Psychology Research and Behavior Management

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ORIGINAL RESEARCH

The Role of Perceived Social-Emotional Competence in Adolescents' Mental Health: The Longitudinal Mediating Effect of Peer Relationship and Teacher-Student Relationship

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Introduction: Perceived social-emotional competence (PSEC) has been identified as a critical factor influencing adolescent mental health. However, limited research has explored the underlying mechanisms linking PSEC to both psychological distress and subjective well-being.

Methods: This longitudinal study investigated the associations among PSEC, psychological distress, and subjective well-being, as well as the potential mediating roles of peer relationships and teacher-student relationships. A sample of 452 adolescents (aged 16–19 years) participated in the study. Structural equation modeling was employed to examine the hypothesized mediation pathways.

Results: Correlational analyses showed significant associations among PSEC, subjective well-being, psychological distress, peer relationships, and teacher-student relationships. Longitudinal mediation analyses revealed that the relationship between PSEC and psychological distress was fully mediated by peer relationships. In contrast, the effects of PSEC on subjective well-being were explained by both direct effects and the mediating roles of peer and teacher-student relationships.

Discussion: These findings underscore the importance of supportive interpersonal relationships in adolescent mental health. The results suggest that enhancing peer and teacher-student relationships may be a valuable target for interventions aimed at strengthening the positive impact of PSEC.

Keywords: perceived social-emotional competence, psychological distress, well-being, relationship with peers and teachers

Introduction

The prevalence of mental disorders among adolescents has led to increased attention and research in the world.[1,2] The World Health Organization reports that mental health conditions account for 15% of the global burden of disease in people aged 10–19 years.[3] Adolescence is a time of significant developmental changes, which contribute to the emergence of various mental health issues.[4,5] It is estimated that approximately 70% of mental disorders start before the age of 18 years, and many persist into adulthood, making adolescence a crucial period for mental health promotion.[6] In addition, based on the dual-factor model, mental health is proposed as including two interrelated yet distinct dimensions – psychopathology and well-being.[7] Mental health is a complete state which including both positive and the absence of negative outcomes.[7,8] The positive dimension of mental health includes connectedness, perseverance, optimism, happiness, and engagement.[9] The negative side of mental health involves psychopathology (eg, depression, anxiety and stress), indicators of mental distress and mental disorders.[9] Thus, to gain a comprehensive understanding of adolescent mental health, it is essential to consider both outcomes.

Received: 23 April 2025
Accepted: 10 July 2025
Published: 15 July 2025

Perceived social-emotional competence (PSEC) describes an individual's perception that they are capable in their social-emotional interactions (ie both intra- and interpersonal), which playing vital role in healthy life adjustment.[10] PSEC was seen as the internal motivator that underpin the social-emotional competence process and accountable for initiating the behaviors.[11] Recent research has further elucidated the structure of PSEC, revealing that it comprises both an overarching global PSEC factor and specific factors.[12] Importantly, the global PSEC factor has been linked to key outcomes such as autonomous motivation and prosocial behavior, while also showing a negative association with conduct problems.[12] These findings highlight the central role of PSEC in shaping individuals' social-emotional functioning and overall well-being, while PSEC is closely related to other constructs such as emotional intelligence, self-efficacy, and social skills, it is conceptually distinct in that it captures one's self-perceived competence in managing both emotional and social challenges.[12]

Studies have consistently shown that adolescents with higher perceived social-emotional competence are more likely to experience positive mental health outcomes. For instance, PSEC is positively associated with positive affect, cognitive reappraisal, self-reflection, and prosocial behavior, while negatively associated with negative affect and conduct problems.[12] From a dual-factor model perspective, PSEC not only promotes well-being but also mitigates psychological distress. Specifically, adolescents with higher PSEC report greater emotional well-being and better relationships with peers and parents, which are key components of positive mental health.[13,14] Conversely, PSEC is negatively associated with psychological distress, anger, and stress, suggesting its protective role against negative mental health outcomes.[15] However, existing research on PSEC and adolescent mental health has primarily relied on cross-sectional designs, leaving it unclear whether these associations are sustained over time. Further longitudinal research is needed to determine the enduring impact of PSEC on both positive and negative mental health outcomes during this critical developmental phase.

Relationships with teachers and peers play a crucial role in adolescent development and well-being.[16] Positive interactions with teachers and peers promote well-being and resilience while reducing mental health problems.[17–19] Research also highlights the association between social-emotional competence and interpersonal relationships, particularly teacher-student and peer relationships.[10] As a core component of social-emotional competence, perceived social-emotional competence (PSEC) is positively linked to autonomy-supportive teaching and positive peer relationships.[12] These findings suggest that PSEC may foster healthy interpersonal relationships, which in turn support mental health. However, the mediating role of teacher and peer relationships in the PSEC-mental health link remains underexplored and requires further research.

Moreover, as adolescents progress through different developmental stages, the salience and impact of social relationships also change. For instance, peer relationships tend to become increasingly central during middle adolescence, while parental and teacher support may be more influential during early adolescence.[20] Therefore, understanding how these evolving relationships mediate the influence of PSEC on mental health is essential for capturing the developmental dynamics of adolescent well-being.

The study aimed to examine the association between PSEC and both psychological distress and subjective well-being from the perspective of dual-factor model of mental health. We also explored the mediating effects of relationships with peer and teacher in the association between PSEC and mental health. To gain a comprehensive understanding of the relationships between variables, two-time points data were collected with eight months apart. Based on the previous findings,[12] we proposed that PSEC can effectively predict the level of psychological distress and well-being, relationships with peers and teachers may be a potential pathway between the association between PSEC and mental health outcomes. Understanding these associations will inform targeted interventions to cultivate PSEC, thereby promoting well-being and reducing psychological distress during this critical developmental phase.

Materials and Methods

Participants

In October 2023, a cluster random sampling method was used to select a total of 493 second-year high school students in China as research participants. In June 2024, a second round of testing was conducted for the classes that participated in the first test. After matching the demographic information, valid data from 453 participants was obtained, resulting in

a dropout rate of 8.11%. Additionally, one participant was excluded because they did not answer any items on the teacher-student relationship scale, leaving a final total of 452 valid responses. The final sample included 240 boys, 211 girls, and 1 individual who did not indicate their gender. Moreover, there were 19 only children and 431 non-only children, with 2 participants not indicating their only child status. Regarding family structure, 56 came from single-parent families while 391 came from two-parent families, and 5 did not specify their family structure. Participants' ages ranged from 16 to 19 years, with a mean age of 16.77 ± 0.67 years, and 4 individuals did not provide their age.

The results of Little's MCAR test showed that the data were missing completely at random, $\chi^2(1664) = 1358.00$, $p = 0.98$. The independent samples *t*-test results indicated no significant differences between participants who dropped out and those who did not in terms of age ($t[487] = 0.04$, $p = 0.97$) and perceived social emotional competence ($t[491] = -0.92$, $p = 0.36$); the χ^2 tests showed no significant differences in gender ($\chi^2[1] = 0.66$, $p = 0.42$), whether being an only child ($\chi^2[1] = 2.76$, $p = 0.10$), and family structure ($\chi^2[1] = 1.81$, $p = 0.18$) between the two groups, indicating random dropout.

Measures

Perceived-Social and Emotional Competence (PSEC)

The PSEC, developed by Collie (2022) consists of 20 items divided into five dimensions: perceived competence for assertiveness, tolerance, social regulation, emotion regulation, and emotional awareness, with each dimension containing 4 items.[12] A 7-point Likert scale is used to score the responses, ranging from "strongly disagree" (1 point) to "strongly agree" (7 points), with higher scores indicating greater perceived social and emotional competence. The Chinese version of the PSEC was translated and back-translated multiple times by graduate students from the research team, and then reviewed and revised by a psychology expert fluent in both Chinese and English, based on psychometric standards. In this study, the Cronbach's alpha coefficients for the five dimensions and the total scale were 0.74, 0.72, 0.69, 0.90, 0.77, and 0.88, respectively. The results of the confirmatory factor analysis indicated good structural validity, with the following model fit indices: $\chi^2/df = 2.34$, GFI = 0.93, CFI = 0.94, TLI = 0.92, RMSEA = 0.05.

Engagement, Perseverance, Optimism, Connectedness and Happiness (EPOCH)

The EPOCH, developed by Kern et al and translated and revised by Dong et al (2018),[9,21] encompasses five dimensions: connectedness, perseverance, optimism, happiness, and engagement, with four items for each dimension, totaling 20 items. The scale employs a 5-point Likert scoring system, ranging from "not at all like me" (1 point) to "very much like me" (5 points), with higher scores indicating greater youth well-being. In this study, the internal consistency (α coefficients) for the five dimensions was found to be 0.73, 0.76, 0.76, 0.90, and 0.82, respectively, while the overall scale achieved a Cronbach's alpha coefficient of 0.92. The scale demonstrated good validity, with fit indices from confirmatory factor analysis as follows: $\chi^2/df = 3.27$, GFI = 0.90, CFI = 0.93, TLI = 0.90, RMSEA = 0.07.

The Depression Anxiety Stress Scale (DASS)

The DASS, developed by Lovibond et al (1995) and revised by Gong et al (2010),[22,23] comprises three dimensions: depression, anxiety, and stress, with each dimension containing 7 items, totaling 21 items. The scale uses a 4-point Likert scoring system, ranging from "does not apply at all" (1 point) to "applies very much" (4 points), with higher scores indicating higher levels of depression, anxiety, and stress. In this study, the Cronbach's alpha coefficients for the three dimensions and the overall questionnaire were 0.81, 0.77, 0.78, and 0.91, respectively, indicating good reliability. The validity was also confirmed, with the fitting indices from the confirmatory factor analysis as follows: $\chi^2/df = 2.62$, GFI = 0.91, CFI = 0.92, TLI = 0.90, RMSEA = 0.06.

Childhood and Adolescent Peer Relationship Questionnaire (CAPRQ)

The CAPRQ, revised by Zhang (2003) is a unidimensional scale, consisting of 22 items.[24] A 4-point Likert scoring system was used, ranging from "not at all" (1 point) to "always" (4 points), with a higher total score indicating poorer peer relationships. Following the approach of Wang and Liu (2024),[25] in order to ensure the consistency between scores and psychological function, a reverse scoring was applied to the final scores, meaning that a higher total score now represents better peer relationships. It was found that the Cronbach's alpha coefficient of this questionnaire in the current study was 0.84.

Teacher-Student Relationship Questionnaire (TSRQ)

The TSRQ, developed by Wang and Wang (2002) and revised by Zou et al (2002),[26,27] includes two directions and four dimensions: intimacy, support, satisfaction, and conflict, totaling 23 items. This scale employs a 5-point Likert scoring system, ranging from "strongly disagree" (1 point) to "strongly agree" (5 points). Higher scores in the first three dimensions indicate a more positive or affirmative teacher-student relationship, while higher scores in the conflict dimension suggest a more negative relationship. To ensure consistency in the psychological functions across the dimensions, items related to conflict were reverse scored; thus, a higher score indicates lower conflict between teachers and students. After adjustment, the Cronbach's alpha coefficients for the four dimensions and the overall scale in this study were 0.82, 0.77, 0.78, 0.87, and 0.90, respectively. The validity is good, with the fit indices from the confirmatory factor analysis: $\chi^2/df = 2.73$, GFI = 0.90, CFI = 0.92, TLI = 0.91, RMSEA = 0.06.

Common Method Bias Test

To avoid the impact of common method bias on the results, we implemented procedural controls during the administration of the questionnaire, including response format, response statements, anonymity, and confidentiality during responses. After the questionnaires were collected, we conducted a Harman one-factor test (Podsakoff et al, 2003),[28] which involved exploratory factor analysis of all items. The results showed that in the unrotated principal component analysis, there were 23 factors with eigenvalues greater than 1, and the first factor explained only 18.57% of the variance. According to the criteria set by Ashford and Tsui (1991),[29] if multiple factors with eigenvalues greater than 1 are found and the first factor explains no more than 40% of the variance, it indicates that common method variance is not severe. Therefore, the issue of common method bias is not serious in this study.

Procedure

A standardized set of instructions was used and trained high school mental health education teachers conducted cluster testing with the participants. The participants were informed about the confidentiality of the questionnaire, the importance of providing truthful responses, the precautions to take while filling it out, and the methods for completing it. After the participants comprehended these instructions, they answered the questions individually, and the completed questionnaires were collected on the class. The entire testing process took approximately 10 minutes.

Data Analysis

Firstly, SPSS 22.0 was employed for data preprocessing, where missing values were replaced using the series mean, followed by reverse scoring and summation. Secondly, descriptive statistics and correlation analysis were conducted using SPSS 22.0. Finally, a structural equation model was constructed using Amos 24.0. Based on the recommendations of Wen et al (2004),[30] the Root Mean Square Error of Approximation (RMSEA) was considered acceptable if it was below 0.08, while the Comparative Fit Index (CFI), Goodness-of-Fit Index (GFI), and Tucker-Lewis Index (TLI; also known as Non-Normed Fit Index, NNFI) were considered good if they were above 0.90.

Results

Descriptive Statistics and Correlation Analysis

Pearson correlation analysis of the main variables revealed that there were significant correlations between the PSEC, subjective well-being, psychological distress, peer relationships, and teacher-student relationships (ps < 0.001). Except for the scores on the DASS scale, which showed a significant negative correlation with other variables, all other variables demonstrated significant positive correlations with each other. The results of the descriptive statistics and correlation analysis are presented in Table 1.

Table 1 Descriptive Statistics and Correlation Analysis Results

	1	2	3	4	5
1. PSEC (T1)	1				
2. EPOCH (T2)	0.49***	1			
3. DASS (T2)	−0.32***	−0.42***	1		
4. CAPRQ (T2)	0.43***	0.48***	−0.58***	1	
5. TSRQ (T2)	0.39***	0.49***	−0.32***	0.39***	1
M	92.49	63.13	39.09	59.89	80.10
SD	15.85	14.06	10.74	9.54	12.67

Note: ***p < 0.001.

Abbreviations: PSEC, Perceived-Social and Emotional Competence; EPOCH, Engagement, perseverance, optimism, connectedness and happiness; DASS, The Depression Anxiety Stress Scale; CAPRQ, Childhood and Adolescent Peer Relationship Questionnaire; TSRQ, Teacher-Student Relationship Questionnaire; T1, Time Point 1; T2, Time Point 2.

Longitudinal Mediation Effect

Based on the results of the correlation analysis, it is evident that PSEC at time point 1 is significantly correlated with subjective well-being, psychological distress (including depression, anxiety, and stress), peer relationships, and teacher-student relationships at time point 2. This meets the requirements for testing the mediation model. Therefore, structural equation modeling was further employed, with PSEC at time point 1 as the independent variable, and subjective well-being and psychological distress at time point 2 as the dependent variables, to explore the mediating effect of interpersonal relationships (including peer relationships and teacher-student relationships) at time point 2. The results show that the fit indices of the model are satisfactory: $\chi^2/df = 2.68$, GFI = 0.93, CFI = 0.95, TLI = 0.93, RMSEA = 0.06.

As shown in Table 2, the relationships between PSEC and peer relationships ($\beta = 0.50$, $t = 8.51$, $p < 0.001$), teacher-student relationships ($\beta = 0.48$, $t = 5.30$, $p < 0.001$), and subjective well-being ($\beta = 0.33$, $t = 5.01$, $p < 0.001$) were significant. The relationships between peer relationships and subjective well-being ($\beta = 0.24$, $t = 4.93$, $p < 0.001$) and psychological distress ($\beta = -0.54$, $t = -10.41$, $p < 0.001$) were also significant. Additionally, the relationship between teacher-student relationships and subjective well-being ($\beta = 0.30$, $t = 4.45$, $p < 0.001$) was significant as well. However, the relationships between PSEC ($\beta = -0.11$, $t = -1.74$, $p = 0.08$) and teacher-student relationships ($\beta = -0.04$, $t = -0.83$, $p = 0.41$) with psychological distress were not significant. Moreover, the relationships between teacher-student

Table 2 The Statistical Analysis Results of the Model

	β	t
PSEC (T1) – CAPRQ (T2)	0.50	8.51***
PSEC (T1) – TSRQ (T2)	0.48	5.30***
PSEC (T1) – EPOCH (T2)	0.33	5.01***
CAPRQ (T2) – EPOCH (T2)	0.24	4.93***
CAPRQ (T2) – DASS (T2)	−0.54	−10.41***
TSRQ (T2) – EPOCH (T2)	0.30	4.45***
PSEC (T1) – DASS (T2)	−0.11	−1.74
TSRQ (T2) – DASS (T2)	−0.04	−0.83
TSRQ (T2) – CAPRQ (T2)	0.18	2.83**
EPOCH (T2) – DASS (T2)	−0.21	−3.36***

Note: **p < 0.01; ***p < 0. 001.

Abbreviations: PSEC, perceived social-emotional competence; CAPRQ, peer relationship; TSRQ, teacher-student relationship; EPOCH, subjective well-being; DASS, psychological distress; T1, Time Point 1; T2, Time Point 2.

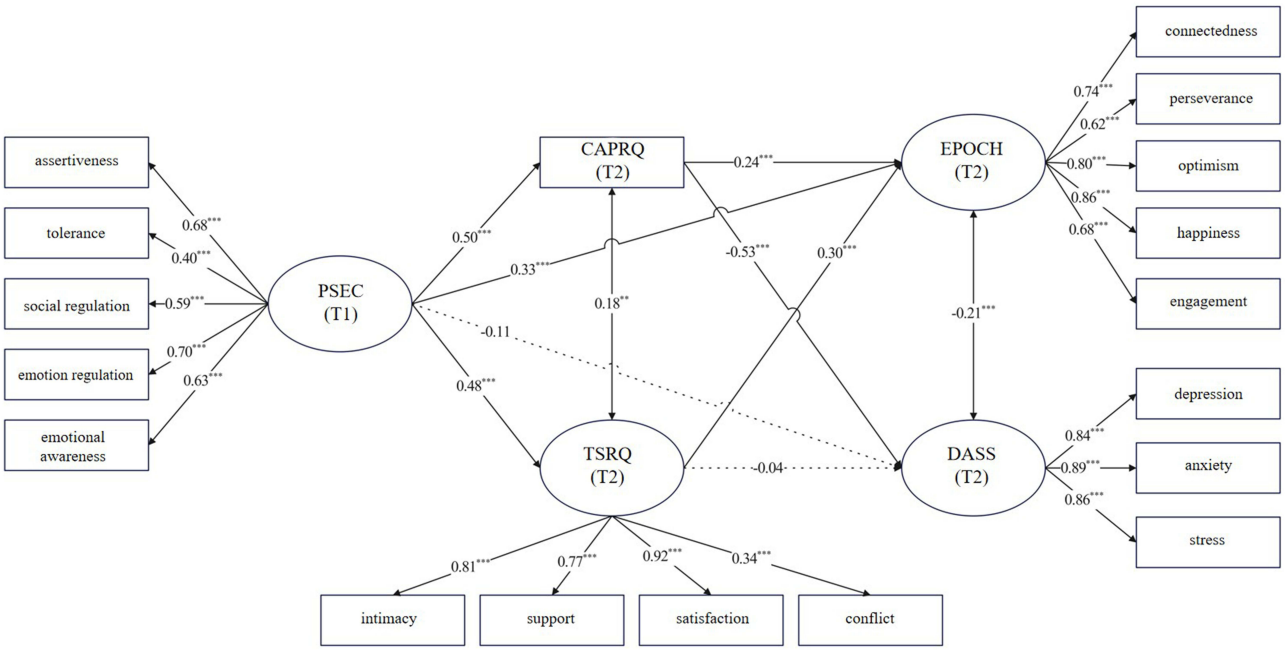

Figure 1 Longitudinal mediation model illustrating the effect of perceived social-emotional competence (PSEC) at Time 1 on adolescent mental health outcomes at Time 2 through peer (CAPRQ) and teacher-student relationships (TSRQ). Standardized path coefficients are shown. Solid lines indicate significant paths; dashed lines indicate non-significant paths. *p <0.05, **p <0.01, ***p <0.001.

relationships and peer relationships (r = 0.18, t = 2.83, p = 0.01), as well as subjective well-being and psychological distress (r = −0.21, t = −3.36, p < 0.001) were also significant in Figure 1.

In summary, the effects of PSEC on psychological distress mainly occurred through the complete mediating role of peer relationships (mediating effect value ab = −0.27, Z = −2.62, p = 0.01), while their effects on subjective well-being were through a direct path, the mediating role of peer relationships (mediating effect value ab = 0.12, Z = 2.60, p = 0.01), and the mediating role of teacher-student relationships (mediating effect value ab = 0.14, Z = 2.88, p = 0.003) in Table 3.

Discussion

The current study aimed to examined the association between PSEC and adolescent mental health, and the mediating effects of teacher-student relationship and peer relationship using a longitudinal design. The results showed that PSEC, subjective well-being, psychological distress, peer relationships, and teacher-student relationships were significantly correlated with each other. Longitudinal analysis found that PSEC at time 1 is significantly correlated with subjective well-being, psychological distress, peer relationships, and teacher-student relationships at time 2. The peer relationship was found playing a complete mediating role in the association between PSEC and psychological distress, while the effects of PSEC on subjective well-being were through a direct path, the mediating role of both peer relationships and teacher-student relationship. Therefore, the findings suggest that PSEC correlated with both psychological distress and subjective well-being, and the relationship with peer and teacher plays different roles in the pathway linked to PSEC and the mental health.

Table 3 The Mediating Effect of the Models

Model	Mediating Effect	*Z*	*p*
PSEC (T1) – CAPRQ (T2) – DASS (T2)	−0.27	−2.62	0.01
PSEC (T1) – CAPRQ (T2) – EPOCH (T2)	0.12	2.60	0.01
PSEC (T1) – TSRQ (T2) – EPOCH (T2)	0.14	2.88	0.003

Abbreviations: PSEC, perceived social-emotional competence; CAPRQ, peer relationship; DASS, psychological distress; EPOCH, subjective well-being; TSRQ, teacher-student relationship; T1, Time Point 1, T2, Time Point 2.

PSEC demonstrated a significant negative association with psychological distress measured at the second time point. The mediating analysis found that the effects of PSEC (T1) on psychological distress (T2) mainly occurred through the complete mediating role of peer relationships, underscoring the importance of peer relationships in mitigating psychological distress. The findings align with prior research which found higher level of perceived social-emotional competence was associated with decreased psychological distress.[15] PSEC is regarded as the perception of being capable in their social-emotional interactions,[10] which helps adolescents feel self-confident and optimistic in relation to build high-quality relationship with peers. Positive qualities of peer relationship are linked to lower levels of psychological distress.[31] However, the mediating effects of teacher-students relationship were not found. This may link to the findings reported that students' relationships with teachers typically weaken as students enter the higher grade, like students in the current sample. This may lead to reduction in the supportive role of teacher-students in mediating the effects of PSEC on psychological distress. Of course, more research still needed to further explore the role of teacher-student relationship in buffering against psychological distress.

Perceive SEC was found positively predicted adolescents' subjective well-being through the mediating roles of relationships with peers and teachers. This finding aligns with prior research which found that PSEC can significantly predict greater mental well-being,[12] but extends that work by showing the longitudinal effects of PSEC on subjective well-being and showing the mediating effects of relationships with peers and teachers. Adolescents' relationships with peers and teachers play protective roles in shaping their overall well-being.[16] Adolescents who perceive higher social acceptance and higher peer relationship tend to experience better well-being in adulthood.[32] It is possible this finding occurred because PSEC motivates individuals to build high-quality relationship with peers and teachers, then impacting adolescents' psychological well-being. Individuals who feel competent tend to engage in behaviors aligning with that perception,[32] that makes them more skilled at communication, conflict resolution, and offering support to classmates, which fosters a sense of connectedness within the peers and teachers and promotes adolescents' well-being.[33] In conclusion, these findings underscore the unique role of relationships with peers and teachers in mediating the association between PSEC and subjective well-being.

The differing influence paths of PSEC on psychological distress and subjective well-being can be attributed to several factors, including the role of PSEC in interpersonal relationships. Studies found that peer support was associated with various aspects of adolescent well-being, including context-free life satisfaction and affective subjective well-being, while teacher-student relationship is specifically linked to school satisfaction.[34] In addition, the influence of peer support on well-being has an equivalent impact of teacher and family support.[16] Although this study observed the association between teacher-student relationship and psychological distress, teacher-student relationship cannot mitigate the impact of bullying victimization on psychological distress as peer relationships.[35] These findings suggest the different role of peer relationship and teacher-student relationship in influencing adolescents' well-being and psychological distress.

Although this study provides insights into the interplay between PSEC and adolescent mental health as well as relationship with peers and teachers, there are some limitations. First, the sample focused on the late adolescent stage, and the influence of relationships with peers and teachers may vary across different stages of adolescence. Future research should further investigate this. Second, the sample was from only one province of China, so the findings may not be generalizable to other regions or cultural groups. Therefore, future studies should test the reproducibility of the current findings across different regions and cultures to increase validity.

Conclusion

The current study found that PSEC was associated with both psychological distress and subjective well-being. The effects of PSEC on psychological distress mainly occurred through the complete mediating role of peer relationships, while the effects of PSEC on subjective well-being were through the mediating role of peer relationships and teacher-student relationships. These findings enable a better understanding of specific mechanisms underlying PSEC and mental health.

Data Sharing Statement

The data presented in this study are available on request from the corresponding author. The data are not publicly available due to their confidential contents that could compromise the privacy of the research participants.

Institutional Review Board Statement

Ethical approval for this study was granted by the Research Ethics Committee of Shanghai Normal University. Written informed consent was obtained from all participants, and from a parent or legal guardian for minors.

Informed Consent Statement

Informed consent was obtained from all subjects involved in the study.

Acknowledgments

We thank all the participants in our experiments, without whom this research would not be possible. All individuals included in this section have consented to the acknowledgment.

Author Contributions

Investigation, Writing, Ping Zhou; Methodology, Conceptualization, Sidan Yan; Statistical analysis, Project administration, Lulu Hou. All authors made a significant contribution to the work reported, whether that is in the conception, study design, execution, acquisition of data, analysis and interpretation, or in all these areas; took part in drafting, revising or critically reviewing the article; gave final approval of the version to be published; have agreed on the journal to which the article has been submitted; and agree to be accountable for all aspects of the work.

Funding

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Disclosure

The authors declare no conflicts of interest in this work.

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