

Academic Motivation and Social Support: Mediating and Moderating the Life Satisfaction and Learning Burnout Link

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Background: The phenomenon of university students' learning burnout has attracted the research of many scholars because of its typicality. This study aims to explore the relationship between life satisfaction, academic motivation, social support and learning burnout among university students and its underlying mechanisms.

Methods: A total of 1917 university students participated in this cross-sectional study. Research instruments included the Adolescent Student Life Satisfaction Scale, University Students' Academic Motivation Questionnaire, Adolescent Learning Burnout Scale and Adolescent Social Support Scale. The data analysis comprised descriptive statistics, correlation analyses, and assessment of multicollinearity through Variance Inflation Factor (VIF). Advanced analyses were conducted using Model 4 for mediation and Model 1 for moderation from the PROCESS macro.

Results: (1) life satisfaction significantly and positively predicts academic motivation; (2) academic motivation significantly and negatively predicts learning burnout; and (3) life satisfaction significantly and negatively predicts learning burnout; (4) academic motivation partially mediates the effect of life satisfaction on learning burnout; and (5) social support plays a moderating role in the effect of academic motivation on learning burnout.

Discussions: These results illuminate the complex web of relationships among life satisfaction, academic motivation, social support, and learning burnout. The partial mediating role of academic motivation underscores its significance in the link between life satisfaction and learning burnout. Additionally, the moderating impact of social support emphasizes its role in ameliorating or exacerbating the effects of academic motivation on learning burnout.

Conclusion: These findings can help researchers and educators better understand the underlying mechanisms between life satisfaction and learning burnout. Meanwhile, the results of the study can provide practical and effective operational suggestions for preventing and intervening in university students' learning burnout and improving their academic motivation.

Keywords: life satisfaction, learning burnout, academic motivation, social support, mediating effect, moderating effect

Introduction

University is the stage when individuals' social behavior and psychological quality tend to mature. The trajectory of changes in psychological ability and belief perception of university students at this stage and the factors influencing them deserve the attention of society.¹ By 2022, the gross enrollment rate of higher education in China has reached 59.6%,² which means that China's higher education has entered the stage of universal development from massification, and the path of internal development is the way to go.³ However, the current learning situation of university students is not optimistic. Learning burnout is prevalent on campuses.⁴ In a study of an open-ended questionnaire survey of students in four universities in Wuhan, it is found that 72.2% of the students had varying degrees of study burnout.⁵ Learning burnout mainly refers to an individual's emotional exhaustion, depersonalization, and reduced sense of accomplishment during the learning process due to course stress, course load, or other psychological factors.⁶ Learning burnout has

a significant impact on students' academic life, overall well-being, and future career development.⁷ It reduces students' enthusiasm for education and leads to lower motivation, higher absenteeism and dropout rates, etc.⁸ It has been found that when college students are externally rewarded for learning, the higher their external motivation, the higher their self-efficacy. They are able to rely on high levels of academic motivation to enjoy the process of solving difficulties, thus showing lower learning burnout.⁹ Universities should provide students with a more conducive academic environment and more opportunities for professional practice; Society needs to encourage educators to provide more emotional support and recognition for students and to promote higher levels of engagement in learning by creating a positive academic and emotional atmosphere.¹⁰ At the same time, social support from families and schools enhances communication and exchanges between students and the community, thereby promoting students' physical and mental health and academic performance.¹¹ A survey of 456 undergraduate students from freshmen to juniors at eight universities in Beijing finds that learning burnout can be related to life satisfaction through the mediating role of comprehension social support.¹² In addition, a study of 573 university students from two universities in Jilin Province finds a negative correlation between learning burnout and social support.¹³ Moreover, a study of 454 university students from freshmen to seniors at Southwestern University also discovers that academic motivation is one of the internal factors that influence university students' learning burnout. University students' learning burnout is significantly related to academic motivation and attributional style plays a role in mediating the effect.¹⁴ To this end, this study will examine the relationship between learning burnout and life satisfaction, social support, and academic motivation among university students and the mechanisms that influence it. In the educational context of the transition from popularization to connotative development of higher education in the world, it is of great significance to explore the influence mechanism of university students' learning burnout in order to create a good learning atmosphere and improve the quality construction of higher education.

The Relationship Between Life Satisfaction and Academic Motivation

Life satisfaction is a process by which individuals perceive and judge their quality of life in general. Through this process, people are able to reflect on their current life circumstances.¹⁵ Individuals gain life satisfaction by feeling important emotional experiences such as relationships, support, and companionship from others.¹⁶ Students with high life satisfaction are able to make appropriate adjustments to their behavior, which increases their academic motivation.¹⁷ Most of the existing studies have analyzed academic motivation as a dependent variable. In this study, academic motivation will be used as a mediating variable to explore the relationship between life satisfaction and learning burnout. Academic motivation is the driving force for learners to put in effort and engage deeply in learning.¹⁸ In one study, authoritative parents' frequent use of threats and/or punishments to enforce rules and expectations have a negative impact on their children's mental health, decreasing their life satisfaction and affecting their self-emotional regulation system. This result in a bipolar state of weak or tight motivation for such children who are often limited by the demands of their parents.¹⁹ A number of studies have confirmed that life satisfaction positively predicts academic motivation.^{17,20-22} In summary, hypothesis H1 is proposed:

H1: There is a significant effect of life satisfaction on academic motivation.

The Relationship Between Academic Motivation and Learning Burnout

Academic motivation, which includes intrinsic and extrinsic motivation, is a key set of variables for understanding students' learning and performance (eg, grades and learning effectiveness).²³ The former mainly refers to starting an activity without any external stimulus because of the fulfillment of an internal psychological need and can be directed towards knowledge, achievement and enjoyable experiences. The latter is goal-oriented.²⁴ In order to learn something new, students need to have not only the required knowledge, skills and strategies, but also the inclination and willingness to learn. Academic motivation plays an important role in any task involving the acquisition, transfer and use of knowledge.²⁵ Learning burnout, on the other hand, refers to a state in which students experience persistent negative feelings about learning, inappropriate learning behaviors, and low academic achievement.²⁶ Students with learning burnout are tired of school-related activities and lose interest in academic learning.²⁷ There are many studies directly exploring the relationship between academic motivation and learning burnout, but fewer studies have been conducted

using academic motivation as a mediating variable. This study focuses on the mediating role of academic motivation in the relationship between life satisfaction and learning burnout. It has been established that academic motivation negatively predicts learning burnout.^{28–31} In summary, hypothesis H2 is proposed:

H2: There is a significant effect of academic motivation on learning burnout.

The Relationship Between Life Satisfaction and Learning Burnout

Life satisfaction is actually a psychological resource which is an important psychological factor influencing individuals' perception and control of stressful situations.³² The lower an individual's life satisfaction, the more anxiety, anger, and sadness can follow, which in turn can lead to burnout such as sleep disorders and headaches. Low happiness and high burnout levels are closely related.³³ Students with higher life satisfaction have higher levels of hope, optimism,³⁴ and are less prone to burnout with the combined effects of self-efficacy, resilience, and optimism.³⁵ Relatively little research has been done to explore life satisfaction and learning burnout. The role of other variables in this relationship will also be explored concurrently in this study. It has been established that life satisfaction is negatively correlated with learning burnout.^{36–39} In summary, hypothesis H3 is proposed:

H3: There is a significant effect of life satisfaction on learning burnout.

Mediating Effect of Learning Motivation

There are many studies on academic motivation, but few on academic motivation as a mediating variable to explore the relationship between life satisfaction and learning burnout. The acquisition and perception of life satisfaction can respond to the basic psychological needs of students. Individuals derive pleasure from learning something new. This pleasurable learning experience can ultimately further stimulate students' intrinsic motivation to learn.⁴⁰ Students with low life satisfaction lack self-commitment and reflective learning exploration behaviors. This lack of academic motivation translates into a lack of self-consistency over time, which in turn affects students' commitment to learning.⁴¹ Such students are more likely to feel ambivalent psychological experiences such as guilt and confusion, which depress their academic motivation.⁴² Life satisfaction is closely related to academic motivation. In addition, a study of medical students at Islamic Azad University in Tehran finds that high levels of academic motivation provides meaning to students' behaviors. Students are able to facilitate or promote learned behaviors by imagining their desired state. Students under the guiding effect of personal goals grasp negative emotions more rapidly. The higher the level of academic motivation, the stronger their adjustment and adaptation to learning burnout. Academic motivation is negatively related to learning burnout.⁴³ A survey of Danish university students reveals a direct positive correlation between life satisfaction and academic motivation, and a direct negative correlation between academic motivation and learning burnout.²⁰ In summary, hypothesis H4 is proposed:

H4: Academic motivation mediates the relationship between life satisfaction and learning burnout.

Moderating Effects of Social Support

Social support provides recipients with knowledge and information (informational support), eases difficulties in understanding and comforting (emotional support), provides feedback on accomplishments and problems (evaluative support) and creates tools to compensate for deficits (instrumental support).⁴⁴ Establishing and strengthening social support systems is important for university students to cope with stressors and improve mental health.⁴⁵ Social support is categorized into acquired social support and perceived social support. The former refers to actual support from those around the individual. The latter is the subjective perception and assessment of support from family, friends, and significant others, including emotional experiences and attitude formation.⁴⁶ Perceived social support can give individuals a sense of being valued, cared for, and loved.⁴⁷ There are many studies related to social support, but few studies have explored the relationship between life satisfaction and learning burnout using social support as a moderating variable. Research has found that high quality supportive social relationships create a psycho-social environment that

meets the needs of students. Students who receive high levels of social support are able to have higher levels of academic motivation, bringing about lower levels of academic stress and anxiety. Social support is positively correlated with academic motivation.⁴⁸ A number of studies show the similar views.^{49–52} In addition, an online learning study has found that the characteristics of online learning across time and space can lead to a lack of interaction between learners, which makes them susceptible to loneliness, distraction, and stress, and may further suffer from learning burnout. Without adequate social support and learning interactions during technology-assisted learning activities, students are more likely to experience burnout, and this burnout increases over time.⁵³ A number of studies have confirmed that social support helps buffer learning burnout and that it is negatively correlated with learning burnout.^{48,54–56} In summary, hypothesis H5 is proposed:

H5: Social support moderates the relationship between academic motivation and learning burnout.

This study constructs a mediation model and a regulation model to explore the influence mechanism of life satisfaction on learning burnout in a group of university students, with a view to provide new ideas for university students to improve their academic motivation. The theoretical model is shown in Figure 1:

Method

Data Sources and Sample Characteristics

The data collection for this study was systematically executed during the months of June and July 2023. Students from Xiamen University, Jimei University, Xiamen Institute of Technology, Wuxi Taihu Lake College, Guangzhou University, Guangdong Institute of Petroleum and Chemical Technology, Zhongshan College of the University of Electronic Science and Technology, and Zhaoqing University (the source colleges and universities involve different levels of domestic colleges and universities and are geographically widely distributed) were engaged as participants, selected via a convenience sampling methodology. This non-probabilistic sampling technique was chosen due to its feasibility, considering the expansive participant pool and the study's time constraints. Before embarking on full-scale data collection, we piloted the questionnaire with a smaller subset of participants. This pilot served to validate the clarity, relevance, and reliability of the questionnaire. Feedback from this process informed adjustments to optimize the questionnaire's validity and reliability.

A total of 2106 full-time university students were used as research subjects. Convenience sampling was employed to ensure diversity in terms of academic disciplines and demographics. After excluding invalid questionnaires, there were 1917 valid questionnaires, with a gender distribution of 56.91% males (n=1091) and 43.09% females (n=826). In terms of educational cultivation level, the vast majority, 93.74% (n=1797), were undergraduates, while the remainder, 6.26% (n=120), were postgraduates. When examining the distribution across academic majors, 77.67% (n=1489) of the participants were from Science and Engineering specialties, 18.73% (n=359) hailed from Arts disciplines, and the remaining 3.60% (n=69) were from other diverse academic domains. Inclusion criteria for participation included

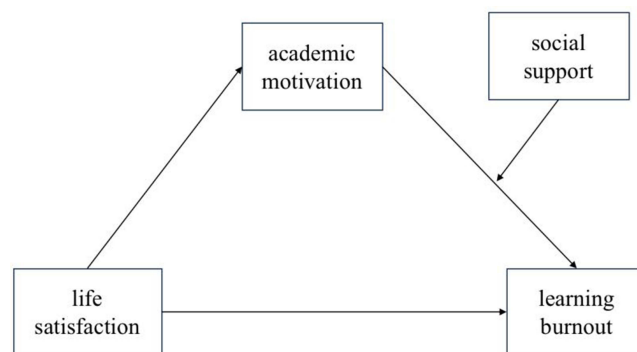


Figure 1 The theoretical model.

currently enrolled university students, while the exclusion criteria were limited to non-university participants and students who had previously taken the survey. The data acquisition process was facilitated through the Questionnaire Star online platform in Chinese, which eliminated geographical barriers and ensured broader coverage. Participants were given ample time to carefully complete the questionnaire, with an average expected completion time of 15 minutes. Given the digital nature of the survey, it was not confined to a physical location like a classroom, thus allowing participants the flexibility to respond at their convenience, further enhancing the likelihood of obtaining candid and comprehensive responses.

Research Instruments

Adolescent Student Life Satisfaction Scale

The Adolescent Student Life Satisfaction Scale was developed by Zhang and He in 2004.⁵⁷ The scale consists of 6 dimensions of friendship, family, academics, freedom, school and environment with 36 entries using 5-point scale. The KMO value of the scale was 0.956 and the study data was well suited for extracting information. The scale Cronbach's α coefficient was 0.912. The scale had good consistency and the measure was valid. After reversing the scoring of the reverse questions, all the items were summed and averaged to obtain the variable life satisfaction, which was used to indicate the level of life satisfaction, with higher scores indicating a higher degree of life satisfaction.

University Students' Academic Motivation Questionnaire

The academic motivation questionnaire for university students was developed by Tian and Pan in 2006.⁵⁸ The questionnaire contains 4 dimensions of interest in knowledge, competence pursuit, reputation acquisition and altruistic orientation with 34 entries using a 5-point scale. The KMO value of the questionnaire was 0.967 and the study data was well suited for extracting information.

In addition, the Cronbach's α coefficient of the questionnaire was 0.891. The scale had good consistency and the measurements were valid. After reversing the scoring of the reverse questions, all the items were summed and averaged to obtain the variable of academic motivation, which was used to indicate the degree of academic motivation, with higher scores indicating a higher degree of academic motivation.

Adolescent Learning Burnout Scale

The Adolescent Learning Burnout Scale was developed by Wu and Dai in 2007.⁵⁹ The scale is a self-assessment scale that includes 3 dimensions of physical and mental exhaustion, academic detachment and low achievement, with 16 entries and a 5-point scale. The KMO value of the scale was 0.906, and the study data were well suited for extracting information. Moreover, the Cronbach's α coefficient of the scale was 0.841. The scale had good consistency and the measurements were valid. After reversing the scoring of the reverse questions, all the items were summed and averaged to obtain the variable of learning burnout, which was used to indicate the degree of learning burnout, with higher scores indicating a higher degree of learning burnout.

Adolescent Social Support Scale

The Adolescent Social Support Scale was developed by Yuemei Ye et al in 2008.⁶⁰ The self-assessment scale consists of three dimensions, subjective support, objective support, and support utilization, with 17 entries on a five-point scale. The KMO value of the scale was 0.935, and the study data were well suited for extracting information. The Cronbach's α coefficient of the scale was 0.901. The scale had good consistency and the measurements were valid. After reversing the scoring of the reverse questions, all the items were summed and averaged to obtain the variable of life satisfaction, which was used to indicate the degree of life satisfaction, with higher scores indicating a higher degree of life satisfaction.

Research Design

Our study embraced a cross-sectional research design, strategically chosen to discern the relationships between university students' life satisfaction, academic motivation, social support, and learning burnout at a singular juncture. This design facilitated a comprehensive snapshot of the prevailing dynamics among the aforementioned variables within our sizable cohort of 1917 university students.

The data analysis was multifaceted. Preliminary analyses, including descriptive statistics and correlation analyses, were executed using SPSS, ensuring an initial understanding of data distribution and linear relationships. Subsequent advanced analyses delved into mediation and moderation effects, using Model 4 and Model 1 of the PROCESS macro, respectively. These analytical choices were tailored to extract nuanced insights into the underlying mechanisms between life satisfaction and learning burnout, with academic motivation and social support acting as potential mediators and moderators.

This design and methodological approach, rooted in established practices, aimed to provide a holistic understanding of the factors influencing university students' learning experiences, thereby advancing the field's knowledge base.

Data Processing

Descriptive statistics and Pearson correlation analysis were performed using SPSS 26.0. In order to ensure the accuracy of the results, the variance inflation factor (VIF) method was used in the study for the covariance test (if $VIF > 10$, it means that there is a serious covariance problem between the variables, and the corresponding variables need to be excluded). Meanwhile, the study used model 4 and model 1 in the process plug-in prepared by Hayes⁶¹ for chained mediation effect analysis and tested the significance of the mediation effect using the bias-corrected percentile Bootstrap method. It was considered statistically significant if the 99% confidence interval did not contain a value of zero.⁶² In addition, all variables were standardized beforehand to avoid bias in the moderating effects.

Findings

Common Method Bias Test

The issue of common method bias may arise when utilizing the self-report method of data collection. The common method bias test was performed using the Harman single-factor test.⁶³ The results showed that there were nine principal components with eigenvalues greater than 1. The first principal component explained 39.63% of the variance, which was below the critical criterion of 40%. Therefore, there is no serious common method bias in this study.

Descriptive Statistics and Correlation Analysis of the Variables

Four variables, including learning burnout, academic motivation, life satisfaction and social support, were analyzed for correlation, and the Pearson correlation coefficient test was used, considering that the main variables were all continuous variables. It was found that there was a significant positive correlation between the four components of life satisfaction, academic motivation, learning burnout and social support. The results are shown in [Table 1](#).

Test of Mediating Effect

Model 4 (Model 4 is a simple mediation model) in the SPSS macro developed by Hayes⁶¹ was used to test the mediating effect of academic motivation in the relationship between life satisfaction and learning burnout. The results were shown in [Table 2](#) and [Table 3](#). Life satisfaction was a significant negative predictor of learning burnout ($B = -0.472$, $p < 0.001$); And when the mediator variable was put in, life satisfaction remained a significant negative predictor of learning burnout, but the effect size was significantly lower ($B = -0.304$, $p < 0.001$). Motivation was a significant negative predictor of burnout ($B = -0.229$, $p < 0.001$); life satisfaction was a significant positive predictor of motivation ($B = 0.733$, $p < 0.001$), and to this point, Hypotheses 1, 2, and 3 were validated; Academic motivation was a significant negative predictor of learning burnout ($B = -0.229$, $p < 0.001$); life satisfaction was a significant positive predictor of academic motivation ($B = 0.733$, $p < 0.001$), and to this point, Hypotheses 1, 2, and 3 were validated; In addition, the upper and lower bounds of the bootstrap 95% confidence intervals for the direct effect of life satisfaction on learning burnout and the mediating effect of academic motivation did not contain 0 (see [Table 3](#)), suggesting that the mediating effect existed and was partially mediated, and hypothesis H4 was tested.

The results of the data indicated that life satisfaction significantly negatively predicted learning burnout, that academic motivation significantly negatively predicted learning burnout, and that life satisfaction was able to negatively predict academic burnout through the mediating effect of academic motivation. The mediation model was shown in [Figure 2](#).

Table 1 Correlation Analysis Between Variables

Items	Mean value	Standard Deviation	Learning Burnout	Academic Motivation	Life Satisfaction	Social Support
Learning burnout	2.895	0.607	1			
Academic motivation	3.620	0.660	-0.336**	1		
Life satisfaction	3.541	0.575	-0.447**	0.812**	1	
Social support	3.659	0.693	-0.363**	0.694**	0.771**	1

Note: **Indicated p<0.01.

Table 2 Mediation Model Test for Academic Motivation

Predictors (N=1061)	Learning Burnout		Academic Burnout		Learning Burnout	
	β	t	β	t	β	t
Constant	4.566***	59.966	1.010***	13.134	4.797***	60.906
Life satisfaction	-0.472***	-21.869	0.733***	34.206	-0.304***	-11.406
Academic burnout					-0.229***	-10.195
R ²	0.200		0.379		0.241	
Adjustment R ²	0.199		0.379		0.240	
F value	478.241***		1170.029***		303.944***	

Note: ***Indicated p<0.001.

Table 3 Total Effect, Intermediary and Direct Effects

	Effect Value	LL 95% CI	UL 95% CI	Efficacy Percentage
Total effect	-0.472	-0.51	-0.430	
Intermediary effect	-0.168	-0.198	-0.118	35.5%
Direct effect	-0.304	-0.357	-0.252	64.5%

Abbreviations: LL 95% CI, 95% BootCI lower bound; UL 95% CI, 95% BootCI upper bound.

Test of Moderating Effects

Again, Model 1 in the SPSS plug-in macro PROCESS prepared by Hayes⁶¹ was used with academic motivation as the independent variable, learning burnout as the dependent variable and social support as the moderating variable. The results were shown in Table 4, and the moderating effects were divided into three models. Model 1

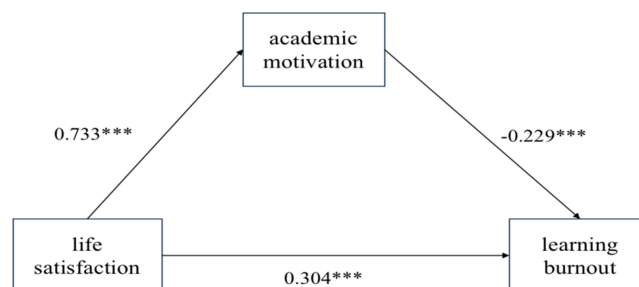


Figure 2 Intermediary model: effect size.

Note: ***p<0.001.

Table 4 Moderating Effect Test

Regression Equation (N=1061)		Fit Indicator			Coefficient of Significance	
Outcome Variable	Predictor Variable	R ²	Adjustment R ²	F value	β	t
Learning burnout	Constant	0.189	0.189	447.558***	2.895***	231.938
	Academic motivation				-0.386***	-21.156
Learning burnout	Constant	0.206	0.206	247.732***	2.895***	234.229
	Academic motivation				-0.301***	-13.332
	Social support				-0.138***	-6.247
Learning burnout	Constant	0.209	0.208	168.836***	2.882***	220.494
	Academic motivation				-0.287***	-12.482
	Social support				-0.128***	-5.636
	Academic motivation*				-0.046**	-2.996
	Social support					

Notes: **Indicated $p < 0.01$, ***Indicated $p < 0.001$.

included the independent variable (academic motivation). Model 2 included the moderating variable (social support) on the basis of model 1, and model 3 included the interaction term (the product term of the independent variable and the moderating variable) on the basis of model 2. The results showed that academic motivation significantly negatively predicted learning burnout ($\beta = -0.386$, $t = -21.159$, $p < 0.001$), and the interaction term between academic motivation and social support showed significance ($\beta = -0.046$, $t = -2.996$, $p < 0.01$). This meant that the magnitude of the effect of the moderating variable (social support) in the process of academic motivation in having an impact on learning burnout was significantly different at different levels, and this moderation was negative.

In order to test whether the pattern of this moderating effect is consistent with the hypothesis, we followed the suggestion of Aiken and West.⁶⁴ A social support score above the mean plus one standard deviation was considered the high group, and below the mean minus one standard deviation was considered the low group. The moderating effect of different social support was shown in Table 5, and its simple slope diagram was shown in Figure 3. The negative predictive relationship between academic motivation and learning burnout was stronger in the high social support group (simple slope = -0.319 , $p < 0.001$) and weaker in the low social support group (simple slope = -0.256 , $p < 0.001$). In addition, at different levels of academic motivation, the low social support group had higher learning burnout than the high social support group, so hypothesis H5 was supported.

Table 5 Moderating Role of Social Support

Levels of Moderator Variables	Regression Coefficients	Standard Errors	t	p	95% CI	
Mean	-0.287	0.023	-12.482	0.000	-0.332	-0.242
Low level (-1SD)	-0.256	0.027	-9.412	0.000	-0.309	-0.203
High level (+1SD)	-0.319	0.023	-13.683	0.000	-0.365	-0.273

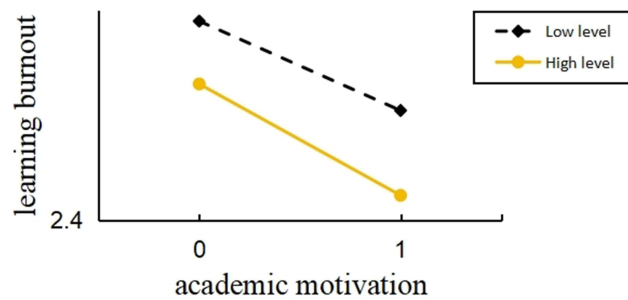


Figure 3 Moderating effects of high and low levels of social support.

Discussion

The Effect of Life Satisfaction on Academic Motivation

The results of this study showed that life satisfaction positively predicted academic motivation, ie, university student groups with higher levels of life satisfaction would have higher academic motivation, and conversely, university student groups with low life satisfaction had lower academic motivation. Life satisfaction can provide students with a sense of fulfillment and predispose them to think positively about the results of their efforts to learn. With the accumulation of positive beliefs, students are able to mobilize and use intrinsic goal orientation (motivation based on challenge, curiosity, or proficiency) and extrinsic goal orientation (motivation based on achievement, rewards, evaluation by others, and competition) in learning tasks.⁶⁵ Increased life satisfaction can contribute to students' feelings of self-efficacy in learning, experiences of success and good emotions, which can effectively mobilize students' academic motivation.^{66–68} Another study also notes that higher life satisfaction can help students adopt adaptive learning behaviors to complete academic tasks and challenges. Students' desire for more academic, interpersonal resources further motivates them to learn.⁶⁹ This study reaches similar conclusions. Students with high levels of life satisfaction mean that they show higher levels of engagement with self-care activities, have lower rates of perceived stress, and have a higher quality of life. The easier it is for such students to make a positive assessment of the current learning situation, which increases motivation. Students with lower life satisfaction are less able to easily transform negative emotions from the midst of academic stress, and the more difficult it is to accept and complete learning tasks.⁷⁰ It is significant for related departments and persons to take measures to improve students' level of life satisfaction. This study enriches the research in this area by using academic motivation as a mediating variable in the relationship between life satisfaction and learning burnout.

The Effect of Academic Motivation on Learning Burnout

The results of this study showed that academic motivation negatively predicted learning burnout, ie, university student groups with higher academic motivation had lower levels of learning burnout, and conversely, university student groups with low academic motivation had higher levels of learning burnout. Higher levels of motivation and students' desire to succeed help them to utilize positive learning strategies to solve learning problems and to confront learning self-imposed barriers with a growth mindset, thus reducing the occurrence of learning burnout.^{28,31} These students become more pragmatic about school goals and future career directions and tend to achieve separable, reward-based outcomes. This allows them to circumvent burnout behaviors tinged with resentment, resistance, and disinterest to the greatest extent possible. The lower the level of motivation, the less willing students are to assume their social roles because they do not feel or want to be valued by others, and the more likely they are to induce behaviors such as dropping out, withdrawing from school, and avoiding.⁷¹ They are unable to connect their personal learning goals to their satisfaction in performing learning tasks and thus tend to hold a boredom, disinterestedness, and disinterestedness mindset towards learning, which in turn makes them prone to learning burnout such as physical and mental exhaustion, cynicism, and other phenomena.⁷² This study reaches similar conclusions. Therefore, in order to reduce the negative impacts caused by university students' learning burnout, stakeholders can take measures to stimulate, maintain and enhance their academic motivation. There are many studies exploring the correlation between academic motivation and learning burnout, but fewer exploring the

relationship between learning burnout and other independent variables using academic motivation as a mediating variable. This study enriches the existing studies to some extent.

The Effect of Life Satisfaction on Academic Burnout

The results of this study showed that life satisfaction negatively predicted learning burnout, ie, university student groups with higher levels of life satisfaction had lower levels of learning burnout, and vice versa. Learning burnout is caused by external factors such as heavy academic loads and stressful learning environments, as well as internal factors such as the inability to effectively cope with learning pressure and inappropriate coping styles.⁷³ Students with low life satisfaction are unable to cope effectively with stress and recover quickly from stressors. Over time, this can lead to a decline in academic performance and in turn induce burnout behaviors such as sleep disorders, risk of serious mental illness, and substance use disorders.⁷⁴ Students with a high level of life satisfaction are able to self-adjust, calmly assess the situation, adapt and overcome adversity, and persevere in achieving their goals, even when under constant stress. In the process, life satisfaction buffers the negative effects of learning burnout.^{34,75} High life satisfaction during adolescence effectively moderates students' responses to stressful life events, protects them from adverse experiences, and serves as an effective buffer zone for learning burnout behaviors such as burnout, exhaustion, avoidance, and abandonment.⁷⁶ This study reaches similar conclusions. In conclusion, the higher the life satisfaction of university students, the better they are able to adapt to their studies and reduce the occurrence of learning burnout. Relatively few studies have been conducted to explore life satisfaction and learning burnout. This study also explores the role of academic motivation and social support in this relationship. For this reason, this study can contribute to a more systematic and comprehensive understanding of the influencing mechanism.

Mediating Effect of Academic Motivation

The results of this study showed that academic motivation played a partial mediating role between life satisfaction and learning burnout. That is, the higher the life satisfaction of the university student group, the higher their academic motivation ability, and thus the lower their learning burnout level will be. Increased life satisfaction guides students in setting learning goals. Students are more motivated to engage in a wider range of learning engagement behaviors out of a desire to achieve higher levels of academic success. Students' perception of academic motivation then further improves their ability to capture interest in learning, which reduces the emergence of burnout.⁷⁷ Students with higher levels of life satisfaction tend to perceive themselves as being in a positive, student-centered environment. Satisfaction with the educational environment, teacher-student relationships, and peer relationships can provide students with a sense of psychological security.⁷⁸ The easier it is for such students to adopt problem-based coping strategies and actively engage their motivation to adjust their learning behaviors. Students are able to recover from learning burnout and emotional fatigue more quickly when they feel the pleasure of achieving academic success through their efforts.⁷⁹ When students have high levels of life satisfaction, the higher their ability to perceive positive emotions, such as pride and joy from improved grades, and thus the higher their academic motivation. Such students exhibit fewer problem behaviors and are less likely to drop out of school.⁸⁰ Conversely, when students' life satisfaction is low, students tend to lose interest and motivation in learning,⁸¹ and instead focus on avoiding unwanted outcomes, placing their sense of self in anxiety. Unpleasant emotional experiences can cause students to develop self-doubt, making them more likely to believe that they lack sufficient learning ability to achieve a specific goal, which in turn causes them to be prone to more burnout behaviors of abandonment and avoidance.⁸² Although there are many studies on academic motivation and academic motivation and learning burnout, there are not many studies that explore the relationship between life satisfaction and learning burnout using academic motivation as a mediating variable. For this reason, this study enriches the existing research to some extent.

Moderating Effect of Social Support

This study found that as social support raised, the level of negative prediction of academic motivation on learning burnout would be higher, ie, relative to the group of university students with low social support, the inhibitory effect of their academic motivation on their learning burnout would be stronger for university students with high social support.

This suggests that in order to effectively reduce learning burnout, improving social support for university students at the same level of motivation is an effective measure. Students with too low academic motivation have an amplified perception of stress and their shallow learning strategies are used with increased frequency. Such students' burnout behaviors are more likely to be exacerbated by limited learning resources.⁸³ When students feel socially supported, they are able to feel a sense of identity in their interactions with the social environment, have more opportunities to express and expand their abilities, and aspire to further academic development, which can fully mobilize their motivation to learn.⁴⁹ In addition, a sense of social support helps students identify and maintain learning goals in complex learning environments, allowing them to experience less academic distress and reducing their complaining emotions, which reduces their symptoms of learning burnout such as anxiety, stress, and overwhelm.⁸⁴ A number of studies have confirmed the impact of teachers' social support on university students' motivation and burnout. A study of 1048 Spanish university students shows that a teacher-supported teaching style is beneficial for motivating students to learn, helping students acquire knowledge in a reflexive way, and improving their self-esteem, confidence, and enthusiasm for learning. These beneficial results reflect a state of meaningful learning that helps to improve students' academic performance and reduces their probability of maladjustment, which in turn reduces learning burnout.⁵⁴ Teacher social support is positively related to student academic motivation and negatively related to learning burnout. When students do not receive the desired teacher support, they are afraid to express themselves because of their "immature" ideas, which reduces their desire to share in the classroom. When students' academic motivation is undermined, they are unable to adopt effective and flexible learning coping strategies and are more prone to learning burnout such as mumbo-jumbo, timidity and avoidance.⁴⁸ When teachers provide students with ample learning opportunities and timely feedback on learning in the classroom, the positive benefits students receive further stimulate their academic motivation. Learning behaviors motivated by this intrinsic motivation can lead to a stable approach to learning, which promotes deeper learning and a more positive view of students' future professional competence, thus acting as a better moderator of burnout.⁸⁵ In addition to teachers, positive experiences from parental and peer support play an important role in students' cognitive, behavioral, and affective adjustment skills. The higher the level of social support, the more likely students are to develop their adjustment over time. These supportive relationships instill positive beliefs and competencies that motivate students to learn and help them apply viable learning strategies to cope with uncertain environmental conditions. These students are less likely to run away or give up even when they encounter difficulties in learning.⁸⁶ A great deal of studies have focused on the important impact of university students' social support on their learning, and there have been a number of studies on the relationship between social support and learning burnout. However, there are few studies that explore the relationship between life satisfaction and learning burnout by using social support as a moderating variable along with academic motivation as a mediating variable. This study expands and enriches related research.

Conclusions

This study examines the mechanisms by which university students' life satisfaction influences learning burnout, and the mediating effect of academic motivation and the moderating effect of social support in this process. This study finds that (1) life satisfaction significantly and positively predicts academic motivation; (2) academic motivation significantly and negatively predicts learning burnout; (3) life satisfaction significantly and negatively predicts learning burnout; (4) academic motivation partially mediates the effect of life satisfaction on learning burnout; and (5) social support plays a moderating role in the effect of academic motivation on learning burnout.

Learning burnout is one of the common challenges that affect student academic motivation and academic aspirations.⁴³ These findings help stakeholders understand the mechanisms underlying the relationship between life satisfaction and learning burnout. At the same time, the results of the study can provide practical and effective operational suggestions for university workers to prevent and intervene in university students' learning burnout and improve their academic motivation. First of all, improve the life satisfaction of university students. Universities should, as far as possible, create a comfortable accommodation environment, a safe eating environment and a free and harmonious interpersonal atmosphere for students, and offer colorful extracurricular activities. Teachers and parents should be more proactive in approaching students to provide a comfortable physical and psychological environment for

their learning and living. As individual university students, they should also learn to be proactive in building good relationships with others and integrating into the surrounding groups. These initiatives can help them to increase life satisfaction and thus reduce the occurrence of learning burnout. Students with higher life satisfaction tend to view success in college as socializing, rewarding, and aspirational, and they are more able to feel intrinsically motivated to attend college.⁸⁷ Secondly, improve academic motivation of university students. Universities can help students understand the significance of learning and clarify their career development plans by offering relevant courses and organizing lectures to stimulate their academic motivation, reduce learning burnout, and enable them to be more actively engaged in learning. Teachers and parents should also try to identify students' potential developmental qualities as much as possible and give them more guidance, encouragement and praise. For example, teachers can help students make meaningful connections between students' personal strengths and academic work based on their life goals and interests, supporting the positive development of adolescents' academic motivation.⁶⁶ Finally, provide more social support for university students. Universities should provide more platforms and more help for university students to study. Such as providing technical and methodological guidance for students' studies, internships and social practices. Students receive more appreciation, praise and support from teachers and peers, which enhances their sense of self-efficacy, stimulates their interest in learning, and makes them better able to accomplish their learning tasks. Parents should also give more positive guidance to university students, provide them with appropriate financial and spiritual support for their studies, and help them overcome the various obstacles encountered in the learning process. Through the concerted efforts of all parties, improve the life satisfaction and academic motivation of university students, and reduce their learning burnout as much as possible, so as to improve the learning quality of university students.

Contributions, Limitations and Prospects

Contribution

University students' learning burnout can affect their healthy development of body and mind. Many studies have been conducted to explore the phenomenon of burnout among university students.⁸⁸⁻⁹⁰ Relatively few focus on the relationship between life satisfaction and learning burnout among university students, even fewer explore the mechanisms by which both academic motivation and social support play a role in it. However, both are important for university students' learning and deserve further investigation. The study confirms that university students' life satisfaction significantly and negatively predicts learning burnout and motivation plays a partial mediating role in this process. In addition, social support plays a moderating role in the influence pathway of academic motivation and learning burnout. The study further enriches the theoretical research on university students' learning burnout, and can help people more comprehensively understand the mechanism of life satisfaction's influence on university students' learning burnout. At the same time, the study also has realistic revelation significance. At a time when learning burnout is common among university students, universities and related departments should take relevant measures as much as possible to improve university students' life satisfaction, academic motivation and social support. To help university students overcome learning difficulties, buffer negative emotions and adopt effective learning strategies to better adapt to university students' learning, thus reducing university students' learning burnout phenomenon.

Limitations and Prospects

In this study, 1917 students from different universities across the country were selected to conduct the research. There are some limitations of the study. On the one hand, the selection of the sample mainly follow the principle of convenience sampling, which lead to an uneven distribution of the sample across different grades, genders and schools. Meanwhile, different universities are located in different geographical areas. It is difficult to compare and analyze the situation of students in different universities. Subsequent related studies could use a variety of data collection methods to try to balance the sample across grades, genders, and schools, etc., to increase the likelihood of comparative analyses of the samples. On the other hand, the sample of this study was collected at one time, thus obtaining cross-sectional data, which leads to remain insufficient in the confirmation of inferences about the relationship of causal variables. Follow-up studies should collect data at different time periods whenever possible (eg, once every three months, three or four times in

a row). Multiple data collections and analyses will be used to track the development of the mechanism of life satisfaction's influence on university students' learning burnout over time.

Data Sharing Statement

The raw data supporting the conclusions of this article will be available from the authors on reasonable requests.

Ethics Approval and Consent to Participate

This study was conducted according to the guidelines of the Declaration of Helsinki, and approved by the Ethics Committee of Jimei University. Informed consent was obtained from all participants involved in this study.

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