

Psychological capital and positive academic emotions as mediators between school connectedness and academic engagement

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Abstract: This study utilized a mediation model to examine the role of psychological capital and positive academic emotions in the relationship between school connectedness and academic engagement in adolescents. A sample of 389 Chinese adolescents ($M_{age} = 13.43$; 51.2% females) completed the Utrecht Work Engagement Scale-Student (UWES-S), the Achievement Emotions Questionnaire (AEQ), the Positive Psychological Capital Scale (PPCS), and the School Connectedness Scale (SCS). Structural equation modeling analysis yielded findings to suggest that higher school connectedness is associated with academic engagement. Psychological capital was associated with positive emotions, and higher psychological capital partially mediated the relationship between school connectedness and academic engagement. These results are consistent with the Ecological systems theory proposing that the interplay between individual characteristics (e.g., psychological capital and positive academic emotions) and contextual factors (e.g., school connectedness) in shaping developmental outcomes, such as academic engagement. On the basis of these findings, promoting academic engagement among adolescents would require student development supports including fostering a positive school climate, enhancing psychological capital through resilience-building programs, and encouraging positive emotional experiences in academic settings.

Keywords: school connectedness; psychological capital; positive academic emotions; academic engagement

Introduction

Their school lives, students rely on the psychological capital as resources for school engagement. Psychological capital includes self-efficacy, optimism, hope, and resilience (Luthans et al., 2007). Academic engagement refers to the combined physical and mental effort that students dedicate to their studies (Astin, 1984). Students with academic engagement likely have positive emotions about being in school (Saleem et al., 2022). They would feel a sense of social connectedness. But, psychological capital is a complex variable and its interplay with school belongingness may explain student's affect or emotions towards their school life. When students have academic engagement, a significant predictor of students' motivation and performance, has been extensively studied by researchers (Chaudhry et al., 2024; Liu, 2024). However, the role of psychological capital and positive academic emotions in the relationship between school connectedness and academic engagement of adolescent students is less established, particularly as this is a volatile developmental stage characterized by emotional swings from self-exploration for identity development.

School connectedness and academic engagement

School connectedness plays a key role in promoting academic engagement. School connectedness encompasses teacher and peer support and feelings of belonging. Based on ecosystem theory, the school is a core “micro-system”

that shapes students' learning and development (Brown & Vickers, 2004). As adolescents spend more time at school and less with family, the school environment becomes a major influence on their behavior (Bao et al., 2015). Studies have consistently linked school connectedness with academic engagement (McKellar & Wang, 2023; Romano et al., 2021; Sadoughi & Hejazi, 2023). For instance, Romano et al. (2021), showed that perceived higher teacher support is associated with greater engagement, illustrating the vital role of school connectedness in academic outcomes.

Psychological capital and academic engagement

Psychological capital is one of the most frequently studied factors influencing academic engagement (Paloş et al., 2023). It is defined as a positive psychological state of development characterized by four components: self-efficacy, optimism, resilience, and hope (Luthans et al., 2015). Self-efficacy refers to the confidence in accepting and striving to accomplish challenging tasks. Optimism reflects a positive outlook on current or future success. Resilience involves maintaining tenacity and the ability to bounce back from difficulties and setbacks to achieve goals. Hope is defined as persevering toward a goal and adjusting strategies when necessary to achieve it (Carmona-Halty et al., 2021; Finch et al., 2020). Wang (2021) showed that higher psychological capital leads to higher academic engagement in college students. These studies

suggest that psychological capital is an important factor influencing academic engagement. However, the role of psychological capital in adolescents academic engagement warrants further investigation.

Positive emotions and academic engagement

Positive emotions would promote to academic engagement. According to Ecosystem theory, positive emotions are from the results of supportive interactions within immediate and extended environments, such as interactions with family, peers, and teachers. For instance, adolescents who reported positive interactions with their teachers experienced emotions like joy, interest, and pride, which contributed to their motivation to engage more deeply in their studies (An et al., 2023). Zhang et al. (2021) stated that students with positive academic emotions are more willing to put energy into their studies and achieve a higher level of engagement. In summary, these findings suggest that positive academic emotions may be one of the factors of affecting academic engagement.

School connectedness, psychological capital, and positive academic emotions

Previous studies have demonstrated that school connectedness, psychological capital, and positive academic emotions are important predictors of academic engagement in college students (Gebregergis et al., 2023). In junior high students, stronger school connectedness tends to enhance psychological capital, which, in turn, boosts positive academic emotions (Slåtten et al., 2021; Yong et al., 2020). Yu et al. (2023) found that school climate, which is a social connectedness variable is associated with psychological capital, and presumably through school connectedness. Alivernini et al. (2019) showed that students having close relationships with even a few classmates reported positive academic emotions (see also Lei et al., 2017). Psychological capital may provide the psychological resilience for greater positive academic emotions (Slåtten et al., 2021; Wang et al., 2017), for school engagement. Few studies have examined how these factors work together to impact academic engagement.

Goal of the Study

This study aims to test a mediation model to examine the role of psychological capital and positive academic emotions in the relationship between school connectedness and academic engagement. Our hypotheses are as follows:

H1. School connectedness directly predicts higher academic engagement.

H2. Psychological capital mediates the relationship between school connectedness and academic engagement for higher school engagement.

H3. Positive academic emotions mediate the relationship between school connectedness and academic engagement for higher school engagement.

H4. School connectedness indirectly predicts academic engagement through psychological capital and positive academic emotions to be higher.

Method

Participants and setting

The participants were 389 students (51.2% were female and 48.8% were male) in grades seventh to ninth in Fujian, China. The age ranged from 12 to 16 years ($M = 13.43$, $SD = 0.68$). Of all students, 23.4% were in the seventh grade, 37.0% in the eighth grade, and 39.6% in the ninth grade.

Measures

School connectedness

The School Connectedness Scale (SCS), which was developed by Yu et al. (2011) to determine the degree to which middle school students perceived themselves to be supported by teachers and classmates and school belonging (Yu et al., 2011). Here, students are asked to describe their affective relationship with teachers (e.g., “My teacher was very caring and supportive”), classmates (e.g., “I can count on my classmates when I get into trouble”), and school (e.g., “I think I am very happy to be a part of the school”). All items were rated using a five-point scale ranging from 1 (“strongly disagree”) to 5 (“strongly agree”). The responses were the total value of 10 items, with higher scores indicating a higher school connectedness. The internal reliability for SCS scores in this study was 0.81.

Psychological capital

To measure psychological capital, we used the Positive Psychological Capital Scale (PPCS) created by Luthans (2005) (Luthans et al., 2005). This scale consists of 26 items, includes four dimensions: Efficacy (e.g., “I always do a good job”), Optimism (e.g., “I actively study and work to realize my ideal”), Hope (e.g., “I feel hopeful about the future”), Resilience (e.g., “I bounce back quickly when I encounter setbacks”). All items were scored from 1 (“completely disagree”) to 7 (“completely agree”). The responses were the total value of 26 items, with higher scores indicating more positive psychological capital. The internal reliability for PPCS scores in this study was adequate ($\alpha = 0.92$).

Academic emotions

The participants completed 8 items the Achievement Emotions Questionnaire (AEQ) (Pekrun et al., 2011). The scale assesses students’ academic emotions, which is divided into two dimensions: positive and negative. The sample items for the two dimensions are as follows: “I like to acquire new knowledge” and “I feel angry when I’m studying.” The scale contains 8 items rated on a five-point scale from 1 (“completely disagree”) to 5 (“completely agree”). In our study, we used the all items in positive academic emotions subscales. In the current study, scores from the AEQ yielded a good internal reliability ($\alpha = 0.72$).

Academic engagement

Students’ academic engagement was assessed using revised the version of the Utrecht Work Engagement Scale-Student (UWES-S) (Schaufeli et al., 2002). This tool has 17 items, rated on a five-point scale from 1 (“completely disagree”) to 5 (“completely agree”). The scale is

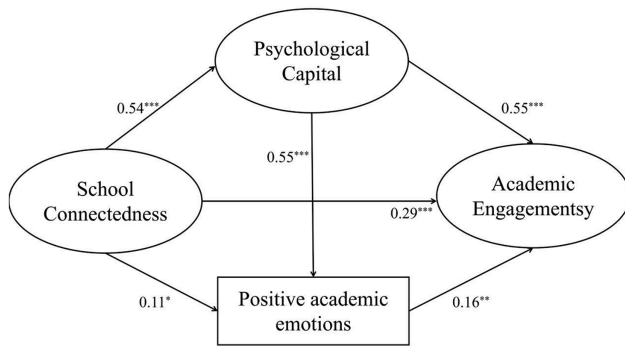


Figure 1. Multiple structural model. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

divided into three dimensions: vigor (6 items), dedication (5 items), and absorption (6 items). Items include: “I like to study as soon as I get up in the morning,” “I am passionate about learning,” and “I was immersed in study.” In this study, the UWES-S scores yielded a strong internal reliability ($\alpha = 0.94$).

Procedure

The research proposal was approved by the Ethics Committee of Fujian Polytechnic Normal University. The school principals granted study permission. The parents or guardians of the students provided content for their charges to participate in this study. All students assented to the study. The students completed the surveys during normal class time.

Data analysis

SPSS21.0 was used for descriptive statistics, reliability analysis and correlation analysis. On this basis, AMOS17.0 was used to construct the structural equation model (SEM). With school connectedness and academic engagement as independent and dependent variables, and psychological capital and positive academic emotions as mediating variables, the relationship between these variables was modeled. To evaluate model fit, CFI, TLI, RMSEA and SRMR were measured. We used $CFI > 0.90$, $RMSEA$ and $SRMR < 0.08$, and $\chi^2/df < 5$ as the minimum acceptable levels for model fitting (Schreiber et al. 2006).

In order to control the measurement error effectively, SEM was used to detect multiple mediating effects. School connectedness, psychological capital, and academic engagement are potential variables. With school connectedness and academic engagement as independent and dependent variables, and psychological capital and positive academic emotions as mediating variables, the relationship between these variables was modeled. As shown in Figure 1, the model fitting results are as follows: $\chi^2/df = 3.08$, $CFI = 0.96$, $RMSEA = 0.07$, $AGFI = 0.91$, $GFI = 0.95$, $IFI = 0.96$, $TLI = 0.95$, $SRMR = 0.04$. The results show that the fitting index of the model is ideal. This indicates that the fitting degree of the data and the built model is relatively consistent, and the hypothesis model is acceptable. On this basis, Bootstrap test was used to extract 5000 samples, and 95% CI was set to estimate and test the effectiveness of the mediation effect.

Results

Descriptive statistics and correlation analysis

Table 1 provides descriptive statistics and Pearson correlation analysis information between school connectedness, psychological capital, positive academic emotions, and academic engagement. The results of correlation analysis show that academic engagement is correlated with school connectedness, psychological capital and positive academic emotions. All dimensions of school connectedness and psychological capital are positively correlated with academic engagement.

School connectedness and academic engagement

As in Table 2, path analysis showed the total effect of school connectedness on academic engagement was 0.66, ($p < 0.001$, 95% $CI = 0.563-0.756$). The direct effect of school connectedness on academic engagement accounted for 43.94% of the total effect. These findings fully support Hypothesis 1, confirming that school connectedness has a significant and direct influence on middle school students’ academic engagement.

Mediation analyses

Psychological capital and positive academic emotions play an indirect role in school connectedness and academic engagement. The pathway of “School Connectedness \rightarrow psychological capital \rightarrow positive academic emotions \rightarrow academic engagement” was significant, suggesting that the higher school connectedness, the higher the level of psychological capital, the more positive academic emotions and academic engagement, support H2 and H3. Therefore, psychological capital and positive academic emotions play only partial mediating roles in the effect of school connectedness on academic engagement. The total mediating effect was 0.37, accounting for 56.06% of the total effect, support H4.

Discussion

This study’s results indicated that (1) School connectedness directly predicts academic engagement; (2) Psychological capital mediates the relationship between school connectedness and academic engagement; (3) Positive academic emotions also serve as a mediator; and (4) School connectedness influences academic engagement indirectly through psychological capital and positive academic emotions.

A strong connection to school provides a secure environment, motivating students to participate in academic activities. This strengthens their academic self-efficacy and increases their academic engagement. When students feel supported by teachers and peers, they develop a strong sense of belonging and attachment to the school (Allen et al., 2023; Bakchich et al., 2022). This attachment promotes greater participation in school-related activities, including academic engagement. In contrast, when students lack a sense of belonging, they are more likely to experience negative emotions towards school, reducing their academic engagement even when they see academic success as important.

Table 1. Descriptive statistics and correlation analysis

	M ± SD	1	2	3	4
1 School connectedness	34.01 ± 5.00	—			
2 Psychological capital	120.45 ± 21.57	0.43**	—		
3 Positive academic emotions	11.33 ± 2.15	0.36**	0.56**	—	
4 Academic engagement	56.94 ± 11.30	0.50**	0.58**	0.70**	—
5 Classmates support			0.20**	0.19**	0.24**
6 Teachers support			0.26**	0.27**	0.29**
7 School belonging			0.37**	0.52**	0.59**
8 Efficacy		0.30**		0.50**	0.59**
9 Optimism		0.44**		0.56**	0.61**
10 Hope		0.42**		0.61**	0.68**
11 Resilience		0.28**		0.46**	0.37**

Note. ** $p < 0.01$.

Table 2. Bootstrap analyses of the magnitude and statistical significance of indirect effects

	B	SE	Boot LLCI	Boot ULCI
Total indirect effect	0.05	0.02**	0.015	0.084
Indirect effect of psychological capital	0.30	0.04***	0.218	0.389
Indirect effect of positive academic emotions	0.02	0.01*	0.001	0.045
Direct effect	0.29	0.06***	0.187	0.402

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

School connectedness affects academic engagement through psychological capital. Strong school connectedness satisfies relational and competency needs, promoting positive psychological resources in left-behind individuals, which, in turn, boosts academic engagement (Faraone, et al., 2006). On the other hand, weak school connectedness depletes these resources, reducing motivation, interest, and engagement in learning. Prior research confirms that adolescents with higher levels of school connectedness report more positive self-perceptions and increased academic engagement (Zeinalipour, 2022; Huang & Wang, 2023).

The stronger the perceived school connectedness of junior middle school students, the more helpful it is to improve their positive academic emotions and reduce their negative academic emotions. Positive academic emotion can promote students' autonomous learning, enable students to flexibly plan, monitor and evaluate their own learning (Ms & Syh, 2021). Improve students' judgment of learning behavior and ability, so as to enhance students' academic engagement.

According to Ecosystem theory (Brown & Vickers, 2004), school connectedness, psychological capital, and positive academic emotions play a role in students' academic engagement. In this relationship, psychological capital is affected by school connectedness. The more positive psychological potential middle school students possess, the more positive emotions they experience in learning, and the less negative emotions they experience (Wang et al., 2017). Positive academic emotions is more conducive to students' in-depth exploration of knowledge, cognitive activities and the formation of an active learning attitude, thus forming a virtuous cycle, the higher the academic engagement (Slåtten et al., 2021). Overall, psychological capital and positive academic emotions have

multiple mediating effects on the relationship between school connectedness and academic engagement. Psychological capital not only increases academic engagement by improving school connectivity, but also indirectly increase academic engagement by improving students' psychological capital and positive academic emotions. This would help advance our understanding and insight into factors related to middle school students' academic engagement.

Implications for Research and Practice

This study offers significant contributions to the current body of research. First, it demonstrates that the mediation of the relationship between school connectedness and academic engagement by psychological capital and positive academic emotions. By identifying psychological capital and positive academic emotions as mediators between school quality of life and academic engagement, the findings offer valuable insights the central role of student personal and school assets for their school success. By implication, schools should work to build a supportive and positive school environment comprising strong relationships between teachers, students, and peers to promote a sense of belonging, which ultimately enhances academic performance.

Limitations and Suggestions for Further Research

There are some limitations to this study. First, its cross-sectional design, which makes it difficult to draw conclusions about causal relationships. Future studies using longitudinal designs could provide a clearer understanding of how school connectedness and academic engagement are related over time. Second, the study relied on self-reported data, which may introduce certain biases. In future research, more objective data sources, such as teacher evaluations, could be used. Third, the study did not

account for the influence of family environment regarding the student's school life. Future research could include family factors like the parent-child relationship to investigate their role in shaping academic engagement through psychological capital and positive emotions. Lastly, the study only included Chinese adolescents, so further studies should explore whether the findings generalize to other populations and age groups.

Conclusion

Psychological capital and positive academic emotions play a sequentially mediating role in the relationship between school connectedness and academic engagement. This study's results indicated that school connectedness directly predicts academic engagement. Furthermore, psychological capital and positive academic emotions act as mediators in this relationship, with school connectedness influencing academic engagement indirectly through the sequential mediating roles of these two factors. These findings emphasize the critical role of school connectedness in fostering students' psychological capital and positive academic emotions, ultimately enhancing their academic engagement.

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Availability of Data and Materials: The datasets generated and analyzed during the current study are available from the corresponding author on reasonable request.

Ethics Approval: All procedures performed in studies involving human participants were per the ethical standards of the institutional and with the 1964 Helsinki Declaration.

Conflicts of Interest: The authors declare no conflicts of interest to report regarding the present study.

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