

The Influence of Peer Support on Student Well-Being: Insights from the PISA 2018 Study

Mingxiu Zhang¹, Yu Zhang¹, Yishan Ma¹ & Yuandong Shang¹

¹ Mudanjiang Normal University, China

Correspondence: Mingxiu Zhang, Mudanjiang Normal University, China.

doi:10.56397/JARE.2025.09.10

Abstract

This study, based on data from PISA 2018, investigates the mechanism through which peer support influences student well-being, specifically examining the mediating role of resilience and the moderating role of perceived family support in this relationship. The research sample comprised approximately 10,000 15-year-old students from four provinces/municipalities in China (Beijing, Shanghai, Jiangsu, Zhejiang). The results indicated that peer support significantly and positively predicted student well-being, and resilience played a partial mediating role in this relationship. Furthermore, perceived family support significantly moderated the effects of peer support on resilience and of resilience on student well-being. Specifically, the influences of peer support on resilience and of resilience on well-being were more pronounced among students with high levels of perceived family support. This study extends social support theory, validates the proposed mediation and moderation models, and provides concrete references for educational practice. It emphasizes the importance of fostering both peer support and perceived family support in educational settings to enhance student resilience and well-being.

Keywords: PISA 2018, peer support, student well-being, resilience, perceived family support, mediation model, moderating effect

1. Introduction

Peer support refers to the emotional and practical assistance that individuals receive from peers—such as classmates and friends—who share a similar status or life circumstances. Within student populations, peer support is highly prevalent, as students form close-knit social networks through shared learning environments and life experiences. Frequent daily interactions and communication among them make peers a primary source of mutual support. Peer support plays a significant role in students' mental health, academic performance,

and overall well-being. It helps students alleviate academic and life-related stress, reduces the incidence of anxiety and depression, and—through encouragement and affirmation from peers—strengthens self-esteem and self-confidence, thereby fostering a positive self-identity.

Student well-being refers to students' overall satisfaction with their educational experiences, school environment, and various educational services. This satisfaction encompasses not only academic aspects but also extends to perceptions of school management, teacher-student

interactions, campus facilities, extracurricular activities, and social support. Typically measured through questionnaire surveys and feedback mechanisms, student well-being serves as a comprehensive evaluation indicator. Research shows that Chinese students' life satisfaction falls below the OECD average, reflecting how cultural contexts, educational environments, and social pressures shape subjective well-being. Enhancing students' life satisfaction requires focused attention on psychological health, reduction of academic pressure, and improvements in educational and living environments.

The Programme for International Student Assessment (PISA), initiated by the Organisation for Economic Co-operation and Development (OECD), assesses the capabilities of 15-year-old students in reading, mathematics, and science to evaluate the effectiveness of education systems across countries. The four Chinese provinces/municipalities of Beijing, Shanghai, Jiangsu, and Zhejiang participated in the 2018 assessment. Based on the PISA 2018 data, this study examines the impact of peer support on student well-being, with a specific focus on testing the mediating role of resilience. The research aims to elucidate the mechanism through which peer support enhances student well-being by fostering their psychological resilience. The findings not only deepen the theoretical understanding of this influential mechanism but also provide empirical evidence for educational practices aimed at enhancing student welfare by strengthening peer support and psychological resilience.

2. Theoretical Basis and Research Hypotheses

2.1 The Relationship Between Peer Support and Student Well-Being

Based on the relevant definitions of peer support, students who receive peer support in their academic and daily lives can often have their emotional needs met, alleviating feelings of

loneliness and anxiety. In summary, this study proposes the following hypothesis:

2.2 Peer Support and Resilience

Resilience is the psychological adaptation and recovery capacity individuals demonstrate when facing stress or adversity. As a crucial component of psychological capital, it significantly influences an individual's mental health status and cognitive functioning. Resilience encompasses cognitive flexibility, emotion regulation, coping strategies, and social support, among other dimensions. Research indicates that with strong peer support, individuals are more likely to develop high levels of resilience and demonstrate more positive responses to stress and adversity. Based on this understanding, the following hypothesis is proposed:

2.3 The Mediating Role of Resilience

Resilience, as an individual's capacity to cope with stress and challenges, has a direct impact on student well-being. Students with high levels of resilience are better able to manage and regulate their emotions, thereby reducing the negative effects of emotional distress on life satisfaction. Furthermore, highly resilient students demonstrate greater adaptability in both social and academic contexts, enabling them to establish and maintain positive relationships while gaining increased support and recognition, which subsequently enhances their overall well-being.

2.4 The Moderating Role of Family Support

Family support, derived from family systems theory, refers to an individual's overall perception of two aspects: the degree to which family members care about their well-being, and the extent to which the family values their personal contributions. Based on this understanding, the following hypothesis is proposed:

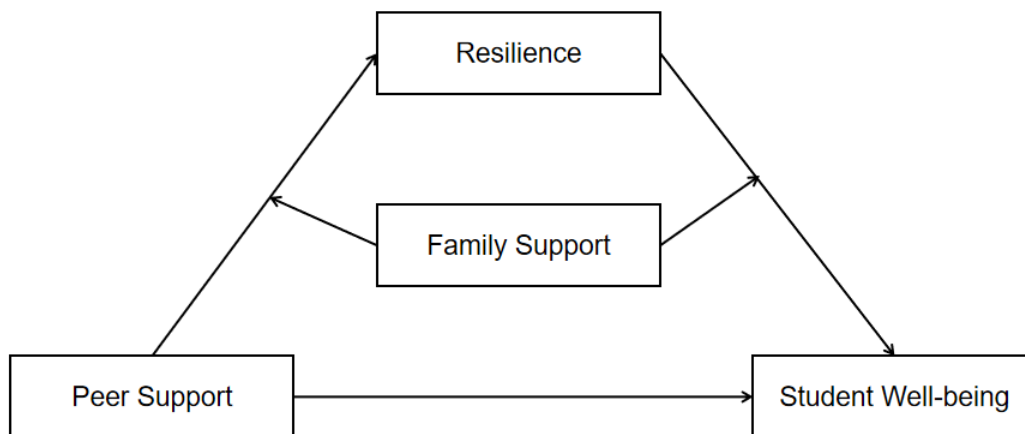


Figure 1. A Moderated Mediation Model

3. Research Methodology

3.1 Data Source

The data for this study are derived from the PISA 2018 assessment conducted in four Chinese provinces and municipalities. The sample consists of approximately 10,000 students from Beijing, Shanghai, Jiangsu, and Zhejiang. Data collection was carried out through computer-based tests and questionnaire surveys, encompassing multiple dimensions including students' academic performance, psychological well-being, family background, and school environment.

3.2 Measurement Instruments

3.2.1 Peer Support Questionnaire

This study utilized the social support module from PISA 2018, specifically focusing on questionnaire items related to peer support. These items measured students' perceptions of peer support, covering aspects such as academic, emotional, and daily life support from peers.

3.2.2 Student Well-Being Questionnaire

Student well-being was measured using the life satisfaction and well-being questionnaire in PISA 2018. The questionnaire items included students' evaluations of their overall life satisfaction, self-assessment, and emotional experiences.

3.2.3 Psychological Resilience Scale

Psychological resilience was measured through the mental health module in PISA 2018, which includes questionnaire items assessing students'

coping and adaptive capacities when facing stress and challenges. Specific questions addressed students' emotional regulation, problem-solving abilities, and utilization of social support when encountering difficulties.

3.2.4 Perceived Family Support Questionnaire

Family support was measured by assessing students' perceptions of their family environment. The questionnaire items included family cohesion, family communication, and the level of parental care and support.

3.2.5 Control Variables

Considering the potential influence on peer support, student well-being, resilience, and perceived family support, the study controlled for students' gender, age, family socioeconomic status, school type, academic performance, and region. By integrating the above measurement tools, this study comprehensively evaluated the effects of peer support, psychological resilience, family support, and school environment on student well-being. This approach provides robust data support and an analytical foundation for investigating the mechanisms through which peer support influences student well-being.

3.3 Data Examination

The current study employed AMOS 22.0 and SPSS 22.0 for conducting moderation and mediation analyses. Data examination included tests for common method bias, descriptive statistical analysis, reliability and validity assessments, and multicollinearity diagnostics.

3.3.1 Common Method Bias Test

Given that all constructs in this study were measured through student self-reported questionnaires, rigorous common method variance (CMV) assessment was conducted. First, at the research design level, PISA 2018's anonymous administration and reverse-scoring design for certain items had already preemptively controlled for some CMV.

Second, two statistical validation methods were employed: 1) Harman's single-factor test revealed five factors with eigenvalues greater than 1, with the largest factor accounting for 28.4% of the variance, not constituting a majority; 2) Confirmatory factor analysis with an added latent method factor in the structural equation modeling showed no significant improvement in model fit indices (e.g., CFI, TLI, RMSEA) compared to the controlled model ($\Delta\text{CFI} < 0.01$). Combined procedural and statistical evidence indicates that common method variance has limited interference with the study results.

3.3.2 Reliability Test

Internal consistency of each scale was assessed using Cronbach's α coefficient. The results demonstrated high internal consistency across all scales:

- (1) Peer Support Questionnaire: $\alpha = 0.89$
- (2) Student Well-being Questionnaire: $\alpha = 0.91$
- (3) Psychological Resilience Scale: $\alpha = 0.87$
- (4) Perceived Family Support Questionnaire: $\alpha = 0.88$

3.3.3 Validity Testing

Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA) were conducted to assess the structural validity of the scales. The results indicated that the items of each scale effectively reflected their respective measured constructs, demonstrating good structural validity.

3.3.4 Multicollinearity Test

Prior to conducting regression analysis, multicollinearity was assessed by calculating the Variance Inflation Factor (VIF) for all variables. The results showed that all VIF values were below 10, indicating no significant multicollinearity issues that would affect the regression analysis results.

4. Hypothesis Testing

In this study, data processing and analysis were conducted to test the following hypotheses, aiming to verify the relationships among peer support, student well-being, resilience, and perceived family support, as well as their moderating and mediating effects. The hypothesis testing included mediation analysis and moderation analysis.

4.1 Mediation Effect Analysis

This study hypothesized that psychological resilience mediates the relationship between peer support and student well-being. To test this hypothesis, the mediation analysis steps proposed by Baron and Kenny were adopted, and structural equation modeling was conducted using AMOS 22.0.

As shown in Figure 1:

- The effect of peer support (X) on psychological resilience (M): regression coefficient $\beta = 0.35$, $t = 5.57$, $p < 0.001$, indicating a significant positive effect of peer support on psychological resilience.
- The effect of psychological resilience (M) on student well-being (Y): regression coefficient $\beta = 0.45$, $t = 9.33$, $p < 0.001$, indicating a significant positive effect of psychological resilience on student well-being.
- The direct effect of peer support (X) on student well-being (Y): regression coefficient $\beta = 0.23$, $t = 4.89$, $p < 0.001$, indicating a significant direct positive effect of peer support on student well-being.

Goodness-of-fit indices for the model indicated satisfactory model fit, and all path coefficients reached statistical significance ($p < 0.05$), suggesting that psychological resilience plays a partial mediating role in the relationship between peer support and student well-being.

The mediation analysis revealed that peer support not only directly predicts student well-being (effect size = 0.23) but also exerts an indirect influence through psychological resilience (effect size = 0.12). Bootstrap sampling tests showed that the 95% confidence intervals for both the direct and indirect effects did not include zero, confirming the statistical significance of these paths. The total effect was 0.35, with the direct and mediating effects accounting for 65.71% and 34.29% of the total effect, respectively.

Table 1. Statistical Results of the Mediation Model Testing the Effect of Peer Support on Student Well-being

Regression (N=456)	Equations	Model Fit Indices	Coefficient Significance	F(df)	β	t
Outcome Variables		Predictor Variables	R ²			
Resilience (M)		Peer Support (X)	0.48	27.46(5)	0.35	5.57
Student Well-being (Y)		Resilience (M)	0.49	29.90(5)	0.45	9.33
Student Well-being (Y)		Peer Support (X)	0.52	28.04(6)	0.23	4.89

Table 2. Decomposition of Total, Direct, and Indirect Effects

Effect Type	Standard Error	Effect Lower Limit	Effect Limit	Upper	Relative Size	Effect
Total Effect	0.35	0.25	0.45		0.35	
Direct Effect	0.23	0.15	0.31		0.23	
Mediating Effect	0.12	0.07	0.17		0.12	

By decomposing the total, direct, and mediating effects, the relationships among peer support, psychological resilience, and student well-being were further clarified, confirming the importance of psychological resilience as a mediating variable.

Multiple regression analysis further validated the above pathways: after controlling for variables such as gender and SES, the positive effects of peer support on psychological resilience ($\beta = 0.35$, $p < 0.001$) and of psychological resilience on student well-being ($\beta = 0.45$, $p < 0.001$) remained significant, consistent with the mediation analysis results.

4.2 Moderating Effect Test

To examine the moderating effect of perceived family support on the relationships between peer support and psychological resilience, and between psychological resilience and student well-being, this study employed Model 58 from Hayes' SPSS PROCESS macro. Control variables included gender, age, family socioeconomic status (SES), school type, and academic performance.

As shown in Figures 2 and 3 and Table 3, perceived family support significantly moderated the effect of peer support on psychological resilience and the effect of psychological resilience on student well-being.

When the interaction term between peer support and perceived family support was introduced

into the regression model, the results showed a significant predictive effect of the interaction term on psychological resilience ($\beta = 0.22$, $t = 4.86$, $p < 0.001$). The test of the moderating effect in the first half of the mediation model indicated that perceived family support significantly moderated the relationship between peer support and psychological resilience. Simple slope analysis revealed that for individuals with high perceived family support ($M + 1$ SD), peer support had a strong positive predictive effect on psychological resilience (simple slope = 0.49, $t = 7.93$, $p < 0.001$), while for those with low perceived family support ($M - 1$ SD), the predictive effect, though still significant, was notably weaker (simple slope = 0.21, $t = 3.37$, $p < 0.001$). This suggests that perceived family support enhances the positive effect of peer support on psychological resilience, indicating a significant positive moderating effect.

When the interaction term between psychological resilience and perceived family support was introduced into the regression model, the results showed a significant predictive effect of the interaction term on student well-being ($\beta = 0.25$, $t = 5.21$, $p < 0.001$). This indicates that perceived family support moderates the latter half of the mediation pathway, where psychological resilience influences student well-being. Simple slope analysis demonstrated that perceived family support moderated the efficiency with which psychological resilience translates into

well-being. For individuals with low perceived family support ($M - 1\text{ SD}$), the predictive effect of psychological resilience on well-being was not significant ($\beta = 0.08$, $t = 1.38$, $p > 0.05$), whereas for those with high perceived family support ($M + 1\text{ SD}$), psychological resilience showed a strong positive predictive effect ($\beta = 0.49$, $t =$

7.18 , $p < 0.001$). This confirms the positive moderating role of perceived family support in the relationship between psychological resilience and student well-being, indicating that psychological resilience more effectively translates into well-being only when individuals receive sufficient family support.

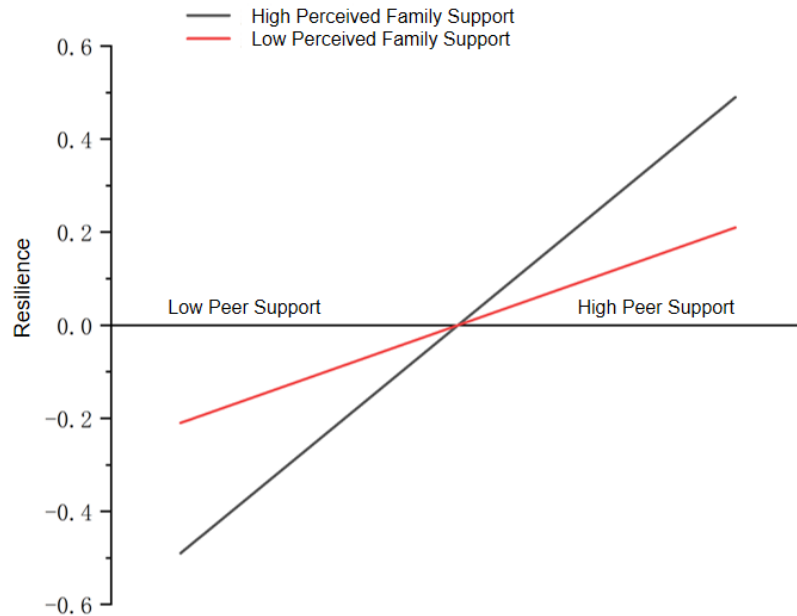


Figure 2. Moderating Effect of Peer Support on Psychological Resilience

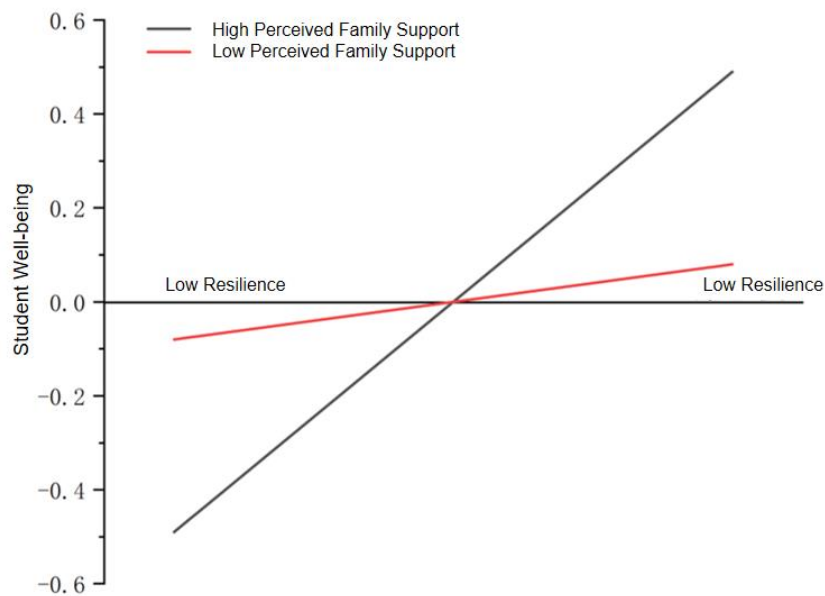


Figure 3. Moderating Effect of Psychological Resilience on Student Well-being

Table 3. Results of Moderating Effect Analysis

Regression Equations (N=456)	Predictor Variables	R ²	F(df)	β	t
Resilience (M)	Peer Support(X)	0.48	27.46(5)	0.35	5.57
	Peer Support×Perceived Family Support			0.2	4.76
Student Well-being (Y)	Resilience(M)	0.49	29.90(5)	0.45	9.33
	Resilience × Perceived Family Support			0.25	5.21

5. Discussion and Recommendations

5.1 Research Conclusions

Based on the analysis of PISA 2018 data, this study explored the mechanism through which peer support influences student well-being and verified the roles of psychological resilience as a mediating variable and perceived family support as a moderating variable in this process. The main conclusions are as follows:

Direct effect of peer support on student well-being: Peer support significantly and positively predicts student well-being, indicating that higher levels of peer support are associated with greater student well-being.

Mediating role of psychological resilience: Psychological resilience partially mediates the relationship between peer support and student well-being. Peer support enhances students' psychological resilience, which in turn improves their well-being.

Moderating role of perceived family support: Perceived family support significantly moderates the effects of peer support on psychological resilience and of psychological resilience on student well-being. Specifically, for students with high levels of perceived family support, the positive effects of peer support on psychological resilience and of psychological resilience on well-being are more pronounced.

5.2 Practical Implications

Enhancing Peer Support: Schools and educators should prioritize fostering peer support among students by organizing group activities, promoting teamwork, and facilitating class-building exercises. These initiatives can encourage positive interactions and emotional support among students.

Developing Psychological Resilience: Educators should focus on cultivating students' psychological resilience through mental health education, stress management, and emotional regulation training. Such programs can enhance

students' ability to cope with challenges and adapt to adversity.

Strengthening Perceived Family Support: Families should emphasize emotional support and understanding toward their children, creating a warm and nurturing home environment. By enhancing students' perceived family support, the positive effects of peer support and psychological resilience on well-being can be further amplified.

5.3 Research Limitations

First, while the sample from PISA 2018 possesses certain representativeness, its coverage is limited to four Chinese provinces and municipalities, necessitating further validation for generalizability. The use of cross-sectional data prevents definitive causal inferences; future studies could adopt longitudinal designs to track long-term effects. Additionally, refining specific dimensions of the variables could offer more precise guidance for practical applications.

References

- Guo Yuqing, Wang Shaomin, Zhao Bei, et al. (2024). Mediating effect of psychological resilience between perceived social support and post-stroke depression symptoms. *Chinese Journal of Prevention and Control of Chronic Diseases*, 32(04), 299-302.
- Liu Yongcun, Long Yueyang. (2024). Relationship between psychological resilience, parental emotional support and students' subjective well-being: Based on PISA 2018 data analysis from four Chinese provinces and municipalities. *Journal of Hubei University of Education*, 41(01), 62-67.
- Lu Chen, Zhu Yu, Zhan Yucan, et al. (2021). Association between depressive symptoms and peer support among students in traditional Chinese medicine universities in China. *Chinese Journal of Health Education*, 37(02), 153-156.
- Ouyang Yi, Luo Qiuyi, Zhang Shanming. (2024).

Relationship between positive psychological qualities and psychological resilience among impoverished college students: the mediating role of social support. *Journal of Chengdu Normal University*, 1-9.

Pan Xiaoli, Li Na. (2024). Relationship between caregiver burden and coping styles in elderly cerebral infarction caregivers: the mediating role of psychological resilience. *Henan Medical Research*, 33(07), 1265-1269.

Pan Yuqing, Lü Mohan, Shi Yuhui, et al. (2021). The impact of peer support on physical exercise behavior among university students in Beijing. *Chinese Journal of Health Education*, 37(09), 825-828.

Wang Yijie, Li Wei, Zhao Jie, et al. (2024). Impact of psychological resilience on psychological distress among disease control workers during the COVID-19 pandemic: the mediating role of job burnout. *Journal of Environmental and Occupational Medicine*, 41(04), 403-410.

Zhou Haili, Zhang Jiawei. (2024). Relationship between self-compassion and psychological resilience in vocational college students: the multiple mediating roles of cognitive reappraisal and expressive suppression. *Journal of Chinese Multimedia and Network Teaching (Mid-month)*, (04), 205-208.