2022.858688
- Sun, Y., and Zhang, Y. (2021). A review of theories and models applied in studies of social media addiction and implications for future research. *Addict. Behav.* 114:106699. doi: 10.1016/j.addbeh.2020.106699
- Szromek, A. R., and Wolniak, R. (2020). Job satisfaction and problems among academic staff in higher education. *Sustain. For.* 12:4865. doi: 10.3390/su12124865
- Tajurrahim, N. N. S., Abu Bakar, E., Md Jusoh, Z., Ahmad, S. O., and Muhammad Arif, A. M. (2020). The effect of intensity of consumer education, self-efficacy, personality traits and social media on consumer empowerment. *Int. J. Consum. Stud.* 44, 511–520. doi: 10.1111/IJCS.12585
- Tess, P. A. (2013). The role of social media in higher education classes (real and virtual)—a literature review. *Comput. Hum. Behav.* 29, A60–A68. doi: 10.1016/j.chb.2012.12.032
- Wang, B. J., and Yang, D. T. (2014). An empirical study on the organizational identification, job embeddedness of post-80s migrant workers and their impact on job performance. *Soft Science.* 28, 106–109. doi: 10.13956/j.ss.2014.01.017
- Wang, T., and Li, S. (2022). Relationship between employment values and college students’ choice intention of slow employment: a moderated mediation model. *Front. Psychol.* 13:940556. doi: 10.3389/fpsyg.2022.940556
- Waworuntu, E. C., Kainde, S. J., and Mandagi, D. W. (2022). Work-life balance, job satisfaction and performance among millennial and gen Z employees: a systematic review. *Society* 10, 384–398. doi: 10.33019/society.v10i2.464
- Wei, J., Chen, Y., Zhang, Y., and Zhang, J. (2020). How does entrepreneurial self-efficacy influence innovation behavior? Exploring the mechanism of job satisfaction and Zhongyong thinking. *Front. Psychol.* 11:708. doi: 10.3389/fpsyg.2020.00708
- Xu, T. (2023). From academic burden reduction to quality education: a case study of students’ and parents’ perceptions and experiences under the double-reduction policy in China. Doctoral thesis, Lingnan University, Hong Kong.
- Zafar, A. U., Qiu, J., Li, Y., Wang, J., and Shahzad, M. (2021). The impact of social media celebrities’ posts and contextual interactions on impulse buying in social commerce. *Comput. Hum. Behav.* 115:106178. doi: 10.1016/j.chb.2019.106178
- Zhang, H., Gupta, S., Sun, W., and Zou, Y. (2020). How social-media-enabled co-creation between customers and the firm drives business value? The perspective of organizational learning and social capital. *Inf. Manag.* 57:103200. doi: 10.1016/j.im.2019.103200
- Zhonglin, W., and Baojuan, Y. (2014). Mediation effect analysis: methods and model development. *Adv. Psychol. Sci.* 22:731. doi: 10.3724/SPJ.1042.2014.00731



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EDITED BY

María del Mar Molero Jurado,
University of Almeria, Spain

REVIEWED BY

Isabella Poggi,
Roma Tre University, Italy
Rahmat Aziz,
Universitas Islam Negeri Maulana Malik
Ibrahim, Indonesia

*CORRESPONDENCE

Jing Jing
✉ 200207005@fynu.edu.cn

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HEXACO traits, emotional intelligence, and mental health: evidence from Chinese music education and implications for personality–stress interactions

Jing Jing*

School of Music and Dance, Fuyang Normal University, Fuyang, Anhui, China

Introduction: This study examines the intricate relationship between HEXACO personality dimensions, specifically honesty-humility (H-H), emotional intelligence, stress, and mental health, within the context of music education in China.

Methods: Utilizing the PROCESS Procedure for SPSS, developed by Andrew F. Hayes, we analyzed data from a sample of 746 music students aged 18–35 years, enrolled in undergraduate to graduate-level programs. The mediational model (Model 15) identified trait emotional intelligence as the mediator (M), with stress as the independent variable (X) and mental health as the dependent variable (Y), while considering H-H as a moderating variable (W).

Results: Our findings demonstrate that trait emotional intelligence significantly mediates the effect of stress on mental health, with the H-H dimension moderating this mediation, thereby enhancing the protective effect of emotional intelligence against stress-induced negative mental health outcomes.

Discussion: These results suggest practical applications for music education, indicating that integrating emotional intelligence training into curricula could be beneficial for improving stress management and mental health among students. Furthermore, recognizing H-H as a moderating factor highlights the importance of developing tailored support strategies to address the unique pressures faced by music students, thereby fostering a more supportive educational environment that is conducive to both academic achievement and personal growth.

KEYWORDS

HEXACO personality traits, emotional intelligence, stress management, mental health, music education

Introduction

In recent years, the relationship between personality traits, emotional intelligence, stress, and mental health has gained significant attention within psychological and educational research (Wang et al., 2024; Zhang and Hu, 2024). However, within the specialized domain of music education, where emotional and creative demands are uniquely intertwined with the educational process, these relationships remain underexplored (Chen, 2024). Despite the recognized importance of emotional intelligence in managing stress and promoting mental wellbeing, there is a lack of research specifically addressing how personality traits, particularly those in the HEXACO model, interact with these factors in the context of music education.

This study addresses this gap by focusing on the HEXACO personality dimension of honesty-humility (H-H) and its interaction with stress and mental health outcomes,

mediated by trait emotional intelligence, among music students in China. Music education, inherently rich in emotional expression, offers a distinct environment for exploring how individual differences in personality traits affect students' ability to manage stress and maintain mental health (Nwokenna et al., 2022).

While the HEXACO model has been extensively studied about various psychological outcomes, its application within the context of music education and its interaction with emotional intelligence have been limited (Li et al., 2023). Honesty-humility, a dimension encompassing sincerity, fairness, avoidance of greed, and modesty, may significantly impact how students experience stress and utilize emotional intelligence to protect their mental health in the demanding environment of music education (Pilch, 2023).

Moreover, exploring these relationships in a specific educational context, such as music training, may yield insights that are also relevant to broader psychological theory (Chen, 2023). The interplay between dispositional traits, such as H-H, and emotional functioning under stress may reflect more general mechanisms of adaptation and self-regulation. While the present study is situated within the domain of music education, the theoretical framework it engages may contribute to understanding personality–stress–health dynamics in other high-demand contexts, as Quality of Life (López-González and Topa, 2024), organizational justice (Travis et al., 2024) or working life (Mellor and Elliott, 2025).

In this sense, the current research aims not only to inform practice and support the wellbeing of music students but also to contribute to the broader literature on personality and mental health. Investigating these constructs in an emotionally intense educational environment may help reveal patterns and interactions that extend beyond the immediate sample, offering directions for future research across educational and occupational settings.

This study proposes that H-H moderates the relationship between stress and mental health, mediated by emotional intelligence, offering a novel perspective on how personality traits can influence educational and psychological outcomes. By addressing this research gap, the study aims to provide practical implications for educators and policymakers in designing targeted interventions that enhance mental wellbeing and academic success in music education.

Through this investigation, which focuses on Chinese music students in tertiary education, the research aims to contribute to the broader discourse on stress, mental health, and emotional intelligence in the educational context. The findings are expected to inform strategies that promote a supportive educational environment, ultimately aiding in the holistic development of students in the field of music education.

Literature review

Mental health and Chinese music students' stress

The psychological wellbeing of music students in China has become an increasingly critical area of concern as educational paradigms shift (Sun, 2022). While stress is inherent in rigorous academic environments, the intense demands of music education—characterized by fierce competition, extensive practice routines, and the pressures of public performances—significantly elevate stress levels among these students. Although some level of stress can

motivate students to strive for excellence, the predominantly high levels of stress observed among Chinese music students often pose serious threats to their mental health (Jääskeläinen, 2023).

However, the existing literature often focuses on the prevalence of mental health issues without thoroughly exploring the underlying causes or the complex interplay between stress and mental health in this unique context. Cultural factors further complicate this issue. In China, the cultural valorization of academic and musical success exacerbates these pressures, prompting students to pursue an unrelenting quest for perfection (Kai, 2012). This cultural backdrop, which prioritizes academic achievement over individual wellbeing, often leads to the neglect of mental health issues, either through stigma or lack of awareness (Qi, 2023).

While several studies have highlighted the detrimental impact of these stressors on mental health, revealing issues such as anxiety, depression, and other forms of psychological distress among Chinese music students (Demirbatir, 2012; Kamza and Bazarbekova, 2023; Wristen, 2013), there remains a gap in understanding the mechanisms through which stress impacts mental health. Specifically, the role of personality traits and emotional intelligence in moderating or mediating these effects has not been sufficiently explored. Addressing this gap is crucial for developing targeted interventions that can mitigate these stressors and improve mental health outcomes among music students in China.

The present study aims to address this gap by investigating the impact of stress on mental health among Chinese music students, with a focus on the potential mediating role of Trait Emotional Intelligence (TEI) and the moderating role of the H-H dimension of the HEXACO personality model. By exploring these factors, this study aims to provide a more comprehensive understanding of the factors that contribute to mental health outcomes in this population, offering insights into potential strategies for enhancing student wellbeing.

Trait emotional intelligence as a mediator between stress and mental health

Trait Emotional Intelligence (TEI) has been increasingly recognized as a critical factor in mediating the relationship between stress and mental health. TEI encompasses the ability to perceive, use, understand, and manage emotions, which can act as a buffer against the negative effects of stress. Studies have shown that students with higher levels of TEI are better equipped to manage stress and are less likely to experience negative mental health outcomes, such as anxiety and depression (Fteiha and Awwad, 2020; Zarei et al., 2019).

However, the literature presents mixed findings on the role of TEI across different educational contexts. For example, while some studies have found that higher TEI levels are associated with better adaptation and wellbeing among students, others have indicated that TEI does not significantly predict competence or academic performance, suggesting that other factors, such as adversity quotient, might play a more crucial role (Widodo et al., 2022). This discrepancy underscores the need for further research to elucidate the conditions under which TEI functions as an effective mediator in the stress-mental health relationship.

In the context of university students, several studies have confirmed the mediating role of TEI between stress and mental health, suggesting that interventions aimed at enhancing TEI could be beneficial in reducing stress and improving mental health outcomes (Ewaiwi et al., 2024). These

findings underscore the importance of integrating TEI training into educational curricula to better equip students with the emotional skills necessary to manage stress and maintain mental wellbeing. However, the specific dynamics of how TEI interacts with personality traits, such as H-H, in this mediation process remain underexplored, particularly in the context of music education.

Honesty-humility as a moderator in the stress-mental health relationship

Personality traits, particularly those within the HEXACO model, are often considered foundational factors that influence how individuals cope with stress. The H-H dimension, in particular, is characterized by traits such as sincerity, fairness, greed avoidance, and modesty, which may play a crucial role in moderating the impact of stress on mental health. Individuals high in H-H are generally sincere, fair, and modest, while those low in this trait are more likely to exhibit manipulateness, deceit, and pretentiousness.

While direct evidence on the moderating role of H-H in the stress-mental health relationship is limited, related research suggests its potential significance. For instance, studies have shown that personality traits promoting positive self-regard and kindness, such as those encompassed by H-H, can buffer the negative impacts of stress (Zhang et al., 2016). Furthermore, the emphasis on fairness and sincerity within the H-H dimension could influence how individuals perceive and respond to stress, potentially leading to more adaptive coping strategies and better mental health outcomes.

The literature on emotional intelligence and coping styles further supports the potential moderating role of H-H. For example, Sun and Lyu (2022) highlighted the importance of emotional and interpersonal skills in managing stress, suggesting that individuals high in H-H may be more effective in leveraging these skills. Although there is a need for direct empirical studies to explore H-H's moderating role in the stress-mental health relationship, the existing literature on personality traits and stress management provides a strong theoretical foundation for this line of inquiry.

Honesty-humility and trait emotional intelligence: a moderated mediation model

Building on the previous sections, the current study proposes that H-H not only moderates the direct relationship between stress and mental health but also moderates the indirect relationship mediated by TEI. This moderated mediation model suggests that individuals with high levels of H-H may utilize their TEI more effectively in managing stress, leading to better mental health outcomes.

Empirical studies have demonstrated that TEI can influence coping styles and mental health outcomes, with higher TEI levels being linked to a preference for problem-oriented coping strategies and better mental health (Molero-Jurado et al., 2021). However, the role of H-H in this process remains underexplored. It is hypothesized that H-H, by promoting sincerity, fairness, and modesty, could enhance the effectiveness of TEI in stress management, thus further protecting against negative mental health outcomes.

For instance, in educational settings, students with high TEI who also score high on H-H might be better equipped to manage stress through empathetic understanding and emotional regulation,

fostering resilience and positive mental health. This hypothesis aligns with findings that higher TEI levels correlate with lower stress levels, particularly in demanding academic environments such as medical schools (Fiorilli et al., 2020).

The present study aims to empirically test this moderated mediation model, offering new insights into the intricate relationship between personality traits, emotional intelligence, stress, and mental health. While the research is grounded in the context of Chinese music education, where students often face high emotional demands and performance pressure, the proposed model engages theoretical constructs that may hold relevance beyond this specific population. By investigating how H-H moderates the stress-mental health relationship through emotional intelligence, this study aims not only to inform targeted interventions in music education but also to contribute to a broader understanding of personality-emotion dynamics in psychologically demanding environments.

Hypotheses

H1: Students' stress will predict students' mental health.

H2: Trait Emotional intelligence will mediate between Students' Stress and Mental Health.

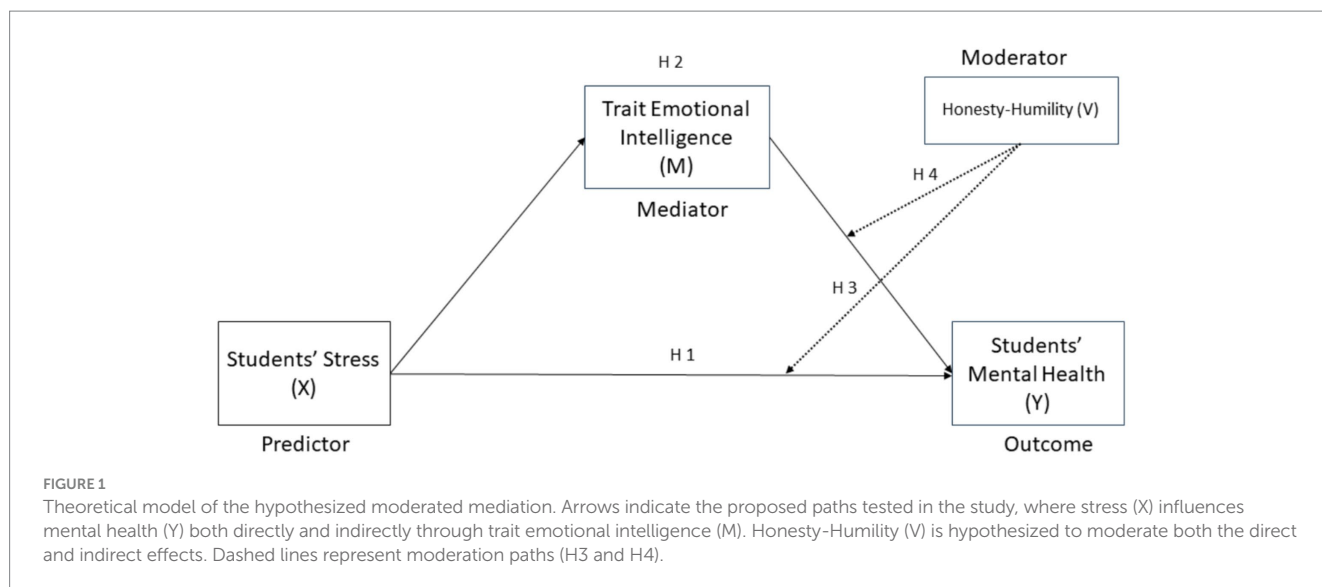
H3: H-H will moderate the direct relationship between Students' Stress and Mental Health.

H4: H-H will moderate the indirect relationship between Students' Stress and Mental Health mediated by Emotional intelligence. The complete model of hypotheses is displayed in Figure 1.

Method

Participants

This investigation focused on a group of Chinese Music students, totaling 746 individuals, ranging in age from 18 to 35 years (average age = 26.98 years; standard deviation = 4.76), of whom 59.9% were female. These students were enrolled in Tertiary Education, both at undergraduate and graduate levels, in conservatories, Universities, and Colleges with a department or School of music. The majority were pursuing a Bachelor of Music (50.1%), while others were pursuing a Master of Music (25.2%). Additionally, some were enrolled in doctoral programs, including the Doctor of Musical Arts (DMA) and the Ph.D. in Music (24.4%). The fields of specialization were performance, music education, composition, musicology, music technology, and conducting. Regarding their professional activities, the majority of the participants (79.1%) were only studying, while 19.4% developed a part-time professional activity, and the rest were searching for a professional activity. The participants for this study were selected through a convenience sampling method, which involved recruiting students from various conservatories, universities, and colleges with music departments in China. While this approach enabled the efficient collection of data from a specific population, it may introduce certain biases, particularly related to the sample's representativeness. For instance, students who are more engaged or have a stronger connection to their institutions might have been more likely to participate, potentially leading to an overrepresentation



of highly motivated individuals. Additionally, the sample's gender distribution, with a higher percentage of female participants, might influence the generalizability of the findings. The diversity in fields of specialization and educational levels adds depth to the sample, but it also introduces variability that could affect the consistency of the results. Future research should consider employing random sampling methods and including a broader demographic range to mitigate these biases and enhance the robustness of the findings.

Procedure

The recruitment of participants was achieved through postings on bulletin boards and the universities' and conservatories' online networks. As a Music student, the author actively disseminated the information through social networks. These postings succinctly outlined the primary objective of the research and highlighted that involvement was entirely voluntary, with the option for participants to opt out at any time without repercussions, and clarified that there would be no monetary reward for participation. Contact information for the lead researcher was made available through a WeChat number for potential participants to make further inquiries. The Institutional Review Board of Fu Yang Normal University approved the design before its implementation. Those who reached out via this contact method were provided with comprehensive instructions on how to complete the survey. The survey began with three questions to confirm informed consent, and only those who affirmed their consent were permitted to proceed to the subsequent portion, which included completing various survey scales. Originally, the sample size at the outset was 789 individuals; however, 43 individuals were excluded from the analysis because they did not complete the survey in its entirety.

Instruments

Students' stress

The Perceived Stress Scale (PSS) is a self-reported 10-item scale. The 10-item version (PSS-10) has demonstrated good reliability and validity, with Cronbach's α ranging from 0.78 to 0.91 and test-retest reliability

coefficients of 0.55 to 0.80 (Cohen et al., 1983). The SCPSS-10, the Chinese version of the PSS-10 (Lu et al., 2017), has shown good reliability and validity with a Cronbach's α of 0.86 (Leung et al., 2010). Participants rated how often they experienced each item over the past month on a 5-point Likert scale, ranging from 1 (never) to 5 (very often). The higher scores indicate greater levels of perceived stress. Examples of items are: "In the last month, how often have you been upset because of something that happened unexpectedly?" and "In the last month, how often have you been unable to control the important things in your life?"

Trait emotional intelligence

The Short-Form Trait Emotional Intelligence Questionnaire (TEIQue-SF) consists of 30 items, serving as a condensed version of the comprehensive Trait Emotional Intelligence Questionnaire (Petrides and Furnham, 2000). This instrument is designed to evaluate individuals' self-assessed emotional abilities and their capacity to manage and perceive emotions adaptively. Illustrative items from the questionnaire are "I'm usually able to influence the way other people feel" and "I often pause and think about my feelings," which participants respond to using a seven-point Likert scale. The aggregation of these item responses yields an overall score representing the respondent's trait of emotional intelligence (Cooper and Petrides, 2010).

Honesty-humility

The HEXACO-60, introduced by Ashton and Lee (2009), represents a concise iteration of the HEXACO personality inventory, comprising 60 items. This abridged version encompasses six domains—honesty-humility, emotionality, extraversion, agreeableness, conscientiousness, and openness to experience—with each domain featuring ten items subdivided into four distinct facets. Responses to these items are measured using a five-point Likert scale. The H-H dimension includes subdimensions. The Sincerity scale evaluates individuals' inclination towards authenticity in social interactions, distinguishing those who may use flattery for personal gain from those who prefer honesty and are resistant to manipulating others.

The Fairness scale measures one's propensity to eschew dishonesty and unethical behavior. Individuals scoring low may

resort to deceit or theft for personal benefit, while those scoring high demonstrate a commitment to ethical principles, refraining from exploiting others or society. The Greed Avoidance Scale gauges the level of disinterest in acquiring opulent wealth or symbols of high status. It contrasts those who seek and flaunt affluence with those who are indifferent to wealth and societal status as primary motivators. Lastly, the Modesty scale determines the degree to which individuals are humble and unpretentious. Those with low scores may perceive themselves as superior and deserving of special rights, whereas high scorers regard themselves as equal to others, without entitlement to privileged treatment. The stability of the structure and its psychometric properties have been tested for 18 countries, including China, with adequate findings (García et al., 2022). The Chinese simplified version of the scale is available at <https://hexaco.org/hexaco-inventory>. Examples of items are: “If I want something from someone, I will laugh at their jokes, even if they are not funny,” and “I would not try to please someone just to get their favors.”

Mental health

The Positive Mental Health Scale (PMH-scale), as introduced by Lukat et al. (2016), is a nine-item instrument designed to measure the emotional dimensions of wellbeing, albeit without direct reference to established theories of wellbeing. This scale was designed to capture a unified dimension of positive emotional states indicative of good mental health. Individuals participating in the assessment are asked to evaluate statements such as “I am in good physical and emotional condition” or “I am often carefree and in good spirits” using a four-point scale, where 0 signifies strong disagreement and 3 signifies strong agreement. The scale is noted for its robust psychometric characteristics. In studies involving various demographics, including students and distinct patient cohorts, the PMH scale consistently demonstrated a single-factor structure, emphasizing its efficacy in gauging positive mental health (Bieda et al., 2017). The Chinese adaptation of the scale was used (Wu et al., 2020).

The selection of these instruments was guided by their established reliability, validity, and relevance to the constructs being measured in this study. The Perceived Stress Scale (PSS-10) was selected due to its widespread use and robust psychometric properties, particularly its adaptability to diverse cultural contexts, as demonstrated by its validated Chinese version. This ensures that the measurement of stress levels among Chinese music students is both reliable and culturally appropriate. The Short-Form Trait Emotional Intelligence Questionnaire (TEIQue-SF) was selected for its efficiency in capturing key aspects of emotional intelligence, which is central to understanding the mediating role of emotional intelligence in the relationship between stress and mental health (Al-Dassean, 2023). The HEXACO-60 was chosen to measure H-H due to its comprehensive and empirically validated framework for assessing personality traits, including its tested reliability across various cultures (Abbasi et al., 2025), including China. Finally, the Positive Mental Health Scale (PMH-scale) was selected for its focus on the positive dimensions of mental health, which aligns with the study’s aim to assess not just the absence of distress but the presence of wellbeing. These instruments collectively provide a thorough and culturally sensitive assessment of the key variables

under investigation, ensuring that the study’s findings are both robust and meaningful.

Data analyses

Descriptive and correlational analyses were conducted with SPSS version 29. In examining the relationships between students’ stress, trait emotional intelligence, and mental health, with an additional consideration of the moderating role of H-H, a sophisticated mediational model was employed. Utilizing the PROCESS Procedure for SPSS (Hayes, 2013), developed by Andrew F. Hayes, the analysis was conducted on a sample size of 746. The mediational model (Model 4) identified trait emotional intelligence as the mediator (M), with stress as the independent variable (X) and mental health as the dependent variable (Y). In a second step, Model 15 was used, considering H-H as a moderating variable (W), both on the direct (stress-mental health) and the indirect relationships (stress-trait emotional intelligence-mental health). The variables that define products were mean-centered before the analyses. The statistical Diagram is displayed in Figure 2. The top panel illustrates Model 4 (simple mediation), where trait emotional intelligence (M) serves as a mediator of the relationship between stress (X) and mental health (Y). The bottom panel illustrates Model 15 (moderated mediation), in which H-H (V) moderates both the direct ($X \rightarrow Y$) and indirect ($M \rightarrow Y$) pathways. Standardized path coefficients and significance levels are reported along each path.

Results

Descriptive statistics and Pearson’s correlations

As Table 1 showed, correlation analysis underscored a significant negative association between stress and both trait emotional intelligence and mental health, indicating that individuals with higher emotional intelligence tend to report lower stress levels and better mental health. Furthermore, a notable positive relationship emerged between trait emotional intelligence and mental health, indicating that emotional intelligence plays a key role in promoting psychological wellbeing. While the correlation between stress and H-H was weaker, it nonetheless suggested a pattern in which higher levels of H-H are associated with lower stress levels. Similarly, a positive correlation was observed between H-H and mental health, although it was less pronounced in magnitude. These findings illuminate the intricate web of relationships among personality traits, emotional intelligence, and psychological outcomes, highlighting the pivotal role of emotional intelligence in managing stress and promoting mental health.

Hypothesis 1: students’ stress will predict students’ mental health

To test Hypothesis 1, which posited that students’ stress would significantly predict their mental health, a regression analysis was conducted. The results indicated that students’ stress was a significant predictor of their mental health, as shown in Table 2 (Model $R^2 = 0.376$;

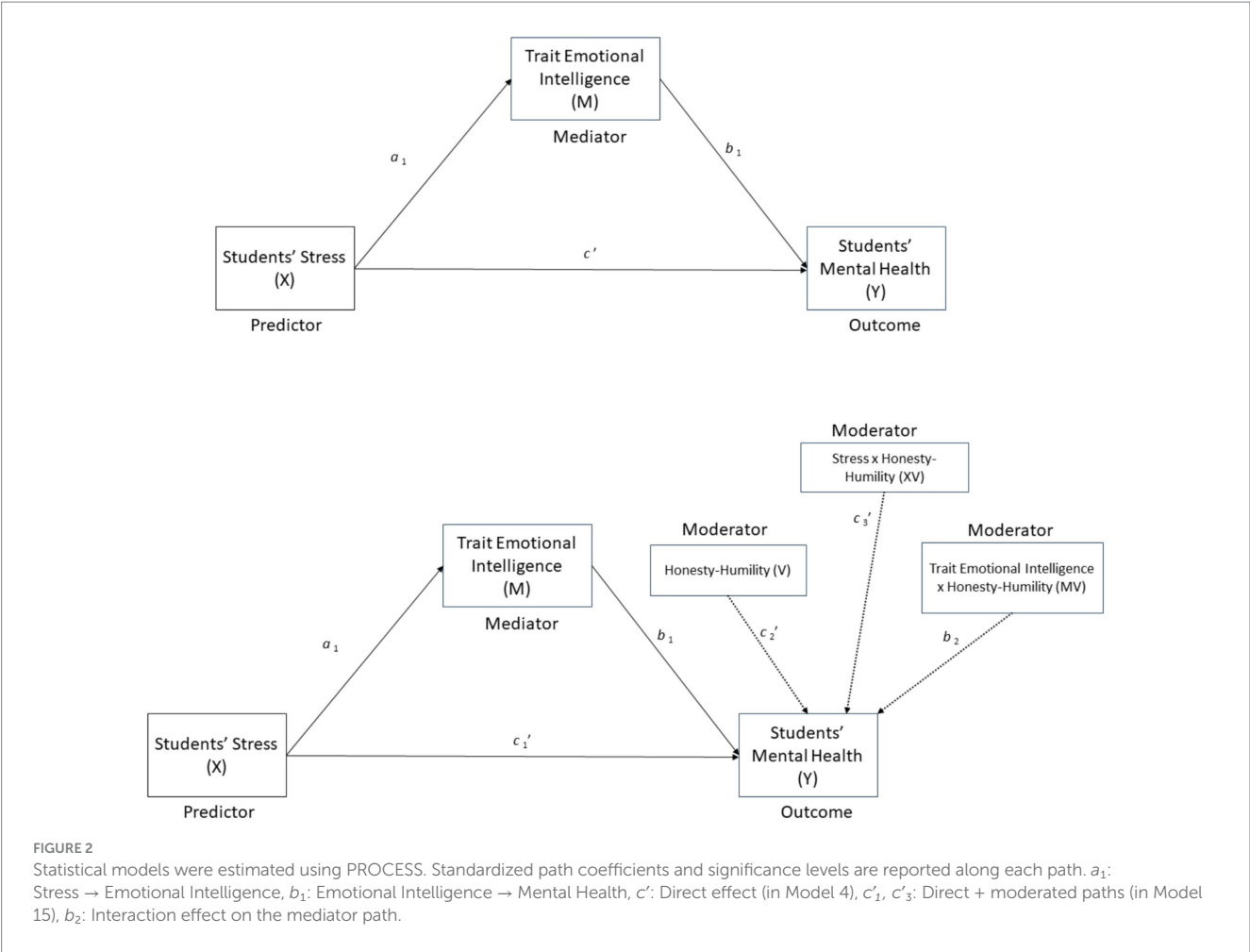


TABLE 1 Descriptive statistics and Pearson's correlation matrix ($N = 746$).

Variables	Mean	S.D.	Stress	Trait emotional intelligence	Honesty-humility	Mental health
Stress	2.59	0.756	<i>0.77</i>			
Trait emotional intelligence	5.00	0.731	-0.614^{**}	<i>0.84</i>		
Honesty-humility	5.01	1.06	-0.192^{**}	0.225^{**}	<i>0.79</i>	
Mental Health	5.38	0.994	-0.619^{**}	0.811^{**}	0.131^{**}	<i>0.80</i>

* $p < 0.05$; *** $p < 0.001$. Values in italics in the diagonal are Cronbach's alphas.

$F(1, 744) = 449.84$; $p < 0.001$). This suggests that higher levels of stress are associated with poorer mental health outcomes among students.

Hypothesis 2: trait emotional intelligence will mediate the relationship between students' stress and mental health

Hypothesis 2 proposed that trait emotional intelligence would mediate the relationship between students' stress and their mental health. A mediation analysis was performed using the PROCESS macro (Model 4) to examine this hypothesis.

The analysis revealed that students' stress levels were a significant predictor of trait emotional intelligence, indicating that higher levels

of stress were associated with lower levels of trait emotional intelligence. Additionally, trait emotional intelligence was a significant predictor of students' mental health ($R^2 = 0.682$; $F(2, 743) = 796.72$; $p < 0.001$). The direct effect of students' stress on their mental health, when controlling for trait emotional intelligence, remained significant but was reduced, as shown in Table 3.

The indirect effect of students' stress on their mental health through trait emotional intelligence was also significant, with a 95% confidence interval that did not include zero (-0.4716 , -0.3804), suggesting partial mediation. Overall, the results support both Hypothesis 1 and Hypothesis 2. Students' stress negatively impacts their mental health, and this relationship is partially mediated by trait emotional intelligence. This suggests that while stress directly impacts mental health, a portion of its

TABLE 2 Regression analysis for the mediation model.

Outcome variable	Predictor	<i>B</i>	SE	<i>t</i>	<i>p</i>	95% CI	β
Trait emotional intelligence (M)	Students' stress (X)	−0.59	0.03	−21.21	<0.001	[−0.65, −0.54]	−0.61
Students' mental health (Y)	Students' stress (X)	−0.26	0.03	−7.42	<0.001	[−0.32, −0.19]	−0.19
	Trait emotional intelligence (M)	0.94	0.04	26.41	<0.001	[0.87, 1.01]	0.69

TABLE 3 Total, direct, and indirect effects of students' stress on students' mental health.

Effect type	Effect	SE	<i>t</i>	<i>p</i>	95% CI	β
Total effect (X → Y)	−0.81	0.04	−21.51	<0.001	[−0.89, −0.74]	−0.62
Direct effect (X → Y)	−0.26	0.03	−7.42	<0.001	[−0.32, −0.19]	−0.19
Indirect effect (X → M → Y)	−0.56	0.04			[−0.64, −0.49]	−0.42

N = 746. X = Students' stress, M = Trait Emotional Intelligence, Y = Students' Mental Health. Bootstrap samples = 5000.

TABLE 4 Moderated mediation analysis for the direct relationship between students' stress and mental health.

Outcome variable	Predictor	<i>B</i>	SE	<i>t</i>	<i>p</i>	95% CI	β
Trait emotional intelligence (M)	Students' stress (X)	−0.59	0.03	−21.21	<0.001	[−0.65, −0.54]	−0.61
Students' mental health (Y)	Students' stress (X)	−0.27	0.03	−7.74	<0.001	[−0.33, −0.20]	−0.27
	Trait emotional intelligence (M)	0.95	0.04	26.64	<0.001	[0.88, 1.02]	0.69
	Humility (W)	−0.06	0.02	−3.05	0.002	[−0.10, −0.02]	−0.06
	Interaction (Stress × Humility)	−0.04	0.03	−1.46	0.145	[−0.10, 0.02]	−0.04
	Interaction (Emotional Intelligence × Humility)	−0.08	0.03	−2.49	0.013	[−0.14, −0.02]	−0.08

effect operates indirectly through its influence on trait emotional intelligence.

Hypothesis 3: humility will moderate the direct relationship between students' stress and mental health

To test Hypothesis 3, which proposed that humility would moderate the direct relationship between students' stress and mental health, a moderated mediation analysis was conducted using the PROCESS macro (Model 15). The results indicated that the interaction between students' stress and humility did not significantly predict mental health, as shown in Table 4.

The direct and indirect path coefficients are displayed in Figure 3.

However, the direct effect of students' stress on their mental health was significant across all levels of humility, as shown in Table 5. These results suggest that while humility did not significantly moderate the direct relationship, the negative impact

of stress on mental health was more pronounced at higher levels of humility, as shown in Figure 4.

Hypothesis 4: humility will moderate the indirect relationship between students' stress and mental health mediated by emotional intelligence

Hypothesis 4 posited that humility would moderate the indirect relationship between students' stress and mental health through emotional intelligence. The Model displays adequate values, as indicated by Model $R^2 = 0.689$, $F(5, 740) = 327.36$, $p < 0.001$. The results indicated a significant interaction between emotional intelligence and humility in predicting mental health, as shown in Table 6. This finding supports the hypothesis that humility moderates the indirect relationship.

The index of moderated mediation was significant (see Table 6), indicating that the mediation of emotional intelligence is moderated by humility.

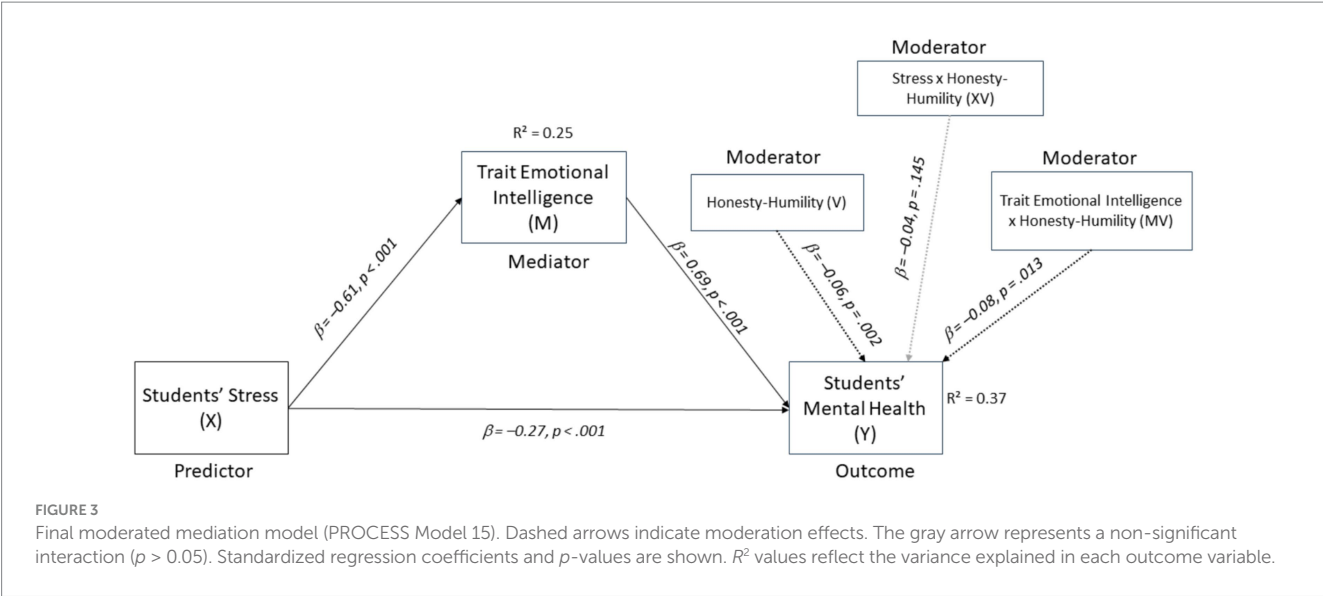
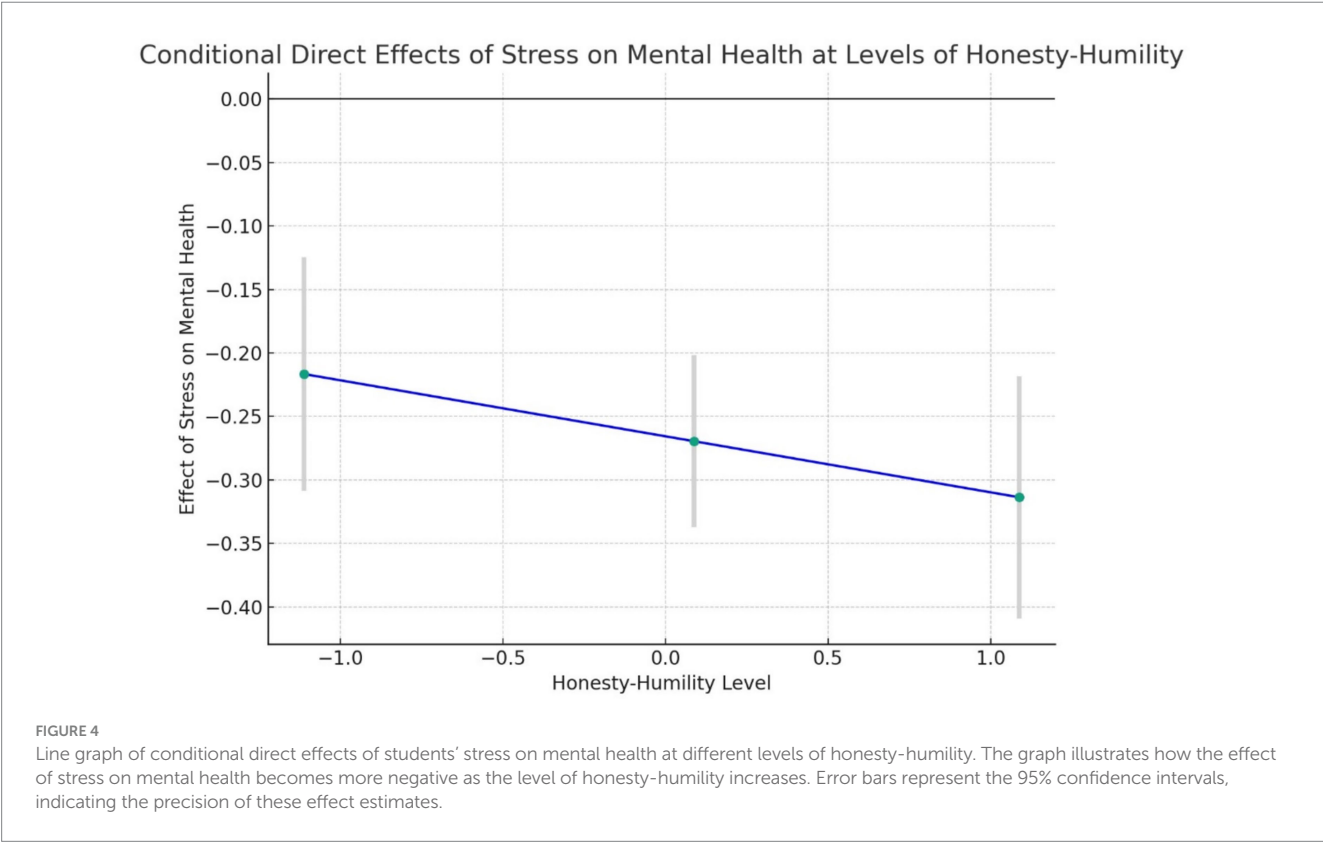


TABLE 5 Conditional direct effects of students' stress on mental health at different levels of humility.

Humility level	Effect	SE	<i>t</i>	<i>p</i>	95% CI	β
Low (−1.1121)	−0.22	0.05	−4.62	<0.001	[−0.31, −0.12]	−0.22
Average (0.0879)	−0.27	0.03	−7.81	<0.001	[−0.34, −0.20]	−0.27
High (1.0879)	−0.31	0.05	−6.46	<0.001	[−0.41, −0.22]	−0.31



The conditional indirect effects of students' stress on mental health through emotional intelligence were significant at all levels of humility. Specifically, at low levels of humility, the indirect effect was

$\beta = -0.6173$; at average levels of humility, the indirect effect was $\beta = -0.5609$; and at high levels of humility, the indirect effect was $\beta = -0.5139$, as shown in Table 7. The results are depicted in Figure 5.

TABLE 6 Index of Moderated Mediation.

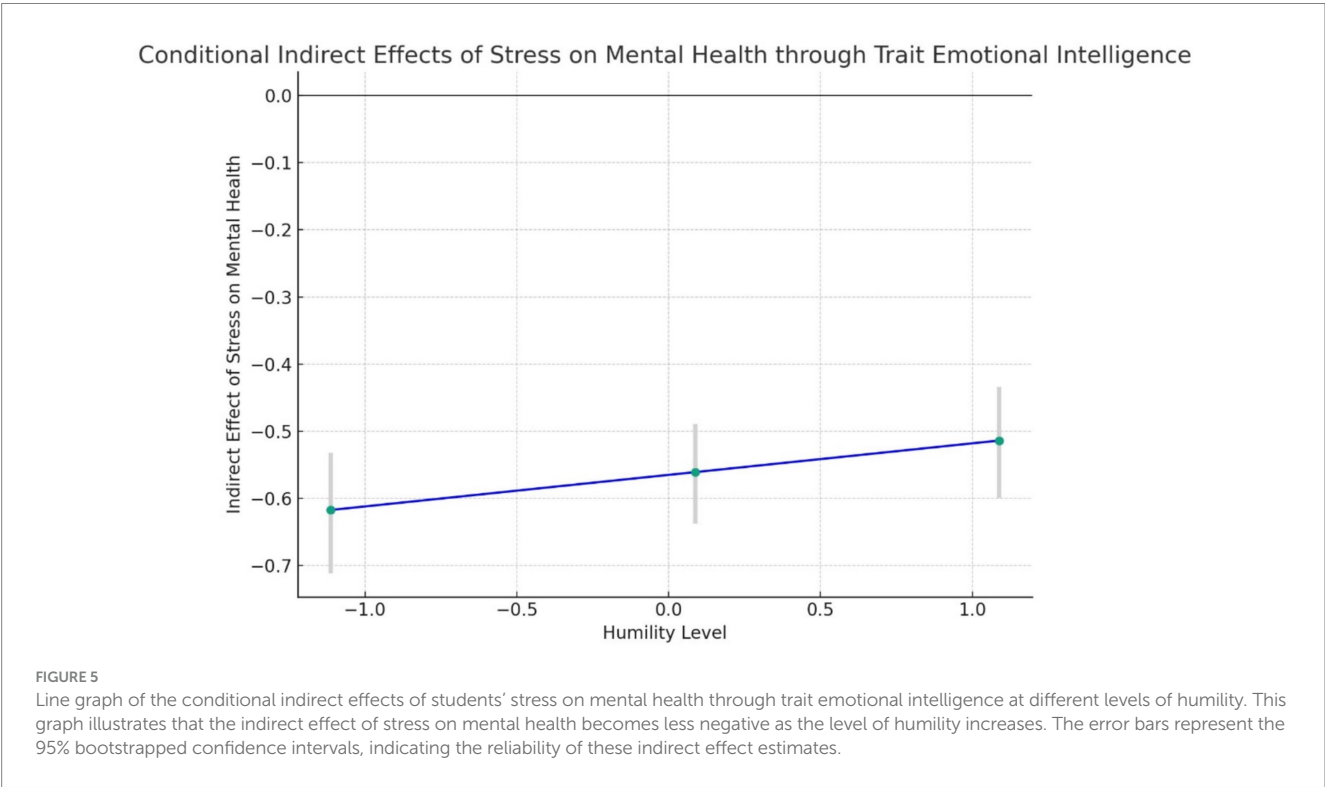
Predictor	Index	BootSE	BootLLCI	BootULCI
Humility	0.0470	0.0200	0.0098	0.0878

BootSE = bootstrap standard error; BootLLCI = bootstrap lower-level confidence interval; BootULCI = bootstrap upper-level confidence interval. The indirect effects and index of moderated mediation indicate the role of humility in the indirect path from X to Y via the mediating variable (students' stress on Mental Health through Trait Emotional Intelligence).

TABLE 7 Conditional indirect effects of students' stress on mental health through trait emotional intelligence at different levels of humility.

Humility level	Indirect effect	BootSE	BootLLCI	BootULCI
Low (16th percentile)	−0.6173	0.0455	−0.7113	−0.5322
Average (50th percentile)	−0.5609	0.0378	−0.6372	−0.4888
High (84th percentile)	−0.5139	0.0421	−0.5991	−0.4341

N = 746. Indirect effect values are derived from bootstrap estimates with 5,000 samples. BootLLCI = Bootstrapped lower limit confidence interval; BootULCI = Bootstrapped upper limit confidence interval.



The moderation analyses provided insightful findings into the complex dynamics between stress, emotional intelligence, and mental health, as well as how the level of H-H influences these dynamics.

Discussion

The present study aimed to examine the relationships among stress, mental health, and the HEXACO personality traits within the context of music education in China. Based on the present results, the mediational analysis provided substantial insights. Central to the findings was the direct negative influence of stress on mental health. The analyses revealed that trait emotional intelligence significantly mediated the relationship between stress and mental health across all examined levels of H-H (low, medium, and high). This pattern highlights a consistent indirect effect, indicating that increased stress levels have a detrimental impact on mental health, with this effect being mediated by the individual's level of trait emotional intelligence,

regardless of their H-H. This finding lends weight to the argument that emotional intelligence traits are pivotal in navigating the adverse effects of stress on mental health.

An individual with a relatively high level of emotional intelligence exhibits behaviors and characteristics that enable effective management of stress and its associated mental health challenges, particularly within the demanding context of music education. Such individuals are likely to possess a heightened ability to perceive and understand their own emotions, as well as those of others, which allows them to respond to stressors in a more adaptive and controlled manner. For example, they may utilize problem-focused coping strategies, such as breaking down tasks into manageable steps, or they might engage in emotion-focused coping, like reappraising stressful situations in a more positive light. Additionally, these individuals are better equipped to regulate their emotional responses, preventing stress from escalating into more severe mental health issues. This self-regulation not only helps them maintain emotional stability under pressure but also enables them to sustain their mental wellbeing over

time. The mediation effect observed in this study highlights the importance of these emotional intelligence traits in mitigating the negative impact of stress, suggesting that interventions aimed at enhancing emotional intelligence could be particularly beneficial in supporting the mental health of students in high-stress educational environments, such as music education (Sacchetti and Salustri, 2023).

In line with these findings, and supporting the notion that emotional intelligence plays a crucial role in mediating stress and mental health, Wang and Zeb (2022) researched into the application of music education to improve college students' mental health. Their research highlights the importance of musical emotions about individuals' characteristics and cognitive processes, suggesting a beneficial impact of music education on mental wellbeing through enhanced emotional intelligence. In contrast, Liu et al. (2023) present findings that highlight the role of music training in enhancing personality traits, including extroversion, openness, agreeableness, and conscientiousness, which, in turn, impact psychological health. Their work suggests that while emotional intelligence is crucial, the broader spectrum of personality adjustments achieved through music training also significantly contributes to mental health outcomes.

In a related vein, Qi (2023) study on the impact of music therapy on university graduates facing psychological stress reinforces the importance of music as a therapeutic tool for regulating emotional and mental health. It aligns with the proposed model by providing empirical evidence on the effectiveness of music in managing psychological stress, thereby indirectly supporting the mediating role of emotional intelligence. On a different note, Leung and Cheung (2020) focus on the mediating processes between music engagement and wellbeing in Chinese adolescents. Their research highlights the mediation of emotional awareness and emotions between music training, listening, and adolescents' wellbeing, suggesting a slightly different pathway through which music education influences mental health beyond the sole mediation of emotional intelligence.

Further complexity was unveiled through the moderated mediation analysis, which was marked by a significant index of moderated mediation. This outcome suggests that the mediational role of trait emotional intelligence in the stress-mental health nexus is not uniform but varies according to the level of H-H. Specifically, the conditional direct effects of stress on mental health also demonstrated significant variation across different levels of H-H. This variance highlights the complex interplay between stress, emotional intelligence, and personality traits in influencing mental health outcomes. These findings underscore the crucial importance of incorporating individual differences in emotional intelligence and personality traits into strategies designed to mitigate the adverse effects of stress on mental health, particularly within the demanding contexts faced by students in music education.

The moderation analyses within the study were designed to elucidate the roles of H-H in the interplay between student stress levels and mental health outcomes. Specifically, they are aimed to assess H-H's influence on both the direct relationship between stress and mental health and the indirect relationship mediated by trait emotional intelligence.

Examining the conditional direct effects of stress on mental health across varying H-H levels revealed a nuanced pattern. As H-H increased, the adverse impact of stress on mental health became more pronounced. This trend indicates that individuals with higher levels of H-H may be more susceptible to the negative effects of stress on

mental health, thereby affirming the hypothesis (H3) regarding H-H's moderating role in this direct relationship.

Individuals with higher levels of H-H may be more susceptible to the negative effects of stress on mental health due to the inherent characteristics associated with this personality trait. Those high in H-H tend to exhibit behaviors such as sincerity, modesty, and a strong aversion to greed and dishonesty, which, while generally positive, may also make them more vulnerable in high-stress environments, such as music education. Their tendency toward fairness and modesty may lead to internalizing stress and avoiding assertive behaviors that could mitigate stress, such as seeking support or advocating for themselves. Furthermore, high H-H individuals might be less likely to engage in self-promoting or competitive behaviors that could help them manage the high demands of music education more effectively. This propensity for self-sacrifice and fairness, while ethically commendable, may limit their ability to cope with stress proactively, making them more susceptible to its negative impacts on mental health (Amponsah et al., 2024). The significant moderation effect observed in this study suggests that, while these individuals may possess a high moral character, their approach to stress management may lack the assertiveness and self-protective strategies necessary to buffer against the detrimental effects of stress, thereby exacerbating the impact of stress on their mental health outcomes.

These findings, while situated within the specific context of Chinese music education, point to broader psychological mechanisms that may generalize beyond this population. The interaction between H-H and emotional intelligence in shaping responses to stress underscores the importance of integrating ethical dispositions into models of emotional functioning. In particular, the diminished protective role of emotional intelligence at higher levels of H-H invites further inquiry into how self-regulatory and moral traits jointly influence psychological adaptation under pressure. Such an interaction has implications for understanding not only stress coping in education but also broader personality dynamics in socially demanding or ethically constrained environments.

Supporting the findings on the significant role of emotional intelligence in mediating stress and mental health outcomes, Kevereski et al. (2016) discovered that individuals with low emotional intelligence exhibit lower self-confidence and higher levels of depression and aggressiveness under stressful conditions. This underscores the crucial role of emotional intelligence in navigating the complexities of stress and mental health relationships, as observed in its mediating influence.

In contrast, Schutte et al. (2002) investigated whether emotional intelligence could moderate the relationship between stress and mental health outcomes. Their focus on emotional intelligence as a potential moderator echoes the importance of emotional intelligence in stress-related contexts. Still, it does not directly address the moderating impact of H-H, highlighting a gap in literature directly related to the study's emphasis on H-H's moderation. In a related vein, Jimenez Ballester et al. (2022) found happiness to be a relevant mediator between emotional intelligence and emotional symptoms in emerging adults, indicating the complexity of emotional processes and their significant impact on mental health. Although this does not directly affirm or refute the moderation analysis findings, it adds depth to the discourse on the mediating roles of emotional intelligence.

Turning the attention to the moderation of the indirect relationship by H-H, we focused on examining how H-H affects the

mediation effect of trait emotional intelligence in the stress-mental health nexus. The index of moderated mediation provided clear evidence that H-H significantly moderates this indirect relationship. The conditional indirect effects of stress on mental health, as mediated through emotional intelligence, varied distinctly across different H-H levels. Notably, the mediation effect of emotional intelligence was found to be stronger at lower levels of H-H, with a gradual weakening observed as H-H increased. This pattern suggests that the protective role of emotional intelligence in buffering against the deleterious impact of stress on mental health is more potent among individuals with lower levels of H-H, lending support to the fourth hypothesis (H4).

The finding that the protective role of emotional intelligence (EI) in buffering against the deleterious impact of stress on mental health is more potent among individuals with lower levels of H-H offers intriguing insights into the interaction between these two traits. Individuals with lower levels of H-H may be more self-focused, assertive, and possibly more willing to engage in behaviors that prioritize their wellbeing, which could include utilizing their emotional intelligence to manage stress effectively. These individuals might be more inclined to use their emotional intelligence strategically, leveraging their ability to perceive, manage, and utilize emotions to navigate stressful situations in a way that minimizes the impact on their mental health. This strategic use of EI might be less constrained by the ethical and self-sacrificing tendencies that characterize those with higher H-H, allowing for more flexible and self-serving coping mechanisms.

Indeed, individuals with low H-H but high EI could be described as emotionally astute yet more opportunistic or pragmatic in their approach to stress management. They may possess the emotional skills to manipulate or control emotional situations to their advantage, using their EI to reduce stress while maintaining or enhancing their mental health. This combination of traits suggests a person who is not only aware of their own emotions and those of others but also willing to use this awareness in ways that are less bound by the ethical considerations typically associated with higher levels of H-H. This interpretation highlights the complex interplay between personality traits and emotional intelligence, suggesting that the effectiveness of EI as a protective factor against stress may be amplified in individuals who are less constrained by the moral and self-effacing characteristics associated with high H-H.

Regarding the specific role of H-H, a study by [Lee and Seo \(2018\)](#) on the effect of emotional intelligence on ego-resilience and self-efficacy touches on the broader implications of personality traits in emotional regulation and stress response. While not directly focused on H-H's moderation effects, it underscores the relevance of examining personality dimensions in psychological research.

The findings from the moderation analyses illuminate the dynamics at play between stress, emotional intelligence, and mental health, further elucidated by the moderating influence of H-H. These results underscore the crucial importance of recognizing individual differences in personality traits, such as H-H, for a comprehensive understanding and effective intervention in the psychological effects of stress. The research suggests that mental health improvement strategies, particularly in stress-laden contexts, could achieve greater efficacy by tailoring approaches to cater to individuals' specific levels of H-H and emotional intelligence.

In conclusion, the study makes a significant contribution to both the applied and theoretical domains by highlighting how individual differences in personality traits and emotional competencies jointly influence mental health outcomes under stress. While the primary aim was to inform mental health strategies for music students, the findings extend the current understanding of the complex roles played by H-H and emotional intelligence in psychological resilience. Future research should investigate these dynamics in other high-demand populations to assess the model's generalizability and refine intervention strategies that are sensitive to personality-based differences in stress vulnerability and emotional regulation.

Limitations and suggestions for future research

This study, which provides insightful findings on the relationships between stress, trait emotional intelligence, mental health, and the moderating role of H-H among Chinese music students, is not without limitations. Firstly, the sample is relatively homogeneous, consisting exclusively of music students from tertiary education institutions in China. This specificity may limit the generalizability of the findings to other populations, including non-music students, students in other disciplines, or individuals outside the academic context. Future research could benefit from examining these relationships in a broader demographic to enhance the generalizability of the findings.

Secondly, the study's reliance on self-reported measures introduces the potential for response biases, such as social desirability bias or inaccuracies in self-assessment. Although instruments like the PSS-10, TEIQue-SF, HEXACO-60, and PMH-scale have demonstrated good reliability and validity, the inherent nature of self-report data can affect the objectivity of the results. Incorporating objective measures or third-party assessments could provide a more nuanced understanding of the constructs being examined.

The cross-sectional design of the study is another limitation, as it does not allow for the determination of causality between stress, trait emotional intelligence, mental health, and H-H. Longitudinal or experimental designs would be beneficial in establishing causal relationships and understanding the temporal dynamics of these variables.

In addition, although the study was conducted within the specific and meaningful context of music education, some of the emerging findings—particularly those related to the interaction between H-H and emotional intelligence—suggest broader theoretical implications. The unexpected pattern wherein the protective role of emotional intelligence appears stronger at lower levels of H-H raises questions about the functional and adaptive interplay between moral character and emotional regulation. Future studies should investigate whether this moderation pattern holds in other high-stress domains, such as healthcare, law enforcement, or competitive business environments, where similar personality dynamics may be at play.

Additionally, the exclusion of 43 individuals from the analysis due to incomplete survey responses may have introduced bias, potentially affecting the representativeness of the sample. This attrition could influence the study's outcomes and interpretations, and future research may aim to minimize dropouts or account for their potential impact on the findings.

Furthermore, the study did not explore the specific subdimensions of H-H in depth, such as sincerity, fairness, greed avoidance, and modesty, about stress and mental health. Given the complexity and multidimensionality of the H-H construct, further research dissecting these subcomponents could reveal more detailed insights into how each aspect of H-H interacts with psychological outcomes.

Finally, while the study contributes to the understanding of the role of personality traits, such as H-H, in the context of stress and mental health among music students, it highlights the need for further research to explore these dynamics across diverse settings and populations. Expanding the scope of future studies to encompass diverse cultural backgrounds, educational disciplines, and age groups could provide a more comprehensive understanding of these important psychological relationships. Moreover, this study underscores the importance of integrating personality theory with emotional competence frameworks in future psychological research. While the applied relevance of supporting student mental health remains central, future investigations should also aim to refine theoretical models that account for the complex interactions between dispositional traits and stress regulation mechanisms. The findings here invite further exploration into the ethical, motivational, and regulatory dimensions of personality, which may influence not only mental health outcomes but also decision-making, interpersonal behavior, and coping strategies under pressure.

Practical and policymakers' implications

The exploration of stress, mental health, and emotional intelligence within the realm of music education presents significant practical implications for educators, students, and policymakers. Grounded in current research, these implications highlight the importance of integrating emotional intelligence training and mental health awareness into music education curricula to enhance both educational outcomes and student wellbeing.

For Practitioners and educators, the Emotional Skills Development approach should be applied. The role of music education in developing emotional skills is crucial. According to [Campayo-Muñoz and Cabedo-Mas \(2017\)](#), music education has a significant impact on emotional skill development, which in turn enhances wellbeing and cognitive performance. Educators should incorporate emotional intelligence training into music curriculums, leveraging music's inherent emotional richness as a tool for teaching these skills effectively. Secondly, holistic and individualized instruction would be beneficial. [Douwes et al. \(2023\)](#) highlight the importance of adopting holistic and individualized instructional methods, especially for students with emotional and behavioral disorders. Music educators should tailor their teaching approaches to meet the diverse emotional and psychological needs of students, promoting an inclusive and supportive learning environment. Third, Music Therapy Integration could be proposed. The effectiveness of music therapy in alleviating psychological stress and promoting mental health, as evidenced by [Qi \(2023\)](#), suggests that music educators and therapists should collaborate to integrate music therapy practices into educational settings. This could provide students with additional resources to manage stress and enhance their emotional wellbeing. Finally, Self-Care for Educators is needed. The necessity of implementing self-care practices among music educators is underscored by [Kuebel \(2019\)](#). Educators should

be equipped with knowledge and resources to manage their own stress and mental health, ensuring they can provide the best support for their students ([Payne et al., 2020](#)).

Regarding the policymakers, the main suggestions would be focused on the following points. First, policymakers should advocate for the inclusion of emotional intelligence and mental health components in music education curriculums. This would prepare students not only academically but also emotionally, equipping them with the skills necessary to navigate the challenges of their personal and professional lives. Second, allocating funding and resources for programs that integrate music education with emotional intelligence training and mental health awareness is essential. Investments in such programs can lead to improved educational outcomes and student wellbeing, contributing to the overall effectiveness of music education.

Third, policymakers should support professional development opportunities for music educators focused on emotional intelligence and mental health. Providing educators with the tools and knowledge to address these aspects within their teaching can enhance the educational experience for students. Fourth, continued research and evaluation of programs combining music education with emotional intelligence and mental health initiatives are crucial. Policymakers can support research efforts to better understand the impacts of these integrations and to inform future educational policies and practices.

In conclusion, the practical and policy implications of integrating stress management, mental health awareness, and emotional intelligence training into music education are manifold. By acknowledging and acting on these implications, educators and policymakers can significantly enhance the educational landscape for music students, fostering environments that support not only academic achievement but also emotional wellbeing and personal growth.

Conclusion

In conclusion, this study makes a significant contribution to the understanding of the intricate relationships among personality traits—specifically, H-H—and emotional intelligence, stress, and mental health within the context of music education in China. The findings underscore the crucial mediating role of trait emotional intelligence in mitigating the adverse effects of stress on mental health among music students. Additionally, the moderation analysis reveals that the H-H dimension of personality has a significant influence on this mediated relationship, with higher levels of H-H potentially enhancing the protective effect of emotional intelligence against stress-related mental health challenges.

The practical implications of these findings are particularly relevant for music educators, students, and policymakers. Integrating emotional intelligence training into music education curricula could serve as a strategic approach to bolstering students' resilience to stress, thereby improving their overall mental health and wellbeing. Moreover, recognizing the nuanced role of personality traits, such as honesty and humility, can guide the development of targeted interventions designed to support students in navigating the unique pressures inherent in music education.

However, this study is not without limitations. The cross-sectional design precludes definitive conclusions about causality,

and the use of self-reported measures may introduce bias. Additionally, the sample was drawn from a specific cultural context, which may limit the generalizability of the findings to other settings. Future research should aim to replicate these findings in more diverse educational contexts and consider employing longitudinal designs to establish causal relationships better. Further investigation into the specific mechanisms through which H-H and emotional intelligence interact will also be valuable, potentially leading to more tailored and effective educational and psychological interventions.

Ultimately, this study paves the way for a deeper, more nuanced understanding of the psychological processes at play in music education. By fostering emotional intelligence and considering personality traits in educational practices, institutions can better support students' mental health and contribute to their academic and personal success.

Data availability statement

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

Ethics statement

The studies involving humans were approved by Ethical Committee of the Fuyang 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.

References

- Abbasi, A. Z., and Sundas, A., & Ting, D. H. (2025). Validating the HEXACO Malay version as reflective-formative model: the application of hierarchical component model. *Cogent Psychol.*, 12, 2466311. doi: 10.1080/23311908.2025.2466311
- Al-Dassean, K. A. (2023). Psychometric properties of the Arabic version of the trait emotional intelligence questionnaire short form (TEIQUE-SF). *Cogent Psychol.* 10:2171184. doi: 10.1080/23311908.2023.2171184
- Amponsah, K. D., Adu-Gyamfi, K., Awoniyi, F. C., and Commey-Mintah, P. (2024). Navigating academic performance: unraveling the relationship between emotional intelligence, learning styles, and science and technology self-efficacy among preservice science teachers. *Heliyon* 10:e29474. doi: 10.1016/j.heliyon.2024.e29474
- Ashton, M. C., and Lee, K. (2009). The HEXACO-60: a short measure of the major dimensions of personality. *J. Pers. Assess.* 91, 340–345. doi: 10.1080/00223890902935878
- Bieda, A., Hirschfeld, G., Schönfeld, P., Brailovskaia, J., Zhang, X. C., and Margraf, J. (2017). Universal happiness? Cross-cultural measurement invariance of scales assessing positive mental health. *Psychol. Assess.* 29, 408–421. doi: 10.1037/pas0000353
- Campayo-Muñoz, E. Á., and Cabedo-Mas, A. (2017). The role of emotional skills in music education. *Br. J. Music Educ.* 34, 243–258. doi: 10.1017/S0265051717000067
- Chen, C. (2023). Mapping the terrain: a scoping review of empirical studies on the big five personality traits and quality of life in China. *Front. Psychol.* 14. doi: 10.3389/fpsyg.2023.1335657
- Chen, L. (2024). Delving into the role of self-efficacy in predicting motivation and engagement among music learners. *Learn. Motiv.* 86:101961. doi: 10.1016/j.lmot.2024.101961
- Cohen, S., Kamarck, T., and Mermelstein, R. (1983). A global measure of perceived stress. *J. Health Soc. Behav.* 24, 385–396. doi: 10.2307/2136404
- Cooper, A., and Petrides, K. V. (2010). A psychometric analysis of the trait emotional intelligence questionnaire–short form (TEIQUE–SF) using item response theory. *J. Pers. Assess.* 92, 449–457. doi: 10.1080/00223891.2010.497426
- Demirbatir, R. E. (2012). Undergraduate music student's depression, anxiety and stress levels: a study from Turkey. *Procedia Soc. Behav. Sci.* 46, 2995–2999. doi: 10.1016/j.sbspro.2012.05.603
- Douwes, R., Metselaar, J., Pijnenborg, G. H. M., and Boonstra, N. (2023). The well-being of students in higher education: the importance of a student perspective. *Cogent Educ.* 10:2190697. doi: 10.1080/2331186X.2023.2190697
- Ewaiwi, B. I., Attiyeh, R. K., Niroukh, E. A., Hijazi, B. Y., Adawi, S. O., Al-Qaissi, H. S., et al. (2024). Emotional intelligence among medical students and residents in Palestine: a cross-sectional study. *Migration Lett.* 21, 1704–1715. doi: 10.22541/au.158809487.70957539
- Fiorilli, C., Farina, E., Buonomo, I., Costa, S., Romano, L., Larcana, R., et al. (2020). Trait emotional intelligence and school burnout: the mediating roles of resilience and academic anxiety in high school. *Int. J. Environ. Res. Public Health* 17:3058. doi: 10.3390/ijerph17093058
- Fteiha, M., and Awwad, N. (2020). Emotional intelligence and its relationship with stress-coping style. *Health Psychol. Open* 7:2055102920970416. doi: 10.1177/2055102920970416
- García, L. F., Aluja, A., Rossier, J., Ostendorf, F., Glicksohn, J., Oumar, B., et al. (2022). Exploring the stability of HEXACO-60 structure and the association of gender, age, and social position with personality traits across 18 countries. *J. Pers.* 90, 256–276. doi: 10.1111/jopy.12664

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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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- Hayes, A. F. (2013). "Mediation, moderation, and conditional process analysis" in *Introduction to mediation, moderation, and conditional process analysis: a regression-based approach*, New York, NY: Guilford Publications. 1–20.
- Jääskeläinen, T. (2023). "Music is my life": examining the connections between music students' workload experiences in higher education and meaningful engagement in music. *Res. Stud. Music Educ.* 45, 260–278. doi: 10.1080/14613808.2020.1841134
- Jimenez Ballester, A. M., de la Barrera, U., Schoeps, K., and Montoya-Castilla, I. (2022). Emotional factors that mediate the relationship between emotional intelligence and psychological problems in emerging adults. *Behav. Psychol.* 30, 249–267. doi: 10.51668/bp.8322113n
- Kai, C. (2012). "The study on mental health educational role of music education" in *Information and business intelligence. IBI 2011. Communications in Computer and Information Science*. eds. X. Qu and Y. Yang, vol. 267 (Berlin, Heidelberg: Springer).
- Kamza, G., and Bazarbekova, R. (2023). The influence of music on the psycho-emotional state of students [СТУДЕНТТЕРДІҢ ПСИХОЭМОЦИОНАЛДЫҚ ЖАҒДАЙЫНА МУЗЫКАНЫҢ ӨСЕРІ]. *J. Psychol. Sociol.* 86, 27–35. doi: 10.26577/jpss.2023.v86.i3.0
- Kevereski, L., Dimovska, M. K., and Risteovski, D. (2016). The influence of the emotional intelligence in protection of the mental health in conditions of a psychosocial stress. *Int. J. Cognit. Res. Sci. Engin. Educ.* 4, 17–21. doi: 10.5937/IJCSEE1601017K
- Kuebel, C. (2019). Health and wellness for in-service and future music teachers: developing a self-care plan. *Music. Educ. J.* 105, 52–58. doi: 10.1177/0027432119846950
- Lee, Y.-J., and Seo, H.-J. (2018). The effect of emotional intelligence on Ego-resilience and self-efficacy. *Korean J. Sport Stud.* 57, 203–215. doi: 10.23949/kjpe.2018.11.57.6.15
- Leung, M. C., and Cheung, R. Y. M. (2020). Music engagement and well-being in Chinese adolescents: emotional awareness, positive emotions, and negative emotions as mediating processes. *Psychol. Music* 48, 105–119. doi: 10.1177/0305735618786421
- Leung, D. Y., Lam, T.-h., and Chan, S. S. (2010). Three versions of perceived stress scale: validation in a sample of Chinese cardiac patients who smoke. *BMC Public Health* 10, 1–7. doi: 10.1186/1471-2458-10-513
- Li, W., Wu, J., Guo, Z., and Kou, Y. (2023). Development of HEXACO personality traits and their relations with socioeconomic factors among Chinese adolescents: a three-wave longitudinal study. *Eur. J. Personal.* 37, 798–813. doi: 10.1177/08902070231174266
- Liu, Y., Liu, X., and Zheng, M. (2023). A correlation study of music training, adult attachment, and personality traits using a large-sample questionnaire. *Front. Psychol.* 14:1218848. doi: 10.3389/fpsyg.2023.1218848
- López-González, M. A., and Topa, G. (2024). Exposome determinants of quality of life in adults over 50: personality traits, childhood conditions, and long-term unemployment in SHARELIFE retrospective panel. *Psychol. Res. Behav. Manag.* 17, 4207–4220. doi: 10.2147/PRBM.S472044
- Lu, W., Bian, Q., Wang, W., Wu, X., Wang, Z., and Zhao, M. (2017). Chinese version of the perceived stress Scale-10: a psychometric study among Chinese university students. *PLoS One* 12:e0189543. doi: 10.1371/journal.pone.0189543
- Lukat, J., Margraf, J., Lutz, R., van der Veld, W., and Becker, E. (2016). Psychometric properties of the positive mental health scale (PMH scale). *BMC Psychol.* 4, 1–14. doi: 10.1186/s40359-016-0111-x
- Mellor, S., and Elliott, R. (2025). A construct validity study for the humility at work scale: item-content validity and convergent-discriminant validity. *Merits* 5:5. doi: 10.3390/merits5010005
- Molero-Jurado, M., Perez-Fuentes, M., Martinez Martos, A., Barragán Martin, A., Simon Marquez, M., and Gazquez Linares, J. J. (2021). Emotional intelligence as a mediator in the relationship between academic performance and burnout in high school students. *PLoS One* 16:e0253552. doi: 10.1371/journal.pone.0253552
- Nwokenna, E. N., Sewagegn, A. A., and Falade, T. A. (2022). Effects of educational music training on music performance anxiety and stress response among first-year undergraduate music education students. *Medicine* 101:e32112. doi: 10.1097/MD.00000000000032112
- Payne, P. D., Lewis, W., and McCaskill, F. (2020). Looking within: an investigation of music education majors and mental health. *J. Music. Teach. Educ.* 29, 50–61. doi: 10.1177/1057083720927748
- Petrides, K. V., and Furnham, A. (2000). On the dimensional structure of emotional intelligence. *Personal. Individ. Differ.* 29, 313–320. doi: 10.1016/S0191-8869(99)00195-6
- Pilch, I. (2023). Comparison of the big five and the HEXACO models of personality in the prediction of emotional wellbeing: an experience sampling study. *Trends Psychol.* 1–17. doi: 10.1007/s43076-023-00311-w
- Qi, S. (2023). An exploration of music therapy on relieving psychological stress of graduates. *Lecture Educ. Psychol. Public Media* 27, 216–220. doi: 10.54254/2753-7048/27/20231191
- Sacchetti, S., and Salustri, A. (2023). Teaching and playing? A survey on the well-being and motivations of young musicians. *Merits* 3, 521–537. doi: 10.3390/merits3030031
- Schutte, N. S., Malouff, J. M., Simunek, M., McKenley, J., and Hollander, S. (2002). Characteristic emotional intelligence and emotional well-being. *Cognit. Emot.* 16, 769–785. doi: 10.1080/02699930143000482
- Sun, J. (2022). Exploring the impact of music education on the psychological and academic outcomes of students: mediating role of self-efficacy and self-esteem. *Front. Psychol.* 13:841204. doi: 10.3389/fpsyg.2022.841204
- Sun, G., and Lyu, B. (2022). Relationship between emotional intelligence and self-efficacy among college students: the mediating role of coping styles. *Discov. Psychol.* 2:42. doi: 10.1007/s44202-022-00055-1
- Travis, J., Neale, C. A., and Wilgus, S. J. (2024). When dark personality gets darker: the intersection of injustice, moral disengagement, and unethical decision making. *Merits* 4, 414–430. doi: 10.3390/merits4040029
- Wang, H., Jia, R., Zhang, M., and Fan, W. (2024). The influence of stress on mental health among Chinese college students: the moderating role of psychological Suzhi. *Heliyon* 10:e26699. doi: 10.1016/j.heliyon.2024.e26699
- Wang, F., and Zeb, S. (2022). Impact of music education on mental health of higher education students: moderating role of emotional intelligence. *Front. Psychol.* 13:938090. doi: 10.3389/fpsyg.2022.938090
- Widodo, W., Gustari, I., and Chandrawaty, C. (2022). Adversity quotient promotes teachers' professional competence more strongly than emotional intelligence: evidence from Indonesia. *J. Intelligence* 10:44. doi: 10.3390/jintelligence10030044
- Wristen, B. G. (2013). Depression and anxiety in university music students. *Update: applications of research in music. Education* 31, 20–27. doi: 10.1177/8755123312473613
- Wu, Y., Sang, Z.-q., Zhang, X.-C., and Margraf, J. (2020). The relationship between resilience and mental health in Chinese college students: a longitudinal cross-lagged analysis. *Front. Psychol.* 11:450850. doi: 10.3389/fpsyg.2020.00108
- Zarei, F., Akbarzadeh, I., and Khosravi, A. (2019). The relationship between emotional intelligence and stress, anxiety, and depression among Iranian students. *Int. J. Health Stud.* 5. doi: 10.22100/ijhs.v5i3.668
- Zhang, Y., and Hu, J. (2024). Fatalism and depressive symptoms among Chinese college students: mediation models of locus of control and positive coping. *Heliyon* 10:e27617. doi: 10.1016/j.heliyon.2024.e27617
- Zhang, Y., Luo, X., Che, X., and Duan, W. (2016). Protective effect of self-compassion to emotional response among students with chronic academic stress. *Front. Psychol.* 7:218738. doi: 10.3389/fpsyg.2016.01802



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EDITED BY

María del Mar Molero Jurado,
University of Almería, Spain

REVIEWED BY

Mohammadsadegh Taghizadeh,
Golestan University, Iran
Yiting Tang,
The Hong Kong Polytechnic University,
Hong Kong SAR, China
Hazhira Qudsyi,
Islamic University of Indonesia, Indonesia

*CORRESPONDENCE

Zhou Du
✉ dz_wyyy@sina.com

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A mixed methods exploration of the interrelationships among self-compassion, stress management, psychological capital, and life satisfaction in Chinese university students

Ping Huang¹, Zhenxing Lin¹, BingRu Wang² and Zhou Du^{3*}

¹Graduate School, Wenzhou Medical University, Wenzhou, Zhejiang, China, ²Department of Student Affairs, Wenzhou University of Technology, Wenzhou, Zhejiang, China, ³The First Affiliated Hospital of Wenzhou Medical University, Wenzhou, Zhejiang, China

Introduction: This study explored the interrelationships between self-compassion, stress management, psychological capital (PsyCap), and life satisfaction among Chinese university students.

Methods: A mixed-methods approach was employed. The quantitative phase involved 478 students from six universities, with data analyzed using Structural Equation Modeling (SEM) to test hypothesized direct and indirect relationships among the variables. The qualitative phase included semi-structured interviews with a subsample of 30 participants.

Results: SEM results indicated that self-compassion and stress management positively influenced life satisfaction, both directly and indirectly, with PsyCap (comprising resilience, optimism, and self-efficacy) acting as a key mediator. PsyCap was strongly associated with higher life satisfaction. Multi-group SEM analyses showed no significant gender differences in the relationships among the variables. Qualitative findings offered deeper insights into students' experiences, highlighting challenges in balancing self-compassion with cultural and academic pressures, and confirmed PsyCap's role as a protective factor.

Discussion: The findings emphasize the importance of promoting self-compassion, adaptive stress management strategies, and psychological capital to enhance the well-being of university students, particularly in high-stress academic environments.

KEYWORDS

self-compassion, stress management, psychological capital, life satisfaction, mixed-methods, structural equation modeling, emotional resilience

Introduction

University students face significant academic stress, which impacts their mental health and life satisfaction (Cabras and Mondo, 2018; Luthans et al., 2007; Prasath et al., 2022; Seppälä et al., 2020). This stress, often linked to anxiety, depression, and burnout (Ciarrochi et al., 2002; Rabenu et al., 2017), is heightened in collectivist cultures like China, where

academic success ties to family honor and societal expectations (Cheung et al., 2016; López et al., 2018). Understanding psychological resources that help students manage these pressures is vital.

Self-compassion, involving kindness toward oneself during failure and recognizing shared human experiences, supports emotional regulation and resilience (Germer and Neff, 2013; Neff, 2003). It reduces self-criticism and boosts life satisfaction through adaptive coping strategies like mindfulness and positive reappraisal (Homan, 2016; Neff and Vonk, 2009; Richardson and Rothstein, 2008). Recent research has increasingly explored self-compassion in Chinese populations (e.g., Li et al., 2021; Wang and Lou, 2022; Chen, 2021), highlighting its role in wellbeing across diverse groups, such as self-quarantined residents during the COVID-19 pandemic and overseas Chinese students. Still, its interplay with resources like PsyCap and stress management in Chinese university students remains unclear.

Psychological Capital (PsyCap), encompassing self-efficacy, hope, resilience, and optimism, enhances wellbeing by aiding stress coping and goal pursuit (Avey et al., 2010; Culbertson et al., 2010; Luthans et al., 2007). Higher PsyCap levels correlate with adaptive coping strategies, such as problem-solving and mindfulness, improving stress management and life satisfaction (De Vibe et al., 2013; Flinchbaugh et al., 2015). While PsyCap has been studied in Chinese academic settings (e.g., Cao et al., 2024; Wang et al., 2023; Sun et al., 2022), particularly among PhD students and nursing students, its mediating role among self-compassion, stress management, and life satisfaction is underexplored.

Stress management, through adaptive strategies like mindfulness and social support, is critical for students' wellbeing (Querstret et al., 2020; Smith and Yang, 2017), while maladaptive strategies like avoidance increase distress (Ciarrochi et al., 2002; Roohafza et al., 2016). It is especially relevant in university settings, where students balance academic and personal demands (Freire et al., 2016; Roohafza et al., 2016). Recent studies on Chinese students (e.g., Jing et al., 2022; Shan et al., 2022) have emphasized stress management and coping styles, yet their interaction with self-compassion and PsyCap remains insufficiently investigated.

Despite progress, gaps persist. Research often examines self-compassion, PsyCap, and stress management separately or in specific groups (e.g., Cao et al., 2024; Li et al., 2021; Wang et al., 2023), neglecting their interrelationships in a broader sample of Chinese university students. Mixed-methods studies combining quantitative and qualitative data are scarce. While direct links between self-compassion, PsyCap, and life satisfaction are known, PsyCap's mediating role is unclear. Additionally, reconciling self-compassion with cultural norms favoring self-criticism for success in China remains unaddressed (Homan, 2016; López et al., 2018). These gaps highlight the need for culturally sensitive interventions.

This study investigates the relationships among self-compassion, stress management, PsyCap, and life satisfaction in Chinese university students, focusing on PsyCap's mediating role. Using a mixed-methods approach, it combines quantitative and qualitative data to explore how cultural norms shape these constructs and students' coping strategies.

Literature review

Self-compassion and emotional resilience

Self-compassion, rooted in Buddhist traditions, involves treating oneself with kindness during failure or inadequacy rather than engaging in harsh self-criticism (Allen and Leary, 2010; Germer and Neff, 2013; Neff, 2003). Neff's (2003) model includes self-kindness, common humanity, and mindfulness, which together build emotional resilience by helping individuals see suffering as a shared experience and respond to distress with mindful awareness (Neff, 2023; Neff and Knox, 2020). This compassionate approach not only mitigates immediate emotional distress but also establishes a foundation for enduring psychological strength.

Research shows self-compassion aids emotional regulation, reducing rumination and self-blame (Diedrich et al., 2014; Neff, 2011; Zessin et al., 2015). By decreasing negative self-focused thoughts, it lessens distress and fosters adaptive responses to stress (Marshall and Brockman, 2016; Terry and Leary, 2011), thereby enhancing psychological stability and enabling individuals to confront challenges more effectively (Germer and Neff, 2013; Marsh et al., 2018). These emotional regulation benefits extend to psychological capital—a set of resources including resilience, optimism, and wellbeing—which collectively improve stress management and life satisfaction (Avey et al., 2009; Finlay-Jones et al., 2015; Luthans et al., 2007; Rabenu et al., 2017).

Self-compassion bolsters emotional regulation, a key part of wellbeing (Crego et al., 2022; Inwood and Ferrari, 2018; Zhang and Fathi, 2024), by promoting mindful awareness that prevents maladaptive coping like avoidance (Bakker et al., 2019; Finlay-Jones et al., 2015; Kramer et al., 2023). This lowers anxiety and depression (Ewert et al., 2021; Zessin et al., 2015) and builds resilience and optimism, which are essential for life satisfaction. Self-compassion also boosts life satisfaction directly by reducing self-criticism and framing imperfections as universal (Hall et al., 2013; Mantelou and Karakasidou, 2017; Neff, 2003; Yang et al., 2016). It cushions daily stressors, enhancing self-concept and wellbeing (López et al., 2018; Pandey et al., 2021; Zessin et al., 2015), with interventions like mindfulness training showing long-term gains (Tran et al., 2024; Watson, 2024).

Cross-cultural studies confirm these benefits. Among Malaysian counselors, self-compassion increased resilience, supporting life satisfaction (Voon et al., 2022), showing its value across diverse settings (Bluth et al., 2017; Kotera and Van Gordon, 2021). In summary, self-compassion improves emotional regulation, stress management, and life satisfaction by fostering resilience and psychological capital. Its broad relevance makes it a critical focus for wellbeing interventions, especially in high-stress environments.

The role of stress management in mental health

Stress management involves strategies to regulate the emotional, psychological, and physical effects of stressors (Barlow, 2007; Seaward, 2017; Wright et al., 2013). According

to Lazarus and Folkman's (1984) transactional model, stress arises when individuals perceive an imbalance between situational demands and their coping abilities. This model is particularly relevant in academic settings, where students often face stress from performance and social pressures. Coping strategies—conscious efforts to handle stress—are categorized as adaptive or maladaptive. Adaptive strategies, like problem-solving and positive reappraisal, foster constructive engagement with stressors, enhancing wellbeing (Richardson and Rothstein, 2008). Maladaptive strategies, such as avoidance, may worsen stress and lead to emotional distress (Ciarrochi et al., 2002; Roohafza et al., 2016).

Adaptive coping addresses stress sources directly (Zeidner, 1995), using techniques like problem-solving, social support, and cognitive reappraisal. Problem-solving reduces stress by identifying solutions (Lazarus and Folkman, 1984; Murphy, 1996), while mindfulness-based practices, such as Mindfulness-Based Stress Reduction (MBSR), promote emotional regulation through present-moment awareness (De Vibe et al., 2013; Querstret et al., 2020). These strategies enhance wellbeing and life satisfaction by fostering control over stressors (De Witte et al., 2019; Morales-Rodríguez et al., 2020) and building psychological capital—resilience and optimism—central to life satisfaction (De Vibe et al., 2013; Ewert et al., 2021; Rabenu et al., 2017; Richardson and Rothstein, 2008).

Conversely, maladaptive strategies like avoidance or denial offer short-term relief but often exacerbate long-term psychological outcomes (Bonne et al., 2004; Sirois and Kitner, 2015). Avoidance, for example, prevents addressing stress causes, leading to prolonged distress and burnout (Suleman et al., 2018; Roohafza et al., 2016). Reliance on such strategies is linked to emotional exhaustion, especially in high-stress environments (Bittner et al., 2011; Richardson and Rothstein, 2008; Simpson et al., 2019). A meta-analysis by Richardson and Rothstein (2008) found that maladaptive coping predicts higher mental health disorder rates in chronically stressful settings.

Effective stress management is crucial for mental health and life satisfaction, a key aspect of subjective wellbeing (Madazimova and Mambetalina, 2024). Adaptive coping equips individuals to handle stress, reducing psychological distress and improving life satisfaction (De Vibe et al., 2013; De Witte et al., 2019; Morales-Rodríguez et al., 2020; Roohafza et al., 2016). Mindfulness interventions, for instance, lower anxiety and depression by enhancing emotional regulation (Querstret et al., 2020). In contrast, maladaptive coping correlates with lower life satisfaction, as it avoids addressing stress's root causes (Ciarrochi et al., 2002; Faul et al., 2010; Wicks, 2005; Suleman et al., 2018). Thus, promoting adaptive strategies is vital for mental health and life satisfaction, particularly among university students facing academic and social stressors. This aligns with the study's focus on how stress management interacts with self-compassion, psychological capital, and life satisfaction to support students in high-pressure environments (Riepenhausen et al., 2022).

Psychological capital and wellbeing

Psychological Capital (PsyCap) refers to an individual's positive psychological state, consisting of four core, interrelated

dimensions: self-efficacy, hope, resilience, and optimism (Loghman et al., 2023; Luthans et al., 2007; Newman et al., 2014). These dimensions function together, strengthening one another to provide the mental resources needed to handle challenges, improve wellbeing, and support success in various contexts (Avey et al., 2009). In university settings, where students face academic pressure and personal stress, PsyCap plays a key role in helping them cope, stay motivated, and maintain emotional health (Bandura, 1997; Luthans and Youssef-Morgan, 2017).

Each dimension of psychological capital contributes distinctly to psychological health, working together to support students in unique ways. Self-efficacy, the confidence in one's ability to succeed, drives persistence and reduces stress by giving students a sense of control over tasks like exams or assignments, as Bandura (1997) emphasizes. This control seamlessly connects to hope, which involves the will to achieve goals and the ability to find ways to reach them, helping students stay focused and adapt to setbacks in high-pressure academic environments, according to Snyder (2002). As students navigate these challenges, resilience steps in, enabling recovery from difficulties—such as a failed test—allowing them to bounce back and maintain emotional balance, a process Masten (2001) highlights as critical. Meanwhile, optimism, the belief in positive outcomes, encourages a forward-looking attitude that sustains motivation and wellbeing even during tough times, as Scheier and Carver (1985) describe, rounding out PsyCap's comprehensive support for psychological health.

Research shows PsyCap lowers stress, anxiety, and depression while boosting life satisfaction (Culbertson et al., 2010; Rabenu et al., 2017). Self-efficacy counters helplessness, optimism keeps spirits up, hope pushes goal pursuit, and resilience protects against burnout (Fathi et al., 2023), creating a combined effect that enhances mental health and a sense of fulfillment. Studies highlight these benefits in various groups, such as student-athletes managing dual demands (Kim et al., 2020), medical students facing intense training (Nafees and Jahan, 2017), and leaders in stressful roles (Gyu Park et al., 2017; Roche et al., 2014). For Chinese university students, who often deal with high academic expectations and cultural demands, PsyCap may be especially important for sustaining wellbeing and life satisfaction.

The value of PsyCap is clear in high-stress settings like universities. It reduces psychological distress in international students adjusting to new surroundings (Prasath et al., 2022) and links spiritual wellbeing to mental health in nursing students (Parviniannasab et al., 2022). Because PsyCap can be developed, interventions like resilience workshops or cognitive techniques to reframe negative thoughts offer practical ways to build these strengths, improving students' ability to cope and thrive (Amini et al., 2020).

In summary, PsyCap is vital for resilience, wellbeing, and life satisfaction. Its dimensions—self-efficacy, hope, resilience, and optimism—work together to help individuals manage stress and succeed in demanding environments. Strengthening PsyCap through targeted efforts could greatly benefit university students, particularly in high-stress academic contexts, enhancing their psychological health and overall satisfaction.

Life satisfaction and psychological resources

Life satisfaction, a central component of subjective wellbeing, reflects an individual's cognitive appraisal of their overall quality of life (Diener et al., 1985). Unlike transient emotional states, it offers a stable, long-term evaluation (Ehrhardt et al., 2000), integrating both hedonic (pleasure-oriented) and eudaimonic (meaning-driven) aspects of wellbeing (Martela and Sheldon, 2019; Ryan and Deci, 2001; Zhang et al., 2023). Key psychological resources—self-compassion, PsyCap, and effective stress management—play a significant role in shaping life satisfaction by fostering resilience, adaptive coping, and emotional stability (Avey et al., 2009; Homan, 2016).

Self-compassion, which involves treating oneself with kindness during setbacks, strengthens emotional resilience, reduces self-criticism, and enhances overall wellbeing, thereby contributing to higher life satisfaction (Neff, 2011; Cho et al., 2021). Studies demonstrate a positive association between self-compassion and life satisfaction across diverse age groups (Yang et al., 2016; Kim and Ko, 2018), suggesting that self-compassion supports emotional stability and facilitates effective coping with stress, both of which are essential for a fulfilling life.

PsyCap, a multifaceted construct encompassing self-efficacy, hope, resilience, and optimism, further promotes life satisfaction by equipping individuals with the tools to manage stress, pursue meaningful goals, and maintain a positive outlook (Datu and Valdez, 2016; Hite, 2015). For instance, during the COVID-19 pandemic, self-compassion and positive coping—integral elements of PsyCap—were associated with higher life satisfaction (Li et al., 2021). Specifically, hope, a core component of PsyCap, drives goal attainment and acts as a buffer against emotional challenges, thereby enhancing life satisfaction (Cotton Bronk et al., 2009; Gungor and Avci, 2017; Mantelou and Karakasidou, 2017).

Complementing these resources, effective stress management through adaptive strategies such as problem-solving and seeking social support is crucial for sustaining wellbeing and life satisfaction (Flinchbaugh et al., 2015; Smith and Yang, 2017). Interventions like mindfulness and cognitive-behavioral approaches have been shown to enhance emotional regulation and resilience, leading to increased life satisfaction (Clabaugh et al., 2021; Uraz et al., 2013; Freire et al., 2016). In contrast, reliance on maladaptive coping strategies, such as avoidance, is associated with reduced life satisfaction (Querstret et al., 2020).

In conclusion, self-compassion, PsyCap, and adaptive stress management are essential for fostering life satisfaction by helping individuals navigate challenges and pursue meaningful goals. The interplay of these resources creates a robust framework for emotional and psychological resilience, making interventions that target them particularly valuable in high-stress environments like universities, which aligns with the focus of this study.

The present study

This study explores the relationships between self-compassion, stress management, PsyCap, and life satisfaction among Chinese university students, addressing literature gaps and offering new

insights. To provide a clear framework, this study examines how self-compassion and stress management contribute to life satisfaction, with PsyCap posited as a key mediator, and investigates the moderating role of cultural factors such as academic pressure in a collectivist context. It integrates Hobfoll's (1989) Conservation of Resources (COR) theory and Fredrickson's (2001) broaden-and-build theory to explain these dynamics, aiming to test both direct and mediated pathways while exploring potential bidirectional effects. Prior research shows self-compassion reduces self-criticism, builds resilience, and supports adaptive coping strategies like mindfulness and positive reappraisal, directly enhancing life satisfaction through emotional regulation and stress reduction (Faul et al., 2010; Homan, 2016; Neff, 2011; Richardson and Rothstein, 2008). Recent studies in Chinese contexts have supported these findings (e.g., Li et al., 2021; Wang and Lou, 2022; Chen, 2021), but few have integrated self-compassion with PsyCap and stress management in a single model among university students.

PsyCap, encompassing self-efficacy, hope, resilience, and optimism, moderates stress and boosts life satisfaction by enabling effective coping (Avey et al., 2009; Luthans et al., 2007; Rabenu et al., 2017). It enhances resilience and goal pursuit, buffering stress and supporting wellbeing (Culbertson et al., 2010; Nielsen et al., 2017). While the role of PsyCap has been examined in Chinese academic settings (e.g., Cao et al., 2024; Wang et al., 2023), its mediating effect between self-compassion, stress management, and life satisfaction has not been fully investigated. Theoretically, PsyCap is hypothesized to mediate these relationships because it acts as a psychological resource reservoir, built through self-compassion and stress management, that enhances life satisfaction by mitigating stress and fostering adaptive functioning. According to COR theory (Hobfoll, 1989), individuals accumulate resources to cope with stress and pursue wellbeing; self-compassion provides emotional stability and stress management preserves resources, both cultivating PsyCap's components (e.g., resilience, hope), which in turn promote life satisfaction (Luthans et al., 2007; Neff, 2003). The broaden-and-build theory (Fredrickson, 2001) further explains this mediation: self-compassion's positive emotions broaden cognitive and emotional repertoires, building PsyCap attributes like optimism and resilience, which enhance life satisfaction in high-stress environments. Given its broad scope and relevance to academic contexts, we prioritized PsyCap as the primary mediator (Luthans et al., 2007). The present study will explore how PsyCap's dimensions interact with self-compassion and stress management to influence life satisfaction.

Stress management also promotes life satisfaction. Adaptive strategies like problem-solving and mindfulness correlate with higher satisfaction, while maladaptive strategies like avoidance link to distress (Ciarrochi et al., 2002; De Vibe et al., 2013; Querstret et al., 2020). Studies such as Jing et al. (2022), Shan et al. (2022) connect coping to outcomes in Chinese students, but interactions with self-compassion and PsyCap are less studied. This research investigates these dynamics to better understand wellbeing pathways.

To clarify the study's objectives, the following research questions and hypotheses guide this investigation:

- Research Question 1: What are the direct effects of self-compassion and stress management on life satisfaction among Chinese university students?
 - *Hypothesis 1*: Self-compassion will directly increase life satisfaction.
 - *Hypothesis 2*: Adaptive stress management will directly increase life satisfaction, while maladaptive strategies will decrease it.
- Research Question 2: Does PsyCap mediate the relationships between self-compassion, stress management, and life satisfaction?
 - *Hypothesis 3*: PsyCap will mediate the effects of self-compassion and stress management on life satisfaction.
- Research Question 3: How do cultural factors, such as academic pressure, influence these relationships?
 - *Hypothesis 4*: Cultural factors like academic pressure will moderate these relationships, potentially weakening the positive effects under high pressure.
- Research Question 4: Are there bidirectional relationships among these constructs?
 - *Hypothesis 5*: Qualitative data will explore whether higher life satisfaction reinforces self-compassion and PsyCap, suggesting bidirectional effects.

Figure 1 presents the hypothesized theoretical model. Distinct from this, a preliminary conceptual framework posits that self-compassion and stress management enhance life satisfaction directly and indirectly via PsyCap, with cultural factors moderating these pathways. This framework integrates COR and broaden-and-build theories to ground the mediation and moderation hypotheses.

Given the growing research in Chinese contexts, this study builds on recent findings by investigating these interrelationships

in a broader sample of Chinese university students. While some studies (e.g., Cao et al., 2024; Li et al., 2021) have examined these constructs in specific populations, this study offers a comprehensive model and a mixed-methods approach to provide statistical and narrative insights into cultural influences.

Finally, the study will explore potential bidirectional relationships. While self-compassion and PsyCap positively affect life satisfaction, higher life satisfaction may reinforce self-compassion and PsyCap, creating a positive feedback loop that strengthens resilience and wellbeing (Avey et al., 2010). This bidirectional perspective will be tested to offer a dynamic view of these interactions.

Additionally, self-compassion is consistently linked to adaptive coping strategies central to stress management, such as mindfulness and positive reappraisal (Homan, 2016; Neff and Vonk, 2009; Richardson and Rothstein, 2008; Sun et al., 2016). Neff and Vonk (2009) found self-compassion improves emotional regulation by reducing self-criticism, while Homan (2016) noted it fosters resilience through coping in older adults. Richardson and Rothstein's (2008) meta-analysis confirmed stress management interventions enhance wellbeing. Our data support this link ($r = 0.32, p < 0.01$). Following reviewer feedback, we conducted an exploratory mediation analysis to test stress management as an additional mediator between self-compassion and life satisfaction, complementing PsyCap and refining our understanding of wellbeing pathways in Chinese university students.

Materials and methods

Research design

This study used a mixed-methods design, combining quantitative and qualitative approaches to examine relationships among self-compassion, stress management, psychological capital, and life satisfaction in Chinese university students.

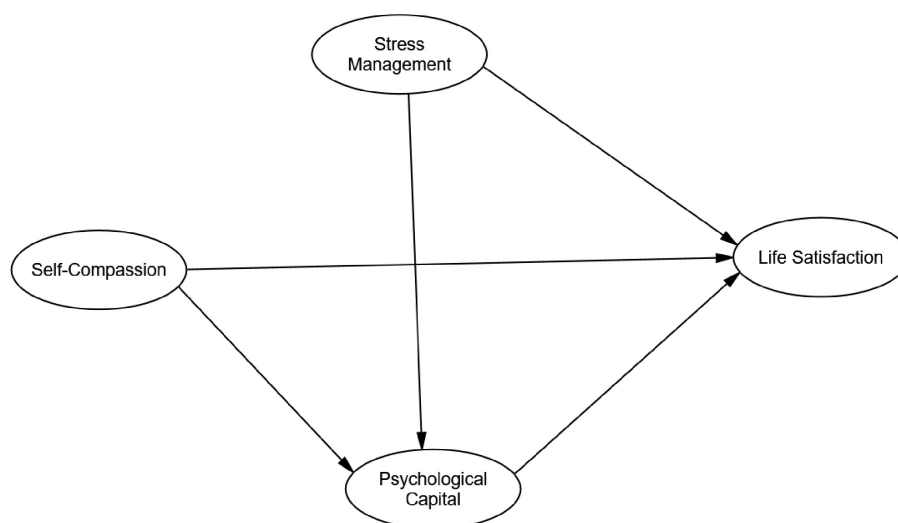


FIGURE 1
The hypothesized model.

A convergent parallel design was applied, with quantitative and qualitative data collected and analyzed separately before integration for a comprehensive understanding (Creswell and Plano Clark, 2018). The quantitative phase tested a hypothesized SEM to assess direct and indirect variable relationships. The qualitative phase used semi-structured interviews to explore participants' experiences with self-compassion, stress management, and wellbeing. This approach leveraged both data types' strengths for a detailed analysis of the constructs.

Participants and procedure

The study recruited 478 undergraduate and postgraduate students ($M_{age} = 20.5$, $SD = 2.3$; 59% female) from six universities across Mainland China. These universities were selected using a stratified sampling approach to ensure representation from different geographical regions and types of institutions. Specifically, the universities are located in various provinces, including two in the eastern region (e.g., Shanghai and Jiangsu), two in the central region (e.g., Hubei and Henan), and two in the western region (e.g., Sichuan and Shaanxi). This selection was intended to account for differences in economic development and sociocultural characteristics across China, providing a more diverse sample. These universities were chosen to reflect a wide variety of academic disciplines, ensuring representation from fields such as the humanities ($n = 100$, 20.9%), social sciences ($n = 120$, 25.1%), natural sciences ($n = 90$, 18.8%), engineering ($n = 80$, 16.7%), and business studies ($n = 88$, 18.4%). This diversity in academic backgrounds allowed for a broader understanding of the student population's experiences. The participants included undergraduate students ($n = 350$, 73.2%) and postgraduate students ($n = 128$, 26.8%), ranging from first-year undergraduates ($n = 120$, 25.1%) to postgraduate students ($n = 128$, 26.8%), capturing a wide spectrum of academic engagement and maturity levels. For a detailed breakdown of the demographic characteristics, see Table 1.

Eligible participants were between 18 and 25 years old (18–20 years: $n = 200$, 41.8%; 21–23 years: $n = 180$, 37.7%; 24–25 years: $n = 98$, 20.5%) and fluent in Mandarin Chinese. This age range was selected to focus on students transitioning from adolescence to early adulthood, a period typically marked by significant academic and personal development. The majority of the sample consisted of Han Chinese students ($n = 449$, 94%), consistent with the overall demographic distribution in Mainland China. The remaining 6% included students from various ethnic minority groups, such as Tibetan ($n = 10$, 2.1%), Uyghur ($n = 10$, 2.1%), and Zhuang ($n = 9$, 1.9%). This diversity provided valuable insights into how cultural background influences experiences related to self-compassion and stress management.

Recruitment efforts included email invitations, announcements on university online platforms, and in-person presentations in large lecture halls, aiming to engage students from a variety of faculties. Participation was voluntary, and all students provided informed consent before taking part in the study. Ethical approval was granted by the Institutional Review Board (IRB) of Wenzhou

TABLE 1 Demographic characteristics of participants.

Characteristic	Category	N	Percentage (%)
Gender	Female	282	59.0
	Male	196	41.0
Age	18–20 years	200	41.8
	21–23 years	180	37.7
	24–25 years	98	20.5
Academic level	Undergraduate	350	73.2
	Postgraduate	128	26.8
Year of study	First-year undergraduate	120	25.1
	Second-year undergraduate	100	20.9
	Third-year undergraduate	80	16.7
	Fourth-year undergraduate	50	10.5
	Postgraduate	128	26.8
Academic discipline	Humanities	100	20.9
	Social sciences	120	25.1
	Natural sciences	90	18.8
	Engineering	80	16.7
	Business studies	88	18.4
Ethnicity	Han Chinese	449	94.0
	Tibetan	10	2.1
	Uyghur	10	2.1
	Zhuang	9	1.9

Medical University, and participants were assured that their responses would remain confidential. All data were anonymized using unique identification codes to protect privacy.

For the qualitative phase, a purposive subsample of 30 participants was selected to ensure diversity in their self-reported life satisfaction scores. This subsample included students who reported high ($n = 10$), medium ($n = 10$), and low ($n = 10$) levels of life satisfaction, balanced in terms of gender (15 female, 15 male) and academic discipline (six humanities, seven social sciences, five natural sciences, six engineering, six business studies). Interviews were conducted in private rooms on campus, lasting 45–60 min, and were audio-recorded with consent. Transcriptions were anonymized to protect privacy.

Measures

Self-compassion

The Self-Compassion Scale (SCS; Neff, 2003) was used to assess participants' self-compassion levels. This 26-item scale measures responses to personal difficulties, focusing on self-kindness versus self-criticism, recognition of shared human experiences, and

constructive management of difficult emotions. For example, one item asks, “I try to be loving toward myself when I’m feeling emotional pain.” Participants rated each item on a five-point Likert scale ranging from 1 (*almost never*) to 5 (*almost always*). The total score is the mean of the 26 items, with possible scores ranging from 1 to 5, where higher scores indicate greater self-compassion. The Chinese version of the SCS, validated by Chen et al. (2011), was used. In this study, the SCS showed good internal consistency (Cronbach’s $\alpha = 0.88$). Confirmatory factor analysis (CFA) confirmed its construct validity in this sample, with fit indices indicating good model fit [$\chi^2/df = 2.56$, CFI = 0.93, TLI = 0.91, RMSEA = 0.056 [90% CI (0.043, 0.068)], SRMR = 0.047].

Stress management

Stress management was assessed using the Brief COPE inventory (Carver, 1997), a 28-item measure that evaluates a range of coping strategies individuals employ in response to stress. The scale comprises 14 subscales, each with two items. In this study, we focused on adaptive coping strategies to represent effective stress management. Participants rated each item on a four-point scale ranging from 1 (*I haven’t been doing this at all*) to 4 (*I’ve been doing this a lot*). The adaptive coping composite score, calculated by summing the 14 items from the adaptive subscales, ranges from 14 to 56, with higher scores indicating greater use of adaptive coping strategies. The Chinese version of the Brief COPE, adapted by Wang et al. (2018), was used. The adaptive coping composite showed acceptable internal consistency (Cronbach’s $\alpha = 0.85$). CFA supported its construct validity in this sample, with fit indices indicating good model fit [$\chi^2/df = 2.34$, CFI = 0.92, TLI = 0.90, RMSEA = 0.054 [90% CI (0.041, 0.066)], SRMR = 0.045].

Psychological capital

Psychological capital (PsyCap) was assessed using the Psychological Capital Questionnaire (PCQ; Luthans et al., 2015). This 24-item instrument measures four key dimensions: self-efficacy, hope, resilience, and optimism. Items such as “I’m always optimistic about my future” capture a participant’s overall psychological state and outlook. Participants responded on a six-point Likert scale ranging from 1 (*strongly disagree*) to 6 (*strongly agree*). The total PsyCap score is the mean of the 24 items, with possible scores ranging from 1 to 6, where higher scores reflect greater psychological capital. We used the Chinese version of the PCQ, which has demonstrated strong reliability and validity in previous research. In this study, the PCQ demonstrated high internal consistency (Cronbach’s $\alpha = 0.92$). CFA confirmed its construct validity, with fit indices indicating good model fit [$\chi^2/df = 2.11$, CFI = 0.94, TLI = 0.92, RMSEA = 0.049 [90% CI (0.037, 0.062)], SRMR = 0.042].

Life satisfaction

Life satisfaction was measured using the Satisfaction with Life Scale (SWLS; Diener et al., 1985). This five-item scale assesses

participants’ global judgments of their overall satisfaction with life. Sample items include “In most ways, my life is close to my ideal.” Participants rated each item on a seven-point Likert scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). The total score is the sum of the five items, with possible scores ranging from 5 to 35, where higher scores indicate greater life satisfaction. The SWLS was back-translated for this study to ensure cultural accuracy and has shown good reliability and validity in prior research (e.g., validated through pilot testing in this study; see section “Data collection process”). It exhibited high internal consistency (Cronbach’s $\alpha = 0.87$). CFA confirmed its construct validity, with fit indices indicating excellent model fit [$\chi^2/df = 1.87$, CFI = 0.95, TLI = 0.93, RMSEA = 0.045 [90% CI (0.032, 0.059)], SRMR = 0.041].

Semi-structured interviews

The semi-structured interview guide was designed to explore participants’ subjective experiences with self-compassion, stress management, psychological resilience, and life satisfaction. Key topics included participants’ approaches to self-compassion, coping mechanisms during academic and personal challenges, and perceptions of psychological capital. The guide allowed flexibility for interviewers to probe deeper into individual experiences. It was developed based on existing literature and pilot-tested with a small group of students to ensure clarity and relevance. Each interview lasted between 45 and 60 min and took place in a private, quiet room on the university campuses to ensure comfort and confidentiality. All interviews were audio-recorded with participants’ consent and transcribed verbatim for subsequent thematic analysis. Identifying information was removed during transcription to protect privacy.

Data collection process

Data collection was conducted over a 3 months period using a structured approach to ensure uniformity and data integrity. Participants were invited to complete an online survey via the Qualtrics platform, which was designed to be accessible on both desktop and mobile devices. The survey began with demographic questions, including age, gender, academic discipline, and year of study, followed by four psychometric measures. The survey took approximately 20 min to complete, and a progress bar was included to encourage participants to complete all sections and minimize dropout rates.

The survey’s introductory page included a consent form that outlined the study’s objectives, guaranteed the anonymity of participants, and clarified that the data would be used exclusively for research purposes. Participants were also informed that they could withdraw from the study at any time without any negative consequences. Each respondent was assigned a unique identification code, ensuring their responses remained anonymous, with no personally identifiable information collected.

To adapt the psychometric instruments to the Chinese context, all measures were translated into Mandarin through a forward- and back-translation process. Initially, bilingual experts translated

the instruments into Mandarin, followed by a separate group of bilingual professionals who back-translated the content into English. Any differences between the versions were reviewed and resolved to maintain conceptual accuracy. A pilot test with 30 Chinese university students was conducted to assess the clarity and cultural relevance of the translated items. Based on their feedback, minor adjustments were made to wording and item structure to enhance the measures' appropriateness for the target population.

For the qualitative phase, semi-structured interviews were conducted with a purposive subsample selected by life satisfaction scores. Interviews, held in private campus rooms, used flexible guides to explore self-compassion, stress management, and resilience. Transcripts were anonymized verbatim, enriching quantitative findings with insights into students' stress and psychological experiences.

Data analysis

Quantitative data were analyzed using SPSS (Version 28.0) for preliminary analyses and AMOS (Version 26.0) for structural equation modeling (SEM). Before SEM, we checked statistical assumptions. Normality was confirmed with skewness (-0.18 to 0.43) and kurtosis (-0.32 to 0.54) within acceptable ranges (Kline, 2015). Univariate outliers were identified using z -scores ($> \pm 3.29$), and multivariate outliers were detected via Mahalanobis distance ($p < 0.001$). Genuine outliers were retained, while extreme cases were removed, yielding 478 participants. Missing data ($< 5\%$) were addressed with multiple imputation (Rubin, 1987), as Little's MCAR test was non-significant ($\chi^2 = 18.62$, $df = 16$, $p = 0.29$).

Descriptive statistics (means, standard deviations, Pearson correlations) were calculated for self-compassion, stress management, psychological capital, and life satisfaction. All measures showed good internal consistency (Cronbach's $\alpha > 0.80$). SEM used maximum likelihood estimation to minimize bias (Bollen, 1989). The model proposed that self-compassion and stress management predict psychological capital, which mediates their effects on life satisfaction, with direct paths also included. The sample size (478) met the 10–20 participants-per-parameter ratio (Kline, 2015). Model fit was evaluated with χ^2 , CFI, TLI, RMSEA, and SRMR, with good fit defined as CFI and TLI > 0.90 , and RMSEA and SRMR < 0.08 (Hu and Bentler, 1999). Mediation was tested via bootstrapping (5,000 resamples) to estimate bias-corrected confidence intervals for indirect effects (Preacher and Hayes, 2008). To further explore the relationships, an additional mediation analysis tested whether stress management mediates the association between self-compassion and life satisfaction, controlling for psychological capital, using the same SEM framework and fit criteria (Neff and Vonk, 2009; Homan, 2016; Richardson and Rothstein, 2008).

Thematic analysis of qualitative data followed Braun and Clarke's (2006) six-phase framework, chosen for its flexibility in identifying patterns in participants' narratives. The lead researcher reviewed all 30 interview transcripts for familiarization. Initial coding was conducted inductively with NVivo 12, generating about 200 codes across transcripts. A second researcher independently coded six transcripts (20% of the total), selected randomly to represent varied life satisfaction levels from the quantitative data.

Interrater reliability, assessed with Cohen's $kappa$, reached $\kappa = 0.85$, indicating strong agreement (Landis and Koch, 1977). Coding disagreements were resolved through discussion, refining the framework for consistency. Axial coding then organized codes into conceptually related categories, followed by selective coding to distill overarching themes, with iterative constant comparison and negative case analysis ensuring analytical rigor and theme robustness. Themes were illustrated with participant quotes, enriching the quantitative findings.

A convergent parallel design (Creswell and Plano Clark, 2018) integrated qualitative themes with quantitative findings, enhancing the understanding of how self-compassion, stress management, and psychological capital relate to life satisfaction and strengthening study validity.

Results

Quantitative findings

Descriptive statistics and correlation analysis

Descriptive statistics were calculated for self-compassion, stress management, psychological capital, and life satisfaction across the participants. Table 2 presents the minimum, maximum, means, standard deviations, and Pearson correlation coefficients for these variables. Participants reported moderate levels of self-compassion (Min = 1.50, Max = 4.80, $M = 3.45$, $SD = 0.65$), stress management (Min = 18, Max = 52, $M = 38.5$, $SD = 7.20$), psychological capital (Min = 2.00, Max = 5.80, $M = 4.10$, $SD = 0.63$), and life satisfaction (Min = 7, Max = 33, $M = 23.5$, $SD = 5.50$).

Correlation analysis (Table 2) showed that self-compassion was positively correlated with psychological capital ($r = 0.45$, $p < 0.001$) and life satisfaction ($r = 0.37$, $p < 0.001$). Stress management was positively correlated with life satisfaction ($r = 0.27$, $p = 0.002$) and psychological capital ($r = 0.29$, $p < 0.001$). Psychological capital had the strongest correlation with life satisfaction ($r = 0.53$, $p < 0.001$).

Structural equation modeling

The structural equation model (SEM) showed good fit to the data: $\chi^2(254) = 305.62$, $p < 0.001$; $\chi^2/df = 1.20$; CFI = 0.94; TLI = 0.92; RMSEA = 0.042 [90% CI (0.038, 0.050)]; SRMR = 0.045. Figure 2 presents the path coefficients.

As indicated in Table 3, self-compassion had a significant positive effect on psychological capital ($\beta = 0.314$, $SE = 0.045$, $p < 0.001$). Stress management also positively affected psychological capital ($\beta = 0.351$, $SE = 0.042$, $p < 0.001$). Psychological capital had a strong positive effect on life satisfaction ($\beta = 0.517$, $SE = 0.037$, $p < 0.001$). Additionally, self-compassion ($\beta = 0.272$, $SE = 0.053$, $p = 0.002$) and stress management ($\beta = 0.316$, $SE = 0.049$, $p = 0.001$) had significant direct effects on life satisfaction.

As shown in Table 4, mediation analysis with 5000 bootstrapped resamples showed significant indirect effects of self-compassion ($\beta = 0.162$, $SE = 0.034$, 95% CI [0.11, 0.23]) and stress management ($\beta = 0.181$, $SE = 0.032$, 95% CI (0.13, 0.25)) on life satisfaction via psychological capital. The total effects were significant for self-compassion ($\beta = 0.434$, $SE = 0.048$, $p < 0.001$) and stress management ($\beta = 0.497$, $SE = 0.045$, $p < 0.001$) on life satisfaction.

TABLE 2 Descriptive statistics and correlations between variables (N = 478).

Variable	M	SD	Min	Max	1	2	3	4
1. Self-compassion	3.45	0.65	1.50	4.80	–	–	–	–
2. Stress management	2.75	0.54	18	52	0.32**	–	–	–
3. Psychological capital	4.10	0.63	2.00	5.80	0.45**	0.29**	–	–
4. Life satisfaction	4.65	1.10	7	33	0.37**	0.27**	0.53**	–

***p* < 0.01.

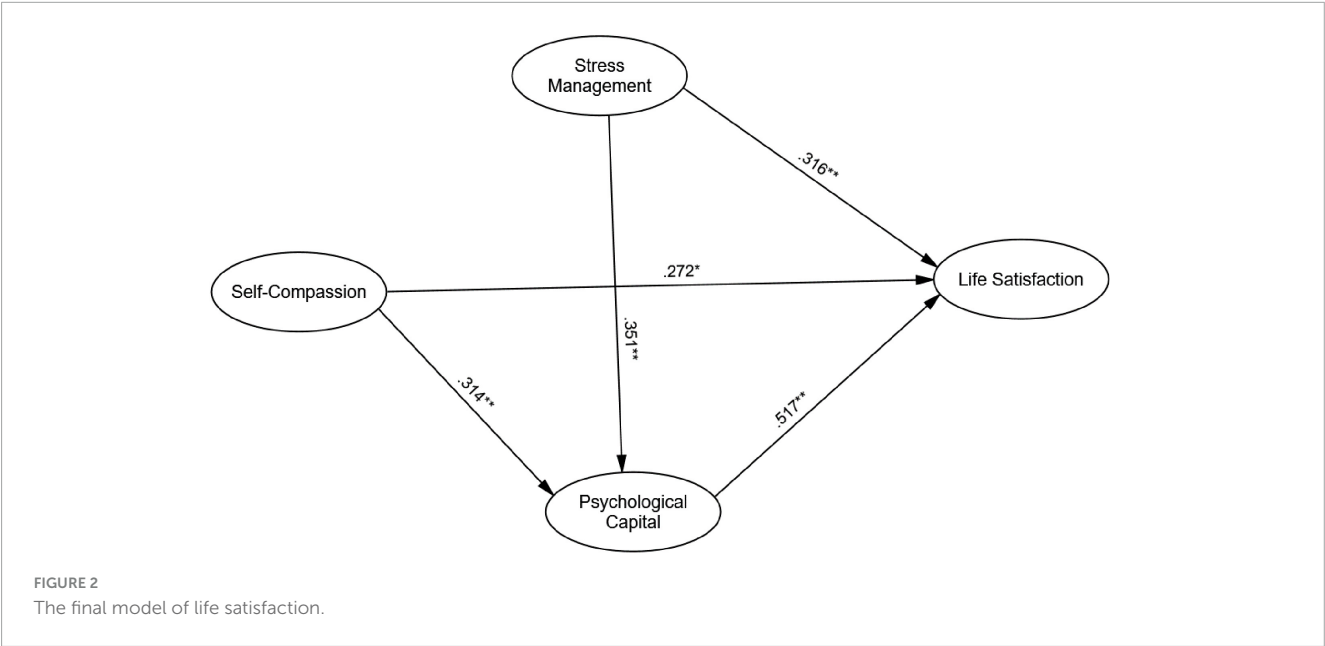


TABLE 3 Standardized path coefficients for direct effects (N = 478).

Path	Standardized coefficient (β)	SE	P-value
Self-Compassion → Psychological Capital	0.314	0.045	< 0.001
Stress Management → Psychological Capital	0.351	0.042	< 0.001
Psychological Capital → Life Satisfaction	0.517	0.037	< 0.001
Self-Compassion → Life Satisfaction	0.272	0.053	0.002
Stress Management → Life Satisfaction	0.316	0.049	0.001

Finally, multi-group SEM analyses were conducted on 196 male and 282 female participants to assess gender differences in the relationships among self-compassion, stress management, psychological capital, and life satisfaction. A chi-square difference test compared a constrained model (path coefficients fixed across genders) with an unconstrained model (path coefficients allowed to vary). The result was non-significant ($\Delta\chi^2(12) = 13.52, p = 0.34$), indicating consistent relationships across gender.

Structural equation modeling results showed significant direct effects of self-compassion ($\beta = 0.272, SE = 0.053, p = 0.002$) and stress management ($\beta = 0.316, SE = 0.049, p = 0.001$) on

life satisfaction, as well as indirect effects through psychological capital [self-compassion: $\beta = 0.162, SE = 0.034, 95\% \text{ CI } (0.11, 0.23)$; stress management: $\beta = 0.181, SE = 0.032, 95\% \text{ CI } (0.13, 0.25)$]. Psychological capital had a strong direct effect on life satisfaction ($\beta = 0.517, SE = 0.037, p < 0.001$). Total effects were significant for self-compassion ($\beta = 0.434, SE = 0.048, p < 0.001$) and stress management ($\beta = 0.497, SE = 0.045, p < 0.001$) on life satisfaction.

Exploratory mediation analysis: stress management as a mediator

We conducted an exploratory mediation analysis to examine whether stress management mediates the relationship between self-compassion and life satisfaction. Using SEM in AMOS with maximum likelihood estimation and 5,000 bootstrapped resamples, we modeled self-compassion as the predictor, stress management (adaptive coping composite from the Brief COPE) as the mediator, and life satisfaction as the outcome. PsyCap was included as a covariate to isolate the unique mediating effect of stress management.

The analysis showed a significant indirect effect of self-compassion on life satisfaction through stress management [$\beta = 0.095, SE = 0.025, 95\% \text{ CI } (0.05, 0.15), p < 0.01$]. Self-compassion positively predicted stress management ($\beta = 0.320, SE = 0.038, p < 0.001$), and stress management positively predicted life satisfaction ($\beta = 0.295, SE = 0.043, p < 0.001$). The direct effect of self-compassion on life satisfaction remained significant

TABLE 4 Indirect and Total effects of self-compassion and stress management on life satisfaction with bootstrapping ($N = 478$).

Predictor	Indirect effect via psychological capital	SE	95% CI	Total effect	SE	P-value
Self-compassion	0.162	0.034	(0.11, 0.23)	0.434	0.048	< 0.001
Stress management	0.181	0.032	(0.13, 0.25)	0.497	0.045	< 0.001

($\beta = 0.265$, $SE = 0.052$, $p < 0.05$), indicating partial mediation. Stress management accounted for approximately 26.4% of the total effect of self-compassion on life satisfaction. Model fit was acceptable: $\chi^2(256) = 310.25$, $p < 0.001$, $\chi^2/df = 1.21$, CFI = 0.93, TLI = 0.91, RMSEA = 0.045 [90% CI (0.040, 0.052)], SRMR = 0.048.

These results suggest that stress management partially mediates the relationship between self-compassion and life satisfaction, indicating that self-compassion enhances wellbeing not only directly but also by promoting adaptive coping strategies.

Qualitative findings

This phase explored participants' experiences with self-compassion, stress management, psychological capital, and life satisfaction through semi-structured interviews with 30 individuals varying in life satisfaction levels. Thematic analysis revealed four key themes: (1) balancing self-compassion with external pressures, (2) effects of maladaptive stress management, (3) psychological capital as a protective factor, and (4) cultural expectations influencing life satisfaction.

Balancing self-compassion with external pressures

Participants often struggled to reconcile self-compassion with the high academic and societal expectations placed on them. Those with higher life satisfaction described learning to view personal setbacks with kindness, which helped them handle pressures more effectively. For example, Participant 8 (high life satisfaction) noted, "I used to be hard on myself when things didn't go as planned, but now I focus on what I can learn instead of dwelling on mistakes." This shift allowed them to stay motivated while avoiding the emotional drain of self-criticism.

In contrast, participants with lower life satisfaction viewed self-compassion as potentially undermining their drive to succeed. Participant 22 (low life satisfaction) remarked, "Being kind to myself feels like making excuses; if I'm too lenient, I might not push myself hard enough." This tension illustrates a common cultural dilemma in the academic context of China, where familial and societal expectations emphasize achievement, often at the expense of personal wellbeing. These competing pressures demonstrate how external validation can conflict with self-compassion, contributing to stress.

Effects of maladaptive stress management

Participants who relied on avoidance or denial reported exacerbating their stress and emotional turmoil. Participant 16 (low life satisfaction) shared, "I avoid thinking about my stress by distracting myself, but the problems don't go away, and I feel even more anxious afterward." This maladaptive approach created a cycle where unresolved stressors intensified feelings

of helplessness and anxiety. The short-term relief offered by avoidance often led to long-term emotional stagnation, further compounding their distress.

In contrast, participants who employed adaptive strategies, such as seeking social support or reframing their challenges, reported more effective stress management. Participant 3 (high life satisfaction) explained, "Talking to my close friends helps me see problems differently and reduces my stress." This contrast highlights the importance of adaptive coping mechanisms in fostering emotional resilience. The findings suggest that targeted interventions focusing on the development of adaptive coping skills could significantly mitigate the negative emotional consequences of avoidance.

Psychological capital as a protective factor

Psychological capital, encompassing resilience, optimism, and self-efficacy, emerged as a critical resource for managing stress. Participants with higher psychological capital viewed difficulties as temporary and surmountable. Participant 10 (high life satisfaction) reflected, "Overcoming past challenges makes me confident I can handle new ones." This optimism and resilience allowed them to approach stressors with greater determination and emotional strength.

However, those with lower psychological capital expressed feeling overwhelmed by obstacles. Participant 27 (low life satisfaction) stated, "When things go wrong, it feels insurmountable. I can't see a way forward." This difference emphasizes how psychological capital functions as a protective buffer against stress, distinctly from self-compassion. Additionally, while resilience and optimism were particularly salient for participants with higher life satisfaction, the interplay between these dimensions of psychological capital suggests that interventions focusing on fostering all aspects—resilience, optimism, and self-efficacy—could further enhance stress management.

Cultural expectations influencing life satisfaction

Cultural and familial expectations significantly shaped participants' life satisfaction, particularly regarding academic achievement and the need to "save face" in Chinese culture. For many, self-worth was closely tied to meeting these expectations. Participant 12 (medium life satisfaction) remarked, "My happiness depends on doing well in school because my family places so much importance on academic success." The intense pressure to succeed often blurred the line between personal fulfillment and external validation, creating a source of constant stress.

Participants with higher life satisfaction, however, found ways to balance these cultural expectations with their personal wellbeing. Participant 4 (high life satisfaction) noted, "I realized my goals are as important as making my family proud. Balancing both has made

me feel more satisfied.” This balance highlights how individuals can navigate the tension between academic success and personal wellbeing by integrating family honor with self-compassion. In contrast, those with lower life satisfaction found it difficult to separate their happiness from academic performance, reinforcing the need for interventions that address these conflicting pressures. The role of “face” in Chinese culture and the influence of filial piety also add depth to understanding the cultural pressures participants face. Filial expectations, rooted in collectivist values, often amplify stress related to academic success and societal validation. Future research could explore how these cultural dynamics interact with psychological capital to influence life satisfaction.

Taken together, the qualitative findings indicate that participants who cultivated self-compassion and psychological capital were more capable of managing stress and demonstrating resilience. In contrast, those who relied on maladaptive strategies such as avoidance experienced greater emotional challenges. The role of cultural expectations was central in shaping life satisfaction, underscoring the importance of interventions that promote adaptive coping mechanisms, self-compassion, and psychological capital. These insights can inform strategies to support students in high-pressure academic environments, with a particular focus on addressing the cultural tensions between personal goals and societal expectations.

Discussion

This study investigated the relationships between self-compassion, stress management, PsyCap, and life satisfaction in a sample of Chinese university students, employing both quantitative and qualitative methods. Our findings provided substantial support for the hypothesized relationships, demonstrating both direct and indirect effects of self-compassion and stress management on life satisfaction, with PsyCap serving as a significant mediator.

One notable observation was the positive correlation between self-compassion and life satisfaction ($r = 0.37, p < 0.001$), aligning with prior research (Allen and Leary, 2010; Neff, 2011). However, this correlation does not imply causation and may be influenced by other factors such as unmeasured variables or shared method variance. Self-compassion emerged as a potentially vital resource for fostering resilience and mitigating stress (Allen and Leary, 2010; Neff, 2011; Terry and Leary, 2011). Higher self-compassion was associated with greater life satisfaction ($\beta = 0.272, p < 0.05$), an association that may reflect emotional regulation and reduced self-criticism (Amini et al., 2020; Neff, 2003; Sirois et al., 2015). This pattern suggests that self-compassion could support students in reframing setbacks as growth opportunities, which is particularly relevant in high-pressure academic environments like Chinese universities (López et al., 2018; Prasath et al., 2022). Qualitatively, students with higher life satisfaction used self-compassion to balance societal pressures with emotional needs, while those with lower satisfaction viewed it as a weakness, reflecting cultural barriers in achievement-focused contexts (Homan, 2016; Neff, 2011; Prasath et al., 2022). These insights suggest that self-compassion interventions could help students manage academic stress while preserving mental health (López et al., 2018; Neff,

2003; Neff, 2011), though further research is needed to confirm this potential.

The study also found a positive association between adaptive stress management and life satisfaction ($r = 0.27, p < 0.01$), consistent with prior research (De Vibe et al., 2013). However, the cross-sectional design limits causal inferences. Maladaptive strategies like avoidance were linked to lower life satisfaction, underscoring their negative impact (Ciarrochi et al., 2002; Holinka, 2015; Sirois and Kitner, 2015). Stress management influenced life satisfaction both directly and indirectly through PsyCap, with effective strategies preserving emotional resources and enhancing wellbeing (Richardson and Rothstein, 2008; Smith and Yang, 2017). Qualitative data showed that participants using adaptive strategies managed stress better, while those relying on maladaptive approaches reported helplessness. Promoting adaptive stress management in academic settings could thus significantly boost students' wellbeing (Freire et al., 2016; Querstret et al., 2020; Roohafza et al., 2016).

Mediation analysis indicated that PsyCap partially mediated the relationships between self-compassion and life satisfaction (indirect effect: $\beta = 0.162, p < 0.001$) and between stress management and life satisfaction (indirect effect: $\beta = 0.181, p < 0.001$). While these findings suggest PsyCap acts as an important mechanism, the partial nature of the mediation indicates that other unexamined factors may also play a role (Avey et al., 2010; Luthans et al., 2007; Siu et al., 2023). This aligns with Hobfoll's (1989) Conservation of Resources theory, where self-compassion and stress management help build PsyCap, enabling students to manage stress and sustain life satisfaction (Luthans et al., 2015; Prasath et al., 2022; Richardson and Rothstein, 2008). Qualitatively, students with higher PsyCap framed challenges as manageable, reflecting resilience and optimism (Culbertson et al., 2010; Luthans et al., 2007; Rabenu et al., 2017).

Exploratory analysis revealed stress management partially mediated the link between self-compassion and life satisfaction ($\beta = 0.095, p < 0.01$; 26.4% of the total effect), complementing PsyCap's broader mediation ($\beta = 0.162, p < 0.001$; 37.3%). This supports research showing self-compassion fosters adaptive coping strategies like mindfulness and positive reappraisal (Homan, 2016; Neff and Vonk, 2009; Richardson and Rothstein, 2008; Sun et al., 2016), consistent with our finding that self-compassion predicts stress management ($\beta = 0.320, p < 0.001$; page 4, lines 132–133). Self-compassion may reduce self-criticism, encouraging proactive coping (Neff, 2011), as seen in qualitative reports of students using mindfulness to reframe setbacks (Homan, 2016). These dual pathways—stress management as a specific behavioral mechanism and PsyCap as a broader psychological resource—align with COR theory: stress management prevents resource loss, while PsyCap drives resource gain (Hobfoll, 1989). However, the cross-sectional nature of our data precludes establishing temporal precedence, a key requirement for confirming mediation, necessitating longitudinal studies to validate these pathways. This refined model enhances our understanding of how self-compassion supports wellbeing, as suggested by the reviewer. Future research could pre-plan this mediation or test serial mediation (e.g., self-compassion $\rightarrow$ stress management $\rightarrow$ PsyCap $\rightarrow$ life satisfaction) to further elucidate their interplay.

Our findings align with and extend recent Chinese studies. Li et al. (2021) found self-compassion linked to life satisfaction via coping in males ($\beta = 0.21$, $p < 0.05$), and Wang and Lou (2022) reported a moderate correlation ($r = 0.40$ – 0.47) in collectivist societies. Our study confirms this ($\beta = 0.272$, $p < 0.05$) but adds PsyCap and stress management as mediators. Cao et al. (2024) tied PsyCap to wellbeing in PhD students, and Wang et al. (2023) found PsyCap mediated life satisfaction's effect on mental health in medical students ($\beta = -0.2103$). Our broader sample and mixed-methods design extend these findings, revealing cultural influences like academic pressure. Unlike Jing et al. (2022), who linked coping to health, or Shan et al. (2022) and Sun et al. (2022), who explored narrower mediators, our study integrates all four constructs. Chen (2021) compared overseas Chinese and Taiwanese students, but our focus on mainland students offers a distinct perspective. This study advances the field by: (1) integrating self-compassion, stress management, PsyCap, and life satisfaction; (2) identifying dual mediation pathways; and (3) using mixed methods to capture cultural nuances.

Cultural expectations also shaped these relationships. In China, academic success is tied to family honor, intensifying pressure (Cheung et al., 2016; López et al., 2018). Self-compassion and adaptive stress management helped students balance these demands, boosting life satisfaction (Mantelou and Karakasidou, 2017; Neff and Germer, 2013). However, some students saw self-compassion as conflicting with achievement, reflecting cultural norms valuing self-criticism (López et al., 2018). High parental expectations often tie self-worth to performance (Ahmet, 2008), but fostering self-compassion could help students maintain wellbeing (Homan, 2016; Neff, 2011). Programs teaching self-compassion and stress management could support this balance (Neff and Germer, 2013; Prasath et al., 2022).

Our findings suggest potential bidirectional relationships: higher life satisfaction may reinforce self-compassion and PsyCap, creating a feedback loop (Avey et al., 2010; Culbertson et al., 2010). This aligns with positive psychology (Luthans et al., 2007; Rabenu et al., 2017). Longitudinal studies are needed to explore these dynamics across cultures (Datu and Valdez, 2016; Rabenu et al., 2017). While our study addresses a gap in Chinese contexts, further research should examine cultural influences more broadly (López et al., 2018; Prasath et al., 2022) and explore PsyCap's dimensions (Avey et al., 2010; Luthans et al., 2007).

In summary, this mixed-methods study shows how self-compassion and stress management shape life satisfaction among Chinese university students, directly and via PsyCap. These insights can inform interventions to support students' resilience and wellbeing in high-pressure environments.

Implications

This study offers several important implications for educational institutions and mental health professionals working with university students, particularly in high-pressure academic settings such as China. A key finding was the significant positive effect of

self-compassion on life satisfaction, suggesting that universities should incorporate self-compassion training into their mental health services. Programs that promote self-kindness, such as workshops and counseling sessions, could help students manage academic stress and societal pressures more effectively. By fostering a mindset of self-compassion rather than self-criticism, these interventions may reduce stress and promote emotional resilience. In Chinese universities, where academic success is highly emphasized, such training could help alleviate the negative effects of external pressures by encouraging constructive emotional regulation.

The study also highlights the importance of stress management interventions that promote adaptive coping strategies, such as mindfulness and problem-solving. By providing students with these tools, institutions can reduce reliance on maladaptive strategies like avoidance and denial, which our study found to be associated with lower life satisfaction. Embedding practical stress management programs into academic curricula or offering them through counseling services could improve students' capacity to cope with academic challenges, leading to better mental health outcomes. Psychological capital, which was identified as a critical mediator between self-compassion, stress management, and life satisfaction, offers another important implication. PsyCap, composed of resilience, hope, optimism, and self-efficacy, is a trainable set of psychological resources. Institutions could introduce PsyCap development programs to help students manage academic pressures, maintain optimism, and recover from setbacks more effectively. Implementing PsyCap-focused interventions, particularly in high-stress environments like those in China, could support students in building long-term psychological resilience and contribute to both academic success and wellbeing.

The study also underscores the influence of cultural expectations on students' wellbeing, particularly in collectivist societies like China. The strong impact of societal and familial expectations on life satisfaction points to the need for culturally sensitive interventions. Programs that recognize the pressures related to academic success and family honor can help students navigate these demands without compromising their mental health. Culturally tailored support systems that balance academic goals with self-compassion may lead to more sustainable wellbeing for students facing high expectations. These culturally responsive interventions are crucial for promoting resilience among students who feel overwhelmed by external pressures.

Limitations

This study provides insights into the relationships among self-compassion, stress management, PsyCap, and life satisfaction but has several limitations. First, its cross-sectional design limits causal conclusions. While SEM suggests pathways and mediations, longitudinal studies are needed to examine how these constructs evolve over time and how interventions targeting self-compassion and PsyCap affect life satisfaction across students' academic stages.

Another limitation involves the generalizability of the findings. This research was conducted with Chinese university students, providing insight into how cultural pressures in a collectivist society

influence psychological wellbeing. However, it remains uncertain whether these results apply to other cultural or educational settings, particularly in non-collectivist societies. Although the stratified sampling approach was used to select six universities across different regions of Mainland China (two each from eastern, central, and western provinces) to capture regional diversity, China's wide range of sociocultural and economic differences may still limit the generalizability of the findings. These universities, while geographically spread, may not fully represent all variations within Chinese higher education due to factors such as regional disparities in development levels and local cultural norms. Future studies could include more universities from additional regions to improve the sample's representativeness and better assess how these factors influence the observed relationships. Replicating this study in diverse cultural contexts would help determine if the relationships between self-compassion, stress management, PsyCap, and life satisfaction hold across different environments. Cross-cultural comparisons could reveal whether the psychological mechanisms observed here are universally relevant or culturally specific.

The use of self-report measures introduces the potential for response bias. Although anonymity was ensured to reduce social desirability bias, participants may have answered in ways they thought were socially acceptable, particularly on sensitive topics like self-compassion and coping strategies. To mitigate this limitation, future research could incorporate additional methods such as peer evaluations or behavioral assessments to corroborate self-reported data, providing a more comprehensive understanding of how these constructs influence wellbeing.

Additionally, the exploratory analysis of stress management as a mediator was *post hoc*, not part of the original design, which prioritized PsyCap's broader role (Luthans et al., 2007). Prompted by reviewer feedback and a significant correlation ($r = 0.32$, $p < 0.01$), it aligns with prior work (Homan, 2016; Neff and Vonk, 2009). However, its preliminary nature (26.4% effect vs. PsyCap's 37.3%) suggests future studies should pre-plan this mediation, using longitudinal data to test stability and potential serial mediation (e.g., self-compassion → stress management → PsyCap → life satisfaction).

Lastly, the study did not explore possible bidirectional relationships. It is plausible that life satisfaction itself could enhance self-compassion and PsyCap, creating a reciprocal feedback loop that further strengthens psychological wellbeing. Future research should consider these bidirectional effects, particularly using longitudinal designs that track changes over time. By investigating these reciprocal dynamics, researchers can deepen their understanding of the interactions between self-compassion, stress management, and PsyCap, leading to more effective interventions that foster psychological resilience and life satisfaction.

Data availability statement

The data analyzed in this study is subject to the following licenses/restrictions: the data supporting the findings of this study are available from the corresponding author upon reasonable request. The dataset includes both quantitative survey responses

and qualitative interview transcripts, all anonymized to ensure participant confidentiality. Requests to access these datasets should be directed to ZD, Email: dz_wyyy@sina.com.

Ethics statement

The studies involving humans were approved by Institutional Review Board (IRB) of Wenzhou Medical 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

PH: Conceptualization, Data curation, Formal Analysis, Investigation, Methodology, Project administration, Software, Supervision, Validation, Writing – original draft, Writing – review and editing. ZL: Conceptualization, Data curation, Formal Analysis, Investigation, Methodology, Project administration, Software, Supervision, Validation, Writing – original draft, Writing – review and editing. BW: Conceptualization, Data curation, Formal Analysis, Investigation, Methodology, Project administration, Software, Supervision, Validation, Writing – original draft, Writing – review and editing. ZD: Conceptualization, Data curation, Formal Analysis, Investigation, Methodology, Project administration, Resources, Software, Supervision, Validation, Visualization, Writing – original draft, Writing – review and 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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References

- Ahmet, A. (2008). Self-compassion and achievement goals: A structural equation modeling approach. *Eurasian J. Educ. Res.* 31, 1–15.
- Allen, A. B., and Leary, M. R. (2010). Self-compassion, stress, and coping. *Soc. Pers. Psychol. Compass* 4, 107–118. doi: 10.1111/j.1751-9004.2009.00246.x
- Amini, M., Shehni Yailagh, M., and Hajiyakhchali, A. (2020). The causal relationship of psychological capital with psychological well-being and academic performance with the mediating role of social capital. *Positive Psychol. Res.* 6, 1–16. doi: 10.22108/ppls.2020.116114.1688
- Avey, J. B., Luthans, F., and Jensen, S. M. (2009). Psychological capital: A positive resource for combating employee stress and turnover. *Hum. Resour. Manag.* 48, 677–693. doi: 10.1002/hrm.20294
- Avey, J. B., Luthans, F., Smith, R. M., and Palmer, N. F. (2010). Impact of positive psychological capital on employee well-being over time. *J. Occup. Health Psychol.* 15, 17–28. doi: 10.1037/a0016998
- Bakker, A. M., Cox, D. W., Hubley, A. M., and Owens, R. L. (2019). Emotion regulation as a mediator of self-compassion and depressive symptoms in recurrent depression. *Mindfulness* 10, 1169–1180. doi: 10.1007/s12671-018-1060-2
- Bandura, A. (1997). *Self-Efficacy: The Exercise of Control*. New York, NY: W. H. Freeman.
- Barlow, D. H. (2007). *Principles and Practice of Stress Management*. New York, NY: Guilford Press.
- Bittner, J. G., Khan, Z., Babu, M., and Hamed, O. (2011). Stress, burnout, and maladaptive coping: Strategies for surgeon well-being. *Bull. Am. Coll. Surgeons* 96, 17–22.
- Bluth, K., Campo, R. A., Futch, W. S., and Gaylord, S. A. (2017). Age and gender differences in the associations of self-compassion and emotional well-being in a large adolescent sample. *J. Youth Adolesc.* 46, 840–853. doi: 10.1007/s10964-016-0567-2
- Bollen, K. A. (1989). *Structural Equations with Latent Variables*. Hoboken, NJ: Wiley.
- Bonne, O., Grillon, C., Vythilingam, M., Neumeister, A., and Charney, D. S. (2004). Adaptive and maladaptive psychobiological responses to severe psychological stress: Implications for the discovery of novel pharmacotherapy. *Neurosci. Biobehav. Rev.* 28, 65–94. doi: 10.1016/j.neubiorev.2003.11.004
- Braun, V., and Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Res. Psychol.* 3, 77–101. doi: 10.1191/1478088706qp0630a
- Cabras, C., and Mondo, M. (2018). Coping strategies, optimism, and life satisfaction among first-year university students in Italy: Gender and age differences. *Higher Educ.* 75, 643–654. doi: 10.1007/s10734-017-0161-x
- Cao, F., Zhang, L. F., Li, M., and Xie, Z. (2024). Subjective well-being among PhD students in mainland China: The roles of psychological capital and academic engagement. *Front. Psychol.* 15:1354451. doi: 10.3389/fpsyg.2024.1354451
- Carver, C. S. (1997). You want to measure coping but your protocol's too long: Consider the Brief COPE. *Int. J. Behav. Med.* 4, 92–100. doi: 10.1207/s15327558ijbm0401_6
- Chen, J., Yan, L., and Zhou, L. (2011). Reliability and validity of Chinese version of Self-compassion Scale. *Chinese J. Clin. Psychol.* 19, 734–736.
- Chen, P. L. (2021). Comparison of psychological capital, self-compassion, and mental health between overseas Chinese students and Taiwanese students in the Taiwan. *Pers. Individ. Dif.* 183:111131. doi: 10.1016/j.paid.2021.111131
- Cheung, W. Y., Maio, G. R., Rees, K. J., Kambale, S., and Mane, S. (2016). Cultural differences in values as self-guides. *Pers. Soc. Psychol. Bull.* 42, 769–781. doi: 10.1177/0146167216643930
- Cho, H., Yoo, S. K., and Park, C. J. (2021). The relationship between stress and life satisfaction of Korean university students: Meditational effects of positive affect and self-compassion. *Asia Pac. Educ. Rev.* 22, 385–400. doi: 10.1007/s12564-021-09720-8
- Ciarrochi, J., Deane, F. P., and Anderson, S. (2002). Emotional intelligence moderates the relationship between stress and mental health. *Pers. Individ. Dif.* 32, 197–209. doi: 10.1016/S0191-8869(01)00012-5
- Clabaugh, A., Duque, J. F., and Fields, L. J. (2021). Academic stress and emotional well-being in United States college students following onset of the COVID-19 pandemic. *Front. Psychol.* 12:628787. doi: 10.3389/fpsyg.2021.628787
- Cotton Bronk, K., Hill, P. L., Lapsley, D. K., Talib, T. L., and Finch, H. (2009). Purpose, hope, and life satisfaction in three age groups. *J. Posit. Psychol.* 4, 500–510. doi: 10.1080/17439760903271439
- Crego, A., Yela, J. R., Riesco-Matías, P., Gómez-Martínez, M. Á., and Vicente-Arruebarrena, A. (2022). The benefits of self-compassion in mental health professionals: A systematic review of empirical research. *Psychol. Res. Behav. Manag.* 15, 2599–2620. doi: 10.2147/PRBM.S359382
- Creswell, J. W., and Plano Clark, V. L. (2018). *Designing and Conducting Mixed Methods Research*, 3rd Edn. Thousand Oaks, CA: SAGE.
- Culbertson, S. S., Fullagar, C. J., and Mills, M. J. (2010). Feeling good and doing great: The relationship between psychological capital and well-being. *J. Occup. Health Psychol.* 15, 421–433. doi: 10.1037/a0020720
- Datu, J. A. D., and Valdez, J. P. M. (2016). Psychological capital predicts academic engagement and well-being in Filipino high school students. *The Asia Pac. Edu. Researcher* 25, 399–405. doi: 10.1007/s40299-015-0254-1
- De Vibe, M., Solhaug, I., Tyssen, R., Friberg, O., Rosenvinge, J. H., Sørli, T., et al. (2013). Mindfulness training for stress management: A randomized controlled study of medical and psychology students. *BMC Med. Educ.* 13:107. doi: 10.1186/1472-6920-13-107
- De Witte, N. A., Buyck, I., and Van Daele, T. (2019). Combining biofeedback with stress management interventions: A systematic review of physiological and psychological effects. *Appl. Psychophysiol. Biofeedback* 44, 71–82. doi: 10.1007/s10484-019-09435-0
- Diedrich, A., Grant, M., Hofmann, S. G., Hiller, W., and Berking, M. (2014). Self-compassion as an emotion regulation strategy in major depressive disorder. *Behav. Res. Therapy* 58, 43–51. doi: 10.1016/j.brat.2014.05.006
- Diener, E., Emmons, R. A., Larsen, R. J., and Griffin, S. (1985). The satisfaction with life scale. *J. Pers. Assess.* 49, 71–75. doi: 10.1207/s15327752jpa4901_13
- Ehrhardt, J. J., Saris, W. E., and Veenhoven, R. (2000). Stability of life-satisfaction over time. *J. Happiness Stud.* 1, 177–205. doi: 10.1023/A:1010084410679
- Ewert, C., Vater, A., and Schröder-Abé, M. (2021). Self-compassion and coping: A meta-analysis. *Mindfulness* 12, 1063–1077. doi: 10.1007/s12671-021-01571-x
- Fathi, J., Naderi, M., and Soleimani, H. (2023). Professional identity and psychological capital as determinants of EFL teachers' burnout: The mediating role of self-regulation. *Porta Linguarum Int. J. Foreign Lang. Teach. Learn.* 2023, 101–120. doi: 10.30827/portalin.vi2023c.29630
- Faul, L. A., Jim, H. S., Williams, C., Loftus, L., and Jacobsen, P. B. (2010). Relationship of stress management skill to psychological distress and quality of life in adults with cancer. *Psycho-Oncology* 19, 102–109. doi: 10.1002/pon.1530
- Finlay-Jones, A. L., Rees, C. S., and Kane, R. T. (2015). Self-compassion, emotion regulation and stress among Australian psychologists: Testing an emotion regulation model of self-compassion using structural equation modeling. *PLoS One* 10:e0133481. doi: 10.1371/journal.pone.0133481
- Flinchbaugh, C., Luth, M. T., and Li, P. (2015). A challenge or a hindrance? Understanding the effects of stressors and thriving on life satisfaction. *Int. J. Stress Manag.* 22, 323–345. doi: 10.1037/a0039136
- Fredrickson, B. L. (2001). The role of positive emotions in positive psychology: The broaden-and-build theory of positive emotions. *Am. Psychol.* 56, 218–226. doi: 10.1037/0003-066X.56.3.218
- Freire, C., Ferradás, M. D. M., Valle, A., Núñez, J. C., and Vallejo, G. (2016). Profiles of psychological well-being and coping strategies among university students. *Front. Psychol.* 7:1554. doi: 10.3389/fpsyg.2016.01554
- Germer, C. K., and Neff, K. D. (2013). Self-compassion in clinical practice. *J. Clin. Psychol.* 69, 856–867. doi: 10.1002/jclp.22021
- Gungor, A., and Avci, M. (2017). Examining the relationship between hope and life satisfaction among middle school students. *J. Pedagogical Res.* 1, 54–63. doi: 10.33902/jpr.201713379
- Gyu Park, J., Sik Kim, J., Yoon, S. W., and Joo, B. K. (2017). The effects of empowering leadership on psychological well-being and job engagement: The mediating role of psychological capital. *Leadersh. Organ. Dev. J.* 38, 350–367. doi: 10.1108/LODJ-08-2015-0182

- Hall, C. W., Row, K. A., Wuensch, K. L., and Godley, K. R. (2013). The role of self-compassion in physical and psychological well-being. *J. Psychol.* 147, 311–323. doi: 10.1080/00223980.2012.693138
- Hite, B. C. (2015). *Positive Psychological Capital, Need Satisfaction, Performance, and Well-Being in Actors and Stunt People* (Publication No. 3719467). [Doctoral dissertation]. Minneapolis: Walden University.
- Hobfoll, S. E. (1989). Conservation of resources: A new attempt at conceptualizing stress. *Am. Psychol.* 44, 513–524. doi: 10.1037/0003-066X.44.3.513
- Holinka, C. (2015). Stress, emotional intelligence, and life satisfaction in college students. *Coll. Student J.* 49, 300–311.
- Homan, K. J. (2016). Self-compassion and psychological well-being in older adults. *J. Adult Dev.* 23, 111–119. doi: 10.1007/s10804-016-9227-8
- Hu, L. T., and Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Struct. Equ. Model. Multidisciplinary J.* 6, 1–55. doi: 10.1080/10705519909540118
- Inwood, E., and Ferrari, M. (2018). Mechanisms of change in the relationship between self-compassion, emotion regulation, and mental health: A systematic review. *Appl. Psychol. Health Well-Being* 10, 215–235. doi: 10.1111/aphw.12127
- Jing, X., Meng, H., Li, Y., Lu, L., and Yao, Y. (2022). Associations of psychological capital, coping style and emotional intelligence with self-rated health status of college students in China during COVID-19 pandemic. *Psychol. Res. Behav. Manag.* 15, 2587–2597. doi: 10.2147/PRBM.S383743
- Kim, C., and Ko, H. (2018). The impact of self-compassion on mental health, sleep, quality of life, and life satisfaction among older adults. *Geriatric Nursing* 39, 623–628. doi: 10.1016/j.gerinurse.2018.06.005
- Kim, M., Oja, B. D., Kim, H. S., and Chin, J. H. (2020). Developing student-athlete school satisfaction and psychological well-being: The effects of academic psychological capital and engagement. *J. Sport Manag.* 34, 378–390. doi: 10.1123/jsm.2019-0211
- Kline, R. B. (2015). *Principles and Practice of Structural Equation Modeling*, 4th Edn. New York, NY: Guilford Press.
- Kotera, Y., and Van Gordon, W. (2021). Effects of self-compassion training on work-related well-being: A systematic review. *Front. Psychol.* 12:630798. doi: 10.3389/fpsyg.2021.630798
- Kramer, Z., Pellegrini, V., Kramer, G., and Barcaccia, B. (2023). Effects of insight dialogue retreats on mindfulness, self-compassion, and psychological well-being. *Mindfulness* 14, 746–756. doi: 10.1007/s12671-022-02012-4
- Landis, J. R., and Koch, G. G. (1977). An application of hierarchical kappa-type statistics in the assessment of majority agreement among multiple observers. *Biometrics* 33, 363–374. doi: 10.2307/2529786
- Lazarus, R. S., and Folkman, S. (1984). *Stress, appraisal, and coping*. Springer Publishing Company.
- Li, A., Wang, S., Cai, M., Sun, R., and Liu, X. (2021). Self-compassion and life satisfaction among Chinese self-quarantined residents during the COVID-19 pandemic: A moderated mediation model of positive coping and gender. *Pers. Individ. Dif.* 170:110457. doi: 10.1016/j.paid.2020.110457
- Loghman, S., Quinn, M., Dawkins, S., Woods, M., Om Sharma, S., and Scott, J. (2023). A comprehensive meta-analysis of the nomological network of psychological capital (PsyCap). *J. Leadersh. Organ. Stud.* 30, 108–128. doi: 10.1177/15480518221145456
- López, A., Sanderman, R., Ranchor, A. V., and Schroevers, M. J. (2018). Compassion for others and self-compassion: Levels, correlates, and relationship with psychological well-being. *Mindfulness* 9, 325–331. doi: 10.1007/s12671-017-0777-z
- Luthans, F., and Youssef-Morgan, C. M. (2017). Psychological capital: An evidence-based positive approach. *Annu. Rev. Organ. Psychol. Organ. Behav.* 4, 339–366. doi: 10.1146/annurev-orgpsych-032516-113324
- Luthans, F., Youssef-Morgan, C. M., and Avolio, B. J. (2015). *Psychological capital and beyond*. Oxford University Press.
- Luthans, F., Youssef, C. M., and Avolio, B. J. (2007). *Psychological Capital: Developing the Human Competitive Edge*. Oxford: Oxford University Press, doi: 10.1093/acprof:oso/9780195187526.001.0001
- Madazimova, K., and Mambetalina, A. (2024). Subjective well-being and emotion regulation of employees: The inhibitory role of stress factors. *Curr. Psychol.* 43, 27437–27446. doi: 10.1007/s12144-023-04322-7
- Mantelou, A., and Karakasidou, E. (2017). The effectiveness of a brief self-compassion intervention program on self-compassion, positive and negative affect, and life satisfaction. *Psychology* 8, 590–610. doi: 10.4236/psych.2017.84038
- Marsh, I. C., Chan, S. W., and MacBeth, A. (2018). Self-compassion and psychological distress in adolescents—A meta-analysis. *Mindfulness* 9, 1011–1027. doi: 10.1007/s12671-017-0850-7
- Marshall, E. J., and Brockman, R. N. (2016). The relationships between psychological flexibility, self-compassion, and emotional well-being. *J. Cogn. Psychotherapy* 30, 60–72. doi: 10.1891/0889-8391.30.1.60
- Martela, F., and Sheldon, K. M. (2019). Clarifying the concept of well-being: Psychological need satisfaction as the common core connecting eudaimonic and subjective well-being. *Rev. General Psychol.* 23, 458–474. doi: 10.1037/gpr0000203
- Masten, A. S. (2001). Ordinary magic: Resilience processes in development. *Am. Psychol.* 56, 227–238. doi: 10.1037/0003-066X.56.3.227
- Morales-Rodríguez, F. M., Espigares-López, I., Brown, T., and Pérez-Mármol, J. M. (2020). The relationship between psychological well-being and psychosocial factors in university students. *Int. J. Environ. Res. Public Health* 17:4778. doi: 10.3390/ijerph17134778
- Murphy, L. R. (1996). Stress management in work settings: A critical review of the health effects. *Am. J. Health Promot.* 11, 112–135. doi: 10.4278/0890-1171-11.2.112
- Nafees, N., and Jahan, M. (2017). Psychological capital (PsyCap) and mental well-being among medical students. *Int. J. Indian Psychol.* 4, 60–68. doi: 10.25215/0403.087
- Neff, K. D. (2003). The development and validation of a scale to measure self-compassion. *Self Identity* 2, 223–250. doi: 10.1080/15298860309027
- Neff, K. D. (2011). Self-compassion, self-esteem, and well-being. *Soc. Pers. Psychol. Compass* 5, 1–12. doi: 10.1111/j.1751-9004.2010.00330.x
- Neff, K. D. (2023). Self-compassion: Theory, method, research, and intervention. *Annu. Rev. Psychol.* 74, 193–218. doi: 10.1146/annurev-psych-032420-031202
- Neff, K. D., and Germer, C. K. (2013). A pilot study and randomized controlled trial of the mindful self-compassion program. *J. Clin. Psychol.* 69, 28–44. doi: 10.1002/jclp.21923
- Neff, K. D., and Knox, M. C. (2020). “Self-compassion,” in *Encyclopedia of Personality and Individual Differences*, eds V. Zeigler-Hill and T. K. Shackelford (Cham: Springer International Publishing), 4663–4670. doi: 10.1007/978-3-319-24612-3_1117
- Neff, K. D., and Vonk, R. (2009). Self-compassion versus global self-esteem: Two different ways of relating to oneself. *J. Pers.* 77, 23–50. doi: 10.1111/j.1467-6494.2008.00537.x
- Newman, A., Ucbasaran, D., Zhu, F., and Hirst, G. (2014). Psychological capital: A review and synthesis. *J. Organ. Behav.* 35, S120–S138. doi: 10.1002/job.1916
- Nielsen, K., Nielsen, M. B., Ogbornaya, C., Käsälä, M., Saari, E., and Isaksson, K. (2017). Workplace resources to improve both employee well-being and performance: A systematic review and meta-analysis. *Work Stress* 31, 101–120. doi: 10.1080/02678373.2017.1304463
- Pandey, R., Tiwari, G. K., Parihar, P., and Rai, P. K. (2021). Positive, not negative, self-compassion mediates the relationship between self-esteem and well-being. *Psychol. Psychother. Theory Res. Pract.* 94, 1–15. doi: 10.1111/papt.12282
- Parviniannasab, A. M., Bijani, M., and Dehghani, A. (2022). The mediating role of psychological capital in relations between spiritual well-being and mental health among nursing students. *BMC Psychol.* 10:230. doi: 10.1186/s40359-022-00845-8
- Prasath, P. R., Xiong, Y., Zhang, Q., and Jeon, L. (2022). Psychological capital, well-being, and distress of international students. *Int. J. Adv. Counsell.* 44, 529–549. doi: 10.1007/s10447-021-09457-7
- Preacher, K. J., and Hayes, A. F. (2008). Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models. *Behav. Res. Methods* 40, 879–891. doi: 10.3758/BRM.40.3.879
- Querstret, D., Morison, L., Dickinson, S., Cropley, M., and John, M. (2020). Mindfulness-based stress reduction and mindfulness-based cognitive therapy for psychological health and well-being in nonclinical samples: A systematic review and meta-analysis. *Int. J. Stress Manag.* 27, 394–412. doi: 10.1037/str0000165
- Rabenu, E., Yaniv, E., and Elizur, D. (2017). The relationship between psychological capital, coping with stress, well-being, and performance. *Curr. Psychol.* 36, 875–887. doi: 10.1007/s12144-016-9477-4
- Richardson, K. M., and Rothstein, H. R. (2008). Effects of occupational stress management intervention programs: A meta-analysis. *J. Occup. Health Psychol.* 13, 69–93. doi: 10.1037/1076-8998.13.1.69
- Riepenhausen, A., Wackerhagen, C., Reppmann, Z. C., Deter, H. C., Kalisch, R., Veer, I. M., et al. (2022). Positive cognitive reappraisal in stress resilience, mental health, and well-being: A comprehensive systematic review. *Emot. Rev.* 14, 310–331. doi: 10.1177/17540739221082226
- Roche, M., Haar, J. M., and Luthans, F. (2014). The role of mindfulness and psychological capital on the well-being of leaders. *J. Occup. Health Psychol.* 19, 476–489. doi: 10.1037/a0037183
- Roohafza, H., Feizi, A., Afshar, H., Mazaheri, M., Behnamfar, O., Hassanzadeh-Keshteli, A., et al. (2016). Path analysis of relationship among personality, perceived stress, coping, social support, and psychological outcomes. *World J. Psychiatry* 6, 248–257. doi: 10.5498/wjp.v6.i2.248
- Rubin, D. B. (1987). *Multiple Imputation for Nonresponse in Surveys*. Hoboken, NJ: Wiley.
- Ryan, R. M., and Deci, E. L. (2001). On happiness and human potentials: A review of research on hedonic and eudaimonic well-being. *Annu. Rev. Psychol.* 52, 141–166. doi: 10.1146/annurev.psych.52.1.141

- Scheier, M. F., and Carver, C. S. (1985). Optimism, coping, and health: Assessment and implications of generalized outcome expectancies. *Health Psychol.* 4, 219–247. doi: 10.1037/0278-6133.4.3.219
- Seaward, B. L. (2017). *Managing Stress*, 9th Edn. Burlington, MA: Jones & Bartlett Learning.
- Seppälä, E. M., Bradley, C., Moeller, J., Harouni, L., Nandamudi, D., and Brackett, M. A. (2020). Promoting mental health and psychological thriving in university students: A randomized controlled trial of three well-being interventions. *Front. Psychiatry* 11:534776. doi: 10.3389/fpsyg.2020.534776
- Shan, H., Ishak, Z., and Fan, L. (2022). The higher the life satisfaction, the better the psychological capital? Life satisfaction and psychological capital: A moderated mediation model. *Front. Psychol.* 12:772129. doi: 10.3389/fpsyg.2021.772129
- Simpson, S., Simionato, G., Smout, M., Van Vreeswijk, M. F., Hayes, C., Sougleris, C., et al. (2019). Burnout amongst clinical and counselling psychologists: The role of early maladaptive schemas and coping modes as vulnerability factors. *Clin. Psychol. Psychother.* 26, 35–46. doi: 10.1002/cpp.2332
- Sirois, F. M., and Kitner, R. (2015). Less adaptive or more maladaptive? A meta-analytic investigation of procrastination and coping. *Eur. J. Pers.* 29, 433–444. doi: 10.1002/per.1985
- Sirois, F. M., Kitner, R., and Hirsch, J. K. (2015). Self-compassion, affect, and health-promoting behaviors. *Health Psychol.* 34, 661–670. doi: 10.1037/hea0000158
- Siu, O. L., Lo, B. C. Y., Ng, T. K., and Wang, H. (2023). Social support and student outcomes: The mediating roles of psychological capital, study engagement, and problem-focused coping. *Curr. Psychol.* 42, 2670–2679. doi: 10.1007/s12144-021-02351-8
- Smith, G. D., and Yang, F. (2017). Stress, resilience, and psychological well-being in Chinese undergraduate nursing students. *Nurse Educ. Today* 49, 90–95. doi: 10.1016/j.nedt.2016.10.004
- Snyder, C. R. (2002). Hope theory: Rainbows in the mind. *Psychol. Inquiry* 13, 249–275. doi: 10.1207/S15327965PLI1304_01
- Suleman, Q., Hussain, I., Shehzad, S., Syed, M. A., and Raja, S. A. (2018). Relationship between perceived occupational stress and psychological well-being among secondary school heads in Khyber Pakhtunkhwa, Pakistan. *PLoS One* 13:e0208143. doi: 10.1371/journal.pone.0208143
- Sun, F., Wang, A., Xue, J., Su, J., Hu, C., and Lu, Q. (2022). The mediating effect of psychological capital on the relationship between psychological stress and distress among Chinese nursing students: A cross-sectional study. *BMC Nurs.* 21:128. doi: 10.1186/s12912-022-00915-0
- Sun, X., Chan, D. W., and Chan, L. K. (2016). Self-compassion and psychological well-being among adolescents in Hong Kong: Exploring gender differences. *Pers. Individ. Dif.* 101, 288–292. doi: 10.1016/j.paid.2016.06.011
- Terry, M. L., and Leary, M. R. (2011). Self-compassion, self-regulation, and health. *Self Identity* 10, 352–362. doi: 10.1080/15298868.2011.558404
- Tran, M. A. Q., Vo-Thanh, T., Soliman, M., Ha, A. T., and Van Pham, M. (2024). Could mindfulness diminish mental health disorders? The serial mediating role of self-compassion and psychological well-being. *Curr. Psychol.* 43, 13909–13922. doi: 10.1007/s12144-022-03478-8
- Uraz, A., Tocak, Y. S., Yozgatlıgil, C., Cetiner, S., and Bal, B. (2013). Psychological well-being, health, and stress sources in Turkish dental students. *J. Dental Educ.* 77, 1345–1355. doi: 10.1002/j.0022-0337.2013.77.10
- Voon, S. P., Lau, P. L., Leong, K. E., and Jaafar, J. L. S. (2022). Self-compassion and psychological well-being among Malaysian counselors: The mediating role of resilience. *Asia Pac. Educ. Researcher* 31, 475–488. doi: 10.1007/s40299-021-00585-1
- Wang, A. W. T., Cheng C. P., Chang C. S., Chen D. R., Chen S. T., Shieh V., et al. (2018). Does the factor structure of the brief COPE fit different types of traumatic events: A test of measurement invariance. *Eur. J. Psychol. Assess.* 34, 162–173. doi: 10.1027/1015-5759/a000321
- Wang, H., and Lou, X. (2022). The correlation between self-compassion and life satisfaction varies across societal individualism-collectivism: A three-level meta-analysis. *J. Cross Cult. Psychol.* 53, 1097–1116. doi: 10.1177/00220221221109547
- Wang, S., Li, H., Chen, X., Yan, N., and Wen, D. (2023). The mediating role of psychological capital in the association between life satisfaction and depressive and anxiety symptoms among Chinese medical students during the COVID-19 pandemic: A cross-sectional study. *BMC Psychiatry* 23:398. doi: 10.1186/s12888-023-04894-7
- Watson, G. L. (2024). Investigating the influence of self-esteem and self-compassion on adult life satisfaction: A longitudinal study. *Acta Psychol.* 3, 31–39.
- Wicks, R. J. (2005). *Overcoming Secondary Stress in Medical and Nursing Practice: A Guide to Professional Resilience and Personal Well-Being*. Oxford: Oxford University Press.
- Wright, T. A., Adkins, J. A., Nelson, D. L., and Quick, J. D. (2013). *Preventive Stress Management in Organizations*. Washington, DC: American Psychological Association, doi: 10.1037/14198-000
- Yang, Y., Zhang, M., and Kou, Y. (2016). Self-compassion and life satisfaction: The mediating role of hope. *Pers. Individ. Dif.* 98, 91–95. doi: 10.1016/j.paid.2016.03.086
- Zeidner, M. (1995). Adaptive coping with test situations: A review of the literature. *Educ. Psychol.* 30, 123–133. doi: 10.1207/s15326985ep3003_2
- Zessin, U., Dickhäuser, O., and Garbade, S. (2015). The relationship between self-compassion and well-being: A meta-analysis. *Appl. Psychol. Health Well-Being* 7, 340–364. doi: 10.1111/aphw.12051
- Zhang, L. J., and Fathi, J. (2024). The mediating role of mindfulness and emotion regulation in the relationship between teacher self-compassion and work engagement among EFL teachers: A serial mediation model. *System* 125:103433. doi: 10.1016/j.system.2024.103433
- Zhang, L. J., Fathi, J., and Mohammaddokht, F. (2023). Predicting teaching enjoyment from teachers' perceived school climate, self-efficacy, and psychological wellbeing at work: EFL teachers. *Perceptual Motor Skills* 130, 2269–2299. doi: 10.1177/00315125231182269

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