

Original article

The Impact of Positive and Negative Life Events on Learning Engagement Among Chinese College Students: The Mediating Role of Self-Control

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Abstract: Insufficient learning engagement is a common issue among Chinese college students. Previous studies have indicated that specific life events influenced their level of learning engagement. However, few studies have specifically investigated the overall impact of positive and negative life events on the learning engagement of college students. This study aims to explore the mechanisms through which positive and negative life events affect learning engagement among Chinese college students. Using cross-sectional research, 1581 college students from in Chongqing were selected to complete the Adolescent Daily Life Events Scale, the Brief Self-Control Scale, and the Learning Engagement Questionnaire. Descriptive statistics and correlation analysis were conducted using SPSS 21.0, and mediation analysis was tested using Model 4 in the PROCESS 3.0 plugin. The study revealed that: (1) Negative life events among college students had no significant correlation with learning engagement ($r = -0.005$, $p > 0.05$); (2) Positive life events among college students significantly and positively predicted learning engagement, with a direct effect of 0.571 (95%CI [0.491-0.656]); (3) Self-control among college students positively predicted their learning engagement, with a direct effect of 1.071 (95%CI [0.944-1.198]); (4) Self-control mediated the effect of positive life events on learning engagement, with an indirect effect of 0.103 (95%CI [0.062-0.146]). Negative life events among college students aren't significantly associated with their learning engagement, whereas positive life events positively predict learning engagement. Moreover, self-control plays a mediating role in the influence path of positive life events on learning engagement. This result can provide a reference for universities to formulate strategies for enhancing college students' learning engagement.

Keywords: Positive and Negative Life Events; Learning Engagement; Self-Control; Mediating Effect; Chinese College Students

1. Introduction

Learning engagement refers to a continuous and complete positive mental state that students experience during their learning process. It is characterized by vigor, dedication and focus, allowing learners to fully immerse themselves in learning activities and tasks (Schaufeli et al., 2002). In a state of high learning engagement, college students exhibit stronger motivation and greater learning efficiency, which contribute to better academic performance. Additionally, students with higher levels of learning engagement have more positive emotional experiences, higher satisfaction and identification with their school, better relationships with teachers and peers, and better physical and mental health conditions (He et al., 2021).

Of particular concern is a widespread phenomenon of insufficient learning engagement among Chinese college students, which directly affects their academic performance and leads to poor quality of higher education talent cultivation. Chinese researchers have studied various factors influencing college students' learning engagement, identifying that factors such as learning interest, self-efficacy, campus interpersonal interaction (teacher-student and peer relationships), campus environment, teaching management, extracurricular activities, and parenting styles as

significant predictors students' learning engagement (Li, 2023; Liu et al., 2025; Chen, 2022). These factors encompass various aspects of students' daily lives, including learning, leisure, and social interactions, and are closely related to the life events students experience. However, there are relatively few studies that investigate the mechanism of the impact of students' whole life events status on learning engagement. Therefore, it is necessary to study the impact of life events on students' learning engagement.

2. Relationship between life events and learning engagement among college students

Life events refer to the situations and events in daily life that are significant enough to cause changes in an individual's psychological and physiological stability, including both positive and negative events. These events require individuals to take adaptive measures and are major stressors influencing their physical and mental health (Zhang, 2021; Zhou & Liu, 2021). Previous studies have shown that life events impacted the physical and mental health of college students. Negative life events are positively correlated with college students' depression, suicidal ideation, and non-suicidal self-harm (Yao et al., 2019; Yao et al., 2023; Song et al., 2018), while negatively correlated with subjective well-being and mental health (Liu et al., 2019; Milica et al., 2021). In contrast, positive life events are positively correlated with college students' positive emotions (Zhang et al., 2019a) and school adaptation (Zhang et al., 2019b), negatively correlated with mental health problems, and can alleviate the negative impact of negative events on mental health (Yin et al., 2025). Currently, there are relatively few studies on the relationship between life events and learning engagement among college students, with most studies focusing on middle school students. The studies on the impact of life events and learning engagement among middle school students indicate that negative life events are positively correlated with students' academic burnout and academic procrastination (Qi et al., 2022; Zhang et al., 2023a), which reduces their level of learning engagement. Meanwhile positive life events are positively correlated with students' academic redefinition (Zhang et al., 2023b), experiencing positive life events enables middle school students to have positive academic emotions, allowing them to actively adjust and change their negative states when their academic performance is poor, thereby increasing their level of academic engagement (Chen, 2021). Compared to middle school students, college students' learning is characterized by greater autonomy and exploration (Yu, 2023), requiring them to maintain a strong state of learning engagement. Therefore, it is necessary to investigate the impact of life events on learning engagement among college students. Based on the results of studies on life and learning engagement in middle school students, we hypothesize:

H1 Positive life events positively predict college students' learning engagement.

H2 Negative life events negatively predict college students' learning engagement.

3. Mediating role of self-control

Self-control refers to an individual's ability to overcome or modify their dominant reaction tendencies, regulate their thoughts, emotions and behaviors, and achieve long-term and valuable goals (Fu et al., 2023). It is the key factor for human success and happiness, as well as a crucial promoter of academic development among college students (Wu et al., 2017). The limited resource model of self-control posits that self-control requires the consumption of an individual's limited self-control resources. Successful self-control behaviors rely on the availability of sufficient self-control resources. When previous behaviors deplete self-control resources to a certain extent, it can lead to failure in self-control on subsequent behaviors. The amount of available self-control resources determines whether self-control is successful, the more resources available, the more likely self-control will be successful, and vice versa (Baumeister et al., 2007).

Life events can impact an individual's self-control resources, either reducing or enhancing their self-control ability. On one hand, negative life events can put individuals in a state of stress, negative emotions, and low self-efficacy, etc. (Zhang et al., 2023a), which deplete self-control resources and consequently diminish their self-control ability. Especially, significant traumatic life events have a negative impact on self-control that persists even after the event has ended (Choung & Pak, 2023; Willems et al., 2024). On the other hand, positive life events bring individuals positive emotional experiences, improve their life satisfaction and enthusiasm (Zhang et al., 2019a). These positive states can enrich an individual's self-control resources, thereby enhancing their self-control ability.

Moreover, self-control positively predicts adolescents' learning behaviors. Individuals with high self-control can regulate themselves to maintain a positive learning engagement, leading to better academic performance. Moreover, self-control plays a mediating role in the relationships between adolescents' endogenous power for poverty, mobile phone addiction, psychological capital, academic procrastination and learning engagement (Xie et al., 2025; Gao et al., 2021; He et al., 2019; Chen et al., 2019; Li & Yang, 2017). Based on these findings, we hypothesize 3:

H3 Self-control mediates the relationship between life events and learning engagement among college students.

4. The present study

To summarize, although numerous studies have indicated that interpersonal interactions, teaching management, and other life events in college students' lives affect their learning engagement, there has been limited research investigating the impact of positive and negative life events on learning engagement. Therefore, this study aims to explore the impact of positive and negative life events on learning engagement among Chinese college students, as well as the mediating role of self-control. The results of this study will enhance the theoretical understanding of the relationship between life

events and learning engagement among college students, as well as provide references for developing educational strategies to improve college students' learning engagement.

5. Methodology

5.1 Participants and procedure

This study employed a convenience sampling method, selecting students from first to third year from three colleges in Chongqing to complete the questionnaire. Since fourth-year students were in the internship stage and were not on campus, they were not included in the survey. First, the research team contacted student counselors to inform them of the study content, obtain their support for the investigation, and schedule the survey's time and location. Second, the counselor organized the students to go to the classroom at the appointed time to complete the questionnaire. When the students arrived, the investigators first explained the content and purpose of the study, emphasizing anonymity and confidentiality. The students were then given an informed consent form, asking those willing to participate to sign the consent. Third, students who signed the informed consent form were distributed the survey questionnaires. Students completed the questionnaires on-site, and the completed questionnaires were uniformly collected in a timely manner. Fourth, the research team reviewed the completed questionnaires, eliminating invalid responses such as incomplete or randomly answered surveys, and entered valid responses into the database for analysis. This study was approved by the Ethics Committee of Chongqing University of Arts and Sciences (Approval Number: CQWLDF0030).

A total of 1700 questionnaires were distributed in this study, with 1581 valid responses were returned, resulting in an effective rate of 93%. Among the participants, 629 were male (39.8%) and 952 were female (60.2%); 716 participants were from liberal arts majors (45.3%) and 865 were from science majors (54.7%); 731 participants were in the first year (46.2%), 486 were in the second year (30.7%), and 364 were in the third year (23.0%); 542 participants were from urban areas (34.3%) and 1039 were from rural areas (65.7%). The average age of participants was (20.09 ± 6.88) years.

6. Materials

6.1 Adolescent Daily Life Events Scale

The Daily Life Events Scale (DLES, Zhang et al., 2019a; Chen, 2021) was used to assess the occurrence of life events and their impact on students. The scale consists of 22 items, including two subscales for positive and negative life events. It uses a 5-point Likert-type scale with anchors ranging from 1-5 represent "never occurred and no impact, some impact, medium impact, significant impact, and extremely significant impact" respectively. The higher the total scores of the positive and negative life events subscales are, the greater the frequency and impact of the positive and negative life events. The Cronbach's α value for the positive and negative life events subscale were 0.897 and 0.950 respectively.

6.2 Brief Self-Control Scale

The Brief Self-Control Scale (BSCS, Morean et al., 2012; adapted by Luo et al.) was used to measure self-control ability among college students. The scale comprises two dimensions: self-discipline and impulse control, with a total of 7 items. It utilizes a 5-point Likert scale with anchors ranging from 1-5 represents "strongly disagree, disagree, neutral, agree, and strongly agree" respectively. Items 4 to 7 are reverse-coded, and after reverse scoring, a higher total score indicates better self-control ability. The Cronbach's α value for this scale was 0.700.

6.3 Utrecht Work Engagement Scale-Student

The Utrecht Work Engagement Scale for Students (UWES-S, Schaufeli et al., 2002; adapted by Li et al., 2010), was used to measure college students' learning engagement. The scale includes three dimensions: motivation, energy, and concentration, with a total of 17 items. It utilizes a 5-point Likert scale with anchors ranging from 1-5 represents "strongly disagree, disagree, neutral, agree, strongly agree" respectively. A higher total score indicates a higher level of learning engagement. The Cronbach's α value for this scale was 0.961.

6.4 Statistical Analysis

Data analysis was conducted using SPSS 23.0. Descriptive statistics were employed to examine the basic conditions of college students' life events, self-control, and learning engagement. Correlation analysis was used to explore the relationships between variables. Regression analysis was performed to investigate the effects of life events and self-control on learning engagement. The mediation effect of self-control was tested using Model 4 in the PROCESS 3.0 macro.

7. Results

7.1 Common Method Bias Test

This study used multiple scales, which might introduce common method bias and affect the accuracy of the research results. Therefore, before conducting formal data analysis, we used Harman's single-factor method to test whether there was common method bias in this study. This method can accurately assess whether a single factor can

explain all observed variance. The test results showed that in the unrotated solution, 16 initial eigenvalues exceeded 1, and the variance explained by the first common factor was 23.78%, which was below the standard critical threshold of 40%, indicating that the data of this study did not exhibit substantial common method bias.

7.2 Descriptive Statistics and Correlation Analysis

As shown in Table 1, the results of the correlation analysis indicated that positive life events were significantly and positively correlated with both self-control and learning engagement ($P < 0.01$ for both). Negative life events were significantly and negatively correlated with self-control ($P < 0.01$), while were not significantly correlated with learning engagement ($P > 0.05$). Since negative life events were not significantly correlated with learning engagement, they do not meet the conditions for mediation effect testing.

Table 1 Descriptive statistics and correlation analysis

	<i>M</i>	<i>SD</i>	negative life events	positive life events	self-control	learning engagement
negative life events	33.06	13.179	1	-	-	-
positive life events	19.84	6.034	0.409**	1	-	-
self-control	22.49	3.931	-0.195**	0.148**	1	-
learning engagement	54.44	11.564	-0.005	0.353**	0.408**	1

Note: ** $p < 0.01$, *** $p < 0.01$, same below.

7.3 Testing for mediation effect

All variables were centered prior to analysis. The mediation effect of self-control was tested using Model 4 in the PROCESS 3.0 macro, with a non-parametric percentile bootstrap method applied for 5,000 resamples to calculate the 95% confidence interval.

As shown in Table 2 and Figure 1, the results of the mediation analysis indicated that the direct effect of positive life events on learning engagement was significant ($\beta = 0.574$, $P < 0.001$); the direct effect of self-control on learning engagement was significant ($\beta = 1.071$, $P < 0.001$); the direct effect of positive life events on self-control was significant ($\beta = 0.197$, $P < 0.001$). The indirect effect of positive life events on learning engagement through self-control was 0.103, with a 95% confidence interval (CI) of [0.062, 0.146], which does not include zero. This suggests that self-control partially mediates the relationship between positive life events and learning engagement. The total effect of positive life events on learning engagement was 0.677, with the mediation effect accounting for 15.21% of the total effect.

Table 2 Testing for mediation effect of self-control

path	direct effect	mediation effect	<i>t</i>	95%CI	<i>p</i>
positive life events → learning engagement	0.574	-	13.617	0.491~0.656	<0.001
positive life events → self-control	0.197	-	5.964	0.065~0.128	<0.001
self-control → learning engagement	1.071	-	16.562	0.944~1.198	<0.001
positive life events → self-control → learning engagement	-	0.103	-	0.062~0.146	-

Note: ** $p < 0.01$, *** $p < 0.01$, same below.

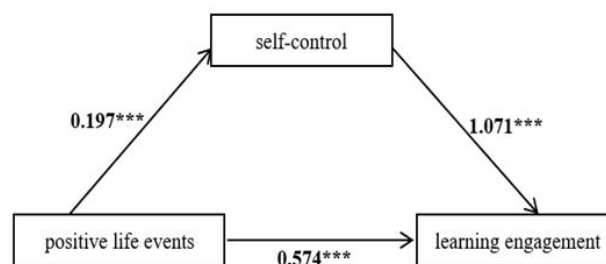


Figure 1. The path diagram

8. Discussion

8.1 The impact of life events on college students' learning engagement

The findings of this study reveal that positive life events significantly and positively predict college students' learning engagement. Specifically, the greater the impact of positive life events experienced by college students, the higher their level of learning engagement, thereby supporting Hypothesis 1. In contrast, negative life events show no significant correlation with learning engagement and thus are not identified as influencing factors, leading to the rejection of Hypothesis 2. This result is consistent with the findings of previous research on the relationship between positive and negative life events and adults' cognitive functioning as well as optimistic attitudes (Castanho et al., 2021; Schwaba et al., 2019).

8.1.1 The positive impact of positive life events on learning engagement

The results show that positive life events impact college students' learning engagement positively, and this may be attributed to the following reasons.

First, positive life events can elicit pleasurable emotional experiences, alleviating negative emotions such as anxiety and depression, thus placing individuals in a more positive mental state. In such an optimal emotional state, students are more likely to engage actively in their studies, adjust their learning strategies, and improve academic performance (Chen, 2021).

Second, positive life events can enhance students' overall school adaptation. This study examined positive life events in various domains of students' lives, including interpersonal relationships, academic pursuits, and daily activities. The more positive life events students experienced, the more positive emotions they encountered in social interactions, learning, and everyday life. This emotional boost fosters better adaptation to school life, allowing students to devote more energy to their academic endeavors (Zhang, 2019b).

Finally, positive life events contribute to improved students' overall mental health. On one hand, positive life events can enhance sleep quality, leading to greater energy and reduced stress, which in turn increases the likelihood of further positive events occurring (Sin et al., 2017). On the other hand, experiencing more positive life events correlates with fewer negative emotions (Li et al., 2017), helping students mitigate undesirable emotional and behavioral patterns such as academic burnout and procrastination (He et al., 2019).

Thus, positive life events can holistically improve students' mental health, placing them in an emotionally favorable state and facilitating better school adaptation. In this positive condition, students are more likely to engage proactively in their learning activities.

8.1.2 The Insignificant Relationship Between Negative Life Events and Learning Engagement

The results show that negative life events aren't significantly related to college students' learning engagement, thus are not influencing factors for learning. This is consistent with the findings of previous research on high school students (Chen, 2021). This suggests that learning is the primary task for college students during college years, and even when students experience negative life events in their daily lives, they can still focus on their studies.

These results underscore the importance of creating a positive living and learning environment for students. To enhance college students' learning engagement, universities should strive to foster a supportive atmosphere that promotes positive life events in students' lives, including their social interactions, daily experiences, and academic endeavors. By doing so, students are more likely to experience a greater number of positive events, which can in turn strengthen their learning engagement and overall well-being.

8.2 Mediating Effect of Self-Control in the Relationship Between Positive Life Events and Learning Engagement in College Students

The results of the mediation effect analysis reveal that self-control partially mediates the relationship between positive life events and learning engagement among college students. Positive life events not only have a direct positive impact on learning engagement but also by enhancing self-control levels, further increase learning engagement, thus partially confirming Hypothesis 3.

On one hand, positive life events can positively predict self-control among college students. Experiencing positive life events increases students' positive emotions, enhance life satisfaction and life motivation, all of which contribute to expanding their self-control resources (Baumeister, 2007) and improving their self-regulatory abilities. On the other hand, self-control positively predicts learning engagement (Liu et al., 2025). Students with stronger self-control are more likely to recognize the importance of their study, effectively plan and execute study schedules, resist distractions, and remain focused on current learning tasks. All of these can enhance their learning engagement levels (Liu et al., 2025; Chen et al., 2019; Li et al., 2017).

8.3 Implications of the study

Theoretically, this study contributes to the theoretical understanding of the relationship between life events and learning engagement among college students. It underscores the direct influence of positive life events on learning engagement and highlights the mediating role of self-control in the relationship between positive life events and learning engagement. Additionally, the study reveals that negative life events do not significantly affect students'

learning engagement. These findings help us better understand the impact of positive and negative life events on learning engagement, illustrating that positive life events can enhance students' self-control resources, which, in turn, increase their level of learning engagement.

Practically, the findings of this study provide reference for the development of educational strategies aimed at improving college students' learning engagement. To increase students' learning engagement, universities should not only implement measures to promote the occurrence of positive life events but also focus on strengthening students' self-control abilities. On one hand, universities should cultivate a positive campus culture and a harmonious learning atmosphere. This can be achieved through various initiatives, such as promoting positive campus publicity, organizing extracurricular activities, offering mental health courses, and encouraging class-based practices. These initiatives will help foster a positive campus environment, increase opportunities for students to engage in positive life events, and cultivate an optimistic attitude toward life. On the other hand, universities should take multiple measures to improve students' self-control abilities and encourage them to be self-disciplined and actively engage in learning. For example, mental health education courses can focus on developing self-control ability, while social practice activities can guide students in adhering to social norms and discipline. These efforts will empower students to strengthen their self-control abilities, which will in turn foster greater learning engagement.

8.4 Limitations and future research directions

This study has certain limitations. First, as a cross-sectional study, it cannot establish causal relationships between the variables. Second, the sample was drawn from universities only in Chongqing, which means that the results should be treated with caution when being generalized. In future studies, we should expand the sample to include multiple provinces and different types of universities, as well as employ a longitudinal design to further validate the study's findings.

9. Conclusion

This cross-sectional study aimed to explore how positive and negative life events impact Chinese college students' learning engagement, with particular attention to the mediating role of self-control in these relationships. The results of the study indicate that: (1) negative life events do not affect college students' learning engagement; (2) positive life events directly and positively predict learning engagement; (3) self-control partially mediates the effect of positive life events on learning engagement among college students.

Data Availability Statement

The dataset generated and analyzed during the current study is available from the corresponding author upon request.

Conflicts of interest

The authors declare no conflict of interest.

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