



## A STUDY ON THE RELATIONSHIP BETWEEN POSITIVE PSYCHOLOGICAL QUALITY AND ACADEMIC PERFORMANCE OF COLLEGE STUDENTS

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### Cite this article:

Qin Y., Li R., Gao S., Nv L., Cheng C. (2023), A Study on the Relationship Between Positive Psychological Quality and Academic Performance of College Students. British Journal of Education, Learning and Development Psychology 6(3), 76-91. DOI: 10.52589/BJELDP-UENT7TT1

### Manuscript History

Received: 2 July 2023

Accepted: 20 Aug 2023

Published: 14 Sept 2023

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**ABSTRACT:** *In sharp contrast to the relevant research on positive psychological quality and academic performance in basic education, there is almost no relevant research in higher education in China. In order to explore the relationship between positive psychological quality and their academic performances of college students, and furthermore, whether positive psychological quality can affect their performances through the influence of academic self-efficacy and learning engagement, we conducted survey research among medical students in southwest and northeast China. We found that there are differences in positive psychological quality, academic self-efficacy, academic engagement and academic performance among students of different genders and grades. Girls' academic performance and engagement are higher than boys. The positive psychological quality of higher grades is better than that of lower grades. Positive psychological quality can affect academic performance alone, and the effect is more obvious when it is combined with academic self-efficacy. The positive psychological quality and academic self-efficacy can effectively affect learning engagement, which also can affect academic performance. However, learning engagement and academic self-efficacy have no mediating effect on positive psychological quality and academic performance.*

**KEYWORDS:** Positive Psychological Quality, Academic Performance, Chinese college students.



## INTRODUCTION

The term positive psychology originated in Maslow's 1954 book *Motivation and Personality*, and is often considered to be closely related to human psychology. Regardless of the debate, positive psychology has emerged on the contemporary stage and may dominate for decades. It focuses on helping people discover and utilize inner resources, create positive experiences, and transform past experiences for the better. It focuses on positivity and prosperity more than negativity and failure, on the present and future more than the past, on introspection and meaning more than action and performance. All these require us to break away from the traditional scientific vision and look at the life and experience of individuals and groups from a more humanistic, meaningful, intentional, autonomous, and even future perspective (Lee, 2017).

### Relative Research

Chinese scholars have paid attention to the impact of positive psychological qualities on academic performance for a long time. In recent years, there have been a lot of relevant results. A survey conducted on 605 primary school students in urban and rural areas of Hefei province by using the "China Positive Psychological Quality Scale for Primary school students" revised by Meng Wanjin and Zhang Chong found that the positive psychological quality of primary school students was significantly positively correlated with the scores of Chinese, mathematics, English and the total average scores. The psychological qualities such as spiritual touch, intellectual curiosity, cooperative ability, friendliness and modesty significantly predict Chinese performance. Psychological qualities such as conscientiousness, cooperation, emotional touch and tolerance significantly predict mathematics scores. Cooperation and sincerity positively predict English performance; the positive psychological qualities such as cooperation, emotional touch, bearing, tolerance, modesty and friendliness significantly predicted the total average score (Wei, 2016). Using the same scale, the research on the relationship between parents' parenting style, positive psychological quality and academic performance of junior high school students found that positive psychological quality and academic performance of junior high school students were significantly positively correlated (Peng, 2020). Another study on 779 junior high school students on the role of academic self-efficacy and learning engagement in the chain mediation of positive psychological quality and learning adaptation found that junior high school students' positive psychological quality, learning engagement, academic self-efficacy and learning adaptation are significant positive correlations. On the basis of the mediating effects of academic self-efficacy and learning engagement respectively and their chain mediating effects, positive psychological quality can have either positive or negative effects on learning adaptation (Liu, 2021). An experiment of integrating positive psychology into junior middle school mathematics teaching in the Taiwan area also confirmed that the effective education with positive psychology tendency can significantly relieve the learning anxiety from school and family, thus significantly reducing the math learning anxiety. The effective education of positive psychology has an obvious function in boosting students' willingness to learn mathematics and their academic performance (Lee, 2017).

In the past five years, many studies have focused on the positive psychological quality of college students, and many of them have verified that music and sports can effectively interfere with the positive psychological quality of college students through experimental research methods (Chen, 2019; Tang, 2018; Ye, 2023). Ye Jiayu (2023) summarized the research on the



positive psychological quality of college students in China. It is found that the study of positive psychological quality in China mainly focuses on the academic emotion, social adjustment and other aspects related to students' study and life. The intervention means of positive psychological quality are mostly seen in group counseling, college ideological and political classes, sports activities and so on. Positive psychological quality has a positive effect on individual subjective well-being, life satisfaction, physical health, mental health and other aspects. Therefore, the positive psychological quality of college students is reflected in the improvement of their own positive quality level and the indirect development of mental health level, happiness and other aspects. However, there are not many studies concerned about positive psychological quality and academic performance in college students. A study on the mediating effect of positive mental quality on Internet addiction and academic emotion of college students found that positive mental quality can positively predict academic emotion, and positive mental quality plays a partial mediating role between internet addiction and academic emotion (Lin et al., 2018).

To sum up, it can be found that positive psychological quality has received extensive attention, and there are a lot of studies on the relationship between positive psychological quality and academic performance, but they mainly focus on the basic education stage such as primary and secondary schools in China. There are a lot of practical results in the study of college students, but there are few that pay attention to the relationship between positive psychological quality and academic performance. The high output of positive psychological quality and academic performance in basic education is in sharp contrast to that in higher education.

## METHOD

### Research design

Liu's (2021) study have confirmed that junior high school students' positive psychological quality, learning engagement, academic self-efficacy and learning adaptation have no significant difference in gender, and no significant difference in grade, while junior high school students' academic self-efficacy, learning engagement and learning adaptation show significant differences in grade. Positive psychological quality, learning engagement, academic self-efficacy and learning adaptation are all positively correlated. On the basis of the mediating effects of academic self-efficacy and learning engagement respectively and their chain mediating effects, positive psychological quality can have either positive or negative effects on learning adaptation.

This study can draw on the idea of her research but change the objects from junior high school students to college students. Otherwise, we also plan to replace learning adaptation with academic performance, so as to directly observe the impact of positive psychological qualities on academic performance.

First, it verifies the differences of positive psychological quality, learning engagement, academic self-efficacy and academic performance of college students in gender and grade. The second is to verify the correlation of positive psychological quality, learning engagement, academic self-efficacy and academic performance. The third is to examine whether the positive psychological quality of college students can affect their academic performance, and whether the positive psychological quality can affect their performance through the influence of academic self-efficacy and learning engagement.



## Research Objectives

This research is based on the research experience of positive psychological quality and academic performance, and focuses on college students. This study decided to be carried out in a small range and a specific group in order to explore the way, so the research object was limited to undergraduate students in medical colleges and universities.

## Research Tool

This study uses the questionnaire survey method, and the questionnaire selects the Positive Psychological Quality Scale of Chinese College Students compiled by Meng Wanjin, The Academic Self-Efficacy Scale by Bian Yufang and the Learning Engagement Scale by Fang Laitan. As for the observation of academic performance, we directly select their grade point average (GPA) as the observation index.

Professor Meng Wanjin combined with China's national conditions, referring to the six virtues and 24 positive psychological qualities proposed by Seligman et al. measured 1,300 Chinese college students (1029 valid data) in 2009, and compiled the Positive Psychological Quality Scale for Chinese college students (Meng & Guan, 2009). The scale consists of six subscales, including 20 positive qualities and 62 items. The six dimensions are subscale wisdom and knowledge dimension - the power of cognition; Including "creativity", "curiosity", "love of learning" and "thinking and observation"; courage dimension - emotional strength, including "sincerity", "courageous persistence" and "enthusiasm"; the human dimension - interpersonal strength, including "feeling love", "love and kindness" and "social intelligence"; the justice dimension - the strength of citizenship, including "team spirit", "integrity and fairness" and "leadership"; the moderation dimension - avoiding extreme forces, including "tolerance", "modesty", "prudence" and "self-control"; the transcendental dimension - the power of spiritual belief, including "heart touch", "humor" and "hope and faith". The statistical test proves that the scale has good reliability and validity, the overall Cronbach's coefficient of this questionnaire is 0.857, indicating that the questionnaire has good reliability. There is a significant correlation between the six dimensions and the overall positive psychological quality of college students at the level of 0.30, indicating that the questionnaire has good structural validity. The standardized factor load of each item is greater than 0.30, indicating that the content validity is good and can be used to evaluate the development of positive psychological quality of contemporary Chinese college students. This scale has been widely recognized and applied in the measurement of positive psychological quality of college students in China (Li, Xu, Su & Lin, 2022; Su, 2021; Ye, 2023). Therefore, the scale has good reliability and validity, and can well test the status quo of Chinese college students' positive psychological quality.

Based on Bandura's "three-way interaction theory" and self-efficacy theory, Bian Yufang selectively absorbed various relevant theories and compiled the academic self-efficacy scale by herself. After five rounds of revision and structural verification of the first draft, the academic self-efficacy scale containing two dimensions of basic competence and control was finally formed. The sense of basic competence refers to an individual's perception of good learning results, the performance of goals, the perception of their own talents, and the expectation of future learning to illustrate an individual's perception of their basic abilities. The sense of control refers to whether the individual thinks that he is hard enough, can self-discipline, can consciously resist interference, can grasp his learning environment, whether the



feeling of the learning environment is positive or negative, and whether he can effectively control the learning process to explain the individual's sense of control over learning. The scale contains 10 items and is scored by 7 points. The higher the score, the higher the sense of academic self-efficacy (Bian, 2004). This scale is also widely used in college students. In 2022, a study was conducted on 768 undergraduate students in Shanghai. Cronbach's A coefficient of this scale was 0.81, indicating good reliability (Wang, 2022).

According to the UWES-S (Utrecht Work Engagement Scale-Student) scale compiled by Schaufeli, Fang Laitan launched the UWES-S scale suitable for Chinese cultural background in 2008. Her scale includes 17 questions and three sub-dimensions; namely, Vigor, Dedication and Absorption. Through the measurement of 79 undergraduate students and 188 graduate students, the internal consistency reliability of each scale is between 0.82-0.95, the correlation coefficient is significant, and between 0.76-0.77, and the item load is between 0.42-0.81, which has a good fitting index (Fang, Shi & Zhang, 2008). The reliability and validity coefficient of this scale is high, and it is widely used in the study of college students (Liu, 2021).

### Sampling

This study adopts the method of random sampling, through the questionnaire star platform, an online questionnaire platform, the questionnaire is distributed to the class group, so as to obtain the survey objects. In order to ensure the representativeness of the sample, we selected Southwest Medical University in Southwest China, Hebei Medical University in North China and Heilongjiang University of Chinese Medicine in Northeast China as the delivery universities of the questionnaire.

## RESULT

### Demographic data

221 samples were collected from 27 out of 34 provinces, autonomous regions, municipalities and special administrative regions, accounting for 79.41% (see picture 1). Through data screening, 3 invalid data were excluded, and 218 valid data were retained. Among them, the ratio of male to female is 2:1, and the grades are mainly sophomore and junior. (Table 1)

**Table 1: Gender and Grade Distribution**

Gender	N	Percentage	Grade	N	Percentage
Boy	80	36.70%	Freshman	37	17%
girl	138	63.30%	Sophomore	119	54.60%
			Junior	60	27.50%
			Senior	2	0.90%
Total	218				

### Common Method Deviation Analysis

There is no significant common variance bias in this sample. Through the Haman single factor test, the results showed that 16 common factors were extracted when factor rotation was not performed and the Eigenvalues were greater than 1. The explained percentage of variance of





the first common factor was 30.07%, which was less than 40%, so it could be considered that there was no serious common variance bias in this survey.

### Demographic variables of positive psychological quality, academic self-efficacy, learning engagement and academic performance

#### Gender differences in positive psychological quality, academic self-efficacy, learning engagement and academic performance.

The gender difference of each variable is mainly reflected in the difference of GPA and learning engagement between male and female students. The independent sample T-test showed that the GPA of female students was significantly higher than that of male students ( $t=-2.31$ ,  $p < 0.05$ ). In terms of learning engagement, not only was the total score of the learning engagement scale significantly higher for girls than boys ( $t=-2.912$ ,  $p < 0.01$ ), but also in three dimensions of Vigor ( $t=-2.18$ ,  $p < 0.05$ ), Dedication ( $t=-2.64$ ,  $p < 0.01$ ) and Absorption ( $t=-3.318$ ,  $p < 0.001$ ). (Table 2).

**Table 2: Gender differences in each variable**

		Gender (M±SD)		t
		Boy (83)	Girl (163)	
GPA		2.99±0.54	3.15±0.48	-2.31*
	Cognition	3.73±0.57	3.67±0.53	0.73
Positive psychological quality	Interpersonal	3.81±0.57	3.77±0.50	0.548
	Emotion	3.81±0.59	3.71±0.56	1.189
	Justice	3.77±0.62	3.70±0.53	0.994
	Moderation	3.69±0.61	3.56±0.60	1.539
	Transcendental	3.82±0.60	3.71±0.58	1.363
	Positive psychological quality	233.91±34.10	228.63±30.75	1.171
Academic self-efficacy	sense of basic competence	4.48±0.82	4.60±0.76	-1.087
	sense of control	4.48±0.89	4.71±0.77	-2.004
	Academic self-efficacy	44.81±7.69	46.56±7.07	-1.703
	Vigor	4.29±1.31	4.65±0.96	-2.18*
Learning engagement	Dedication	4.59±1.34	5.05±1.06	-2.64**
	Absorption	4.34±1.24	4.89±1.01	-3.318***
	Learning engagement	74.72±20.59	82.48±15.70	-2.912**

Note : \*  $p < 0.05$ , \*\* $p < 0.01$ , \*\*\* $p < 0.001$

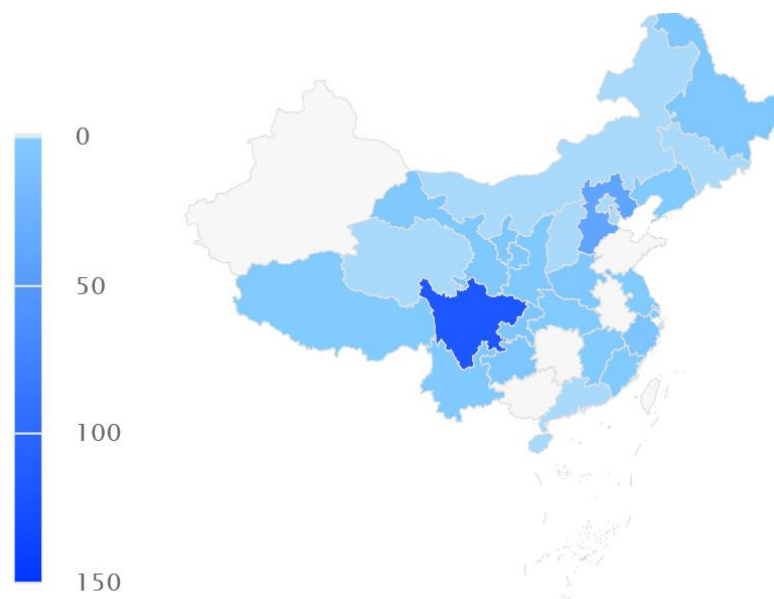


Figure 1. The nationwide distribution of the sample

### Grade differences in positive psychological quality, academic self-efficacy, learning engagement and academic performance

There were significant differences in positive psychological quality and its dimensions in different grades. Analysis of variance (ANOVA) found that there were no significant differences in learning engagement and academic self-efficacy among different grades, but significant differences in positive psychological quality and its subscales. After multiple comparisons (LSD), it was found that the total score of positive psychological quality, cognition dimension, interpersonal dimension, emotion dimension, justice dimension, moderation dimension and transcendence dimension were significantly higher in junior than in sophomore and freshman (Table 3).

**Table 3: The difference between variables at different grades**

ANOVA	LSD		
Variables	F	Variables	Mean Deviation
Positive psychological quality	6.26***	Junior > freshman	19.02342*
		Junior > Sophomore	20.72045*
cognition	5.274**	Junior > freshman	0.28224*
		Junior > Sophomore	0.32555*
interpersonal	6.292**	Junior > freshman	0.29153*
		Junior > Sophomore	0.34011*
emotion	5.909**	Junior > freshman	0.38935*
		Junior > Sophomore	0.34143*
justice	5.19**	Junior > freshman	0.29444*



		Junior > Sophomore	0.33553*
		Junior > freshman	0.26514*
moderation	4.081**	Junior > Sophomore	0.32412*
		Junior > freshman	0.31369*
transcendence	4.917**	Junior > Sophomore	0.33961*
Academic self-efficacy	1.089		
sense of basic competence	1.408		
sense of control	1.062		
Learning engagement	0.918		
Vigor	1.036		
Dedication	1.342		
Absorption	0.794		

Note : \*  $p < 0.05$ , \*\* $p < 0.01$ , \*\*\* $p < 0.001$

### **Correlation analysis of positive psychological quality, academic self-efficacy, learning engagement and academic performance**

According to Pearson correlation test, positive psychological quality, academic self-efficacy, learning engagement and academic performance are significantly positively correlated. GPA and positive psychological quality ( $R=0.202$ ,  $P < 0.01$ ), academic self-efficacy ( $R=0.185$ ,  $P < 0.01$ ) and learning engagement ( $R=0.52$ ,  $P < 0.05$ ); there was a significant positive correlation between GPA and emotion, transcendence and concentration, but there was no significant correlation between GPA and emotion, transcendence and concentration. There is no significant correlation between the self-control dimension of positive psychological quality and the sense of control dimension of academic self-efficacy.

### **Regression analysis of positive psychological quality, academic self-efficacy, learning engagement and academic performance**

### **Regression analysis of positive psychological quality, academic self-efficacy, learning engagement and academic performance**

The results of correlation analysis show that regression analysis can be made between positive psychological quality, academic self-efficacy, learning engagement and academic performance. Through linear regression and stepwise entry mode, the regression model is constructed as follows: (Table 4).



**Table 4 Regression Analysis**

Dependents	Independents	Fitted Value		ANOVA		Model		Collinearity Diagnostics	
		R <sup>2</sup>	Durbin - Watson	F		β	t	Tolerance	VIF
GPA	positive psychological quality	0.04	1.89	9.19**		0.003	3.03**	1.00	1.00
academic self-efficacy	positive psychological quality	0.08	2.14	18.66***		0.06	4.32***	1.00	1.00
learning engagement	positive psychological quality	0.39	1.89	70.02***		0.10	3.25**	0.92	1.09
	academic self-efficacy					1.36	9.99***	0.92	1.09
GPA	positive psychological quality	0.06	1.87	6.7**		0.003	2.36*	0.92	1.09
	academic self-efficacy					0.005	2.02*	0.92	1.09
GPA	learning engagement	0.023	1.85	5.09*		0.004	2.26*	1.00	1.00

Note : \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

$$\text{Model 1 : } y = 2.34 + 0.003\chi$$

Model 1 shows that positive psychological quality has a positive prediction on academic performance, and every 1 unit increase of positive psychological quality will increase academic performance by 0.003 units.

$$\text{Model 2 : } y = 31.05 + 0.06\chi$$

Model 2 shows that positive psychological quality has a positive prediction on academic self-efficacy, and every 1 unit of positive psychological quality increases academic self-efficacy by 0.06 units.

$$\text{Model 3 : } y = -6.09 + 0.1\chi_1 + 1.36\chi_2$$

Model 3 shows that positive psychological quality and academic self-efficacy have a positive predictive effect on learning engagement. When positive psychological quality and academic self-efficacy increase by 1 unit, academic engagement increases by 0.1 unit and 1.36 unit respectively.

$$\text{Model 4 : } y = 2.04 + 0.003\chi_1 + 0.005\chi_2$$

Model 4 shows that positive psychological quality and academic self-efficacy have a positive predictive effect on academic success. For each unit increase of positive psychological quality and academic self-efficacy, academic performance increases by 0.003 units and 0.005 units



respectively.

$$\text{Model 5 : } y = 2.75 + 0.004x$$

Model 5 shows that learning engagement has a positive predictive effect on academic performance. Every 1 unit increase in learning engagement increases academic performance by 0.004 units.

According to the regression analysis among the four variables of positive psychological quality, academic self-efficacy, learning engagement and academic performance, the contribution of other single variables is weak except that academic self-efficacy has a large effect on learning engagement. It should be noted that Model 4 excluded the variable of learning engagement during iteration. These results indicate that after adding positive psychological quality and academic self-efficacy, learning engagement does not significantly predict academic performance.

The unary linear regression analysis of academic performance and learning engagement found that the positive linear relationship between learning engagement and academic performance was significant. These results suggest that the influence of learning engagement on academic performance may not be combined with positive psychological quality and academic self-efficacy.

In conclusion, although positive psychological quality has a significant linear relationship in predicting academic self-efficacy, learning engagement and academic performance, its contribution is not high. However, when multiple variables acted at the same time, the fitting was significantly improved.

### **Regression Analysis of each Dimension and Categories**

Based on the regression model between variables, regression models between different dimensions of variables are further constructed. The regression model is also constructed through linear regression and the entry mode of stepwise is adopted as follows: (Table 5).

**Table 5 Regression analysis between dimensions**

Dependents	Independents	Fitted value		ANOVA	Model		collinearity diagnostics	
		R <sup>2</sup>	Durbin-Watson	F	β	t	Tolerance	VIF
GPA	cognition	0.35	1.95	9.99** *	0.34	2.74**	0.23	4.24
	transcendental				-0.41	-3.83***	0.27	3.65
	interpersonal				0.31	2.42*	0.24	4.14
academic self-efficacy	Dedication	0.42	2.19	38.50* **	0.39	4.85***	0.41	2.44
	interpersonal				4.23	3.64***	0.39	2.58
	Vigor				1.30	2.38*	0.40	2.50
	moderation				-2.29	-2.32*	0.41	2.43
learning engagement	sense of control	0.64	0.89	49.7** *	9.29	5.96***	0.54	1.84
	cognition				7.45	3.99***	0.86	1.16
	sense of basic competence				3.71	2.14*	0.49	2.06

Note : \* p<0.05, \*\*p<0.01, \*\*\*p<0.001

$$\text{Model 6 : } y = 2.2 + 0.34 \chi_1 - 0.41 \chi_2 + 0.31 \chi_3$$

Model 6 shows that the cognition, transcendental and interpersonal dimensions of positive psychological qualities have a significant impact on academic performance. Every 1 unit increase in cognitive and interpersonal qualities increases academic performance by 0.34 and 0.31 units respectively, and every 1 unit increase in transcendental qualities decreases academic performance by 0.41 units.

$$\text{Model 7 : } y = 20.39 + 0.39 \chi_1 + 4.23 \chi_2 + 1.30 \chi_3 - 2.29 \chi_4$$

Model 7 shows that interpersonal and abstinence in positive psychological qualities, dedication and vitality in academic engagement have significant effects on high academic self-efficacy. When dedication, interpersonal and vigor increase by 1 unit, academic self-efficacy increases by 0.39 units, 4.23 units and 1.3 units respectively. When moderation increases by 1-unit, Academic self-efficacy decreases by 2.29 units.

$$\text{Model 8 : } y = 9.29 \chi_1 + 3.71 \chi_2 + 7.45 \chi_3 - 7.84$$

Model 8 shows that the cognition dimension of the sense of control and the sense of basic competence and the positive psychological quality of the academic self-efficacy have a positive prediction on the learning engagement. Every 1 unit increase of the sense of control, the sense of basic competence and the cognition, the learning engagement will increase by 9.29, 3.71 and 7.45 units.



## An analysis of the chain mediating effect of academic self-efficacy and learning engagement on positive psychological quality and academic performance

The results of correlation analysis show that it is possible to further analyze the mediating effect of academic self-efficacy and learning engagement. Therefore, in this study, the bias correction percentile Bootstrap method proposed by Hayes and model 6 in Process v2.16.3 of SPSS macros were used to analyze and test the mediation effect of academic self-efficacy and learning engagement on positive psychological quality and learning performance.

Table 7 shows that academic self-efficacy and learning engagement play a statistically insignificant mediating role between positive psychological quality and academic performance. Specifically, there are three paths where indirect benefits come into play. Route 1: Positive psychological quality has an impact on academic performance through academic self-efficacy, 95% confidence interval is [-0.001, 0.0003], including 0, the mediating effect is not significant. Route 2: Positive psychological quality has an impact on academic performance through academic self-efficacy and then through learning engagement. The 95% confidence interval is [-0.005, 0.0004], including 0, and the mediating effect is not significant. Route 3: Positive psychological quality has an impact on academic performance through learning engagement, 95% confidence interval is [-0.008, 0.0004], including 0, the mediating effect is not significant. However, the direct effect, that is, the positive psychological quality has a direct impact on academic performance at 95% confidence interval is [0.0004, 0.005], excluding 0, the direct effect is significant, accounting for 84.38% of the total effect.

**Table 7: The mediating effect of academic self-efficacy and learning engagement**

Effect type	Value	Boot SE	Bootstrap	
			95%CI	
			BootLLCI	BootULCI
Direct effect : positive psychological quality-GPA	0.0027	0.0012	0.0004	0.005
Total indirect effect(s)	0.0005	0.0005	-0.0003	0.0017
Ind1 : positive psychological quality-academic self-efficacy-GPA	0.0007	0.0004	-0.0001	0.0017
Ind2 : positive psychological quality-academic self-efficacy-learning engagement-GPA	-0.0001	0.0002	-0.0005	0.0004
Ind3 : positive psychological quality-learning engagement-GPA	-0.0001	0.0003	-0.0008	0.0004



## CONCLUSION AND DISCUSSION

### **There are differences in positive psychological quality, academic self-efficacy, academic engagement and academic performance among students of different genders and grades**

#### **Girls' academic performance and engagement are higher than boys'**

The significant difference between girls' learning engagement and academic performance indicates that the difference in academic performance may be related to learning engagement. The linear regression results also show that learning engagement does have a positive predictive effect on academic performance. Positive psychological quality and academic self-efficacy have a positive predictive effect on learning engagement, but there is no significant difference between male and female positive psychological quality and academic self-efficacy, which means that there are other factors affecting female college students' learning engagement than that of male students.

#### **The positive psychological quality of higher grades is better than that of lower grades**

The positive psychological quality of the junior is obviously better than that of freshman and sophomore, but there is no significant difference between freshman and sophomore, indicating that the positive psychological quality of the college students surveyed has no change in the first and second year after entering the school, but has improved significantly after the third year. This improvement is reflected in all dimensions of cognition, interpersonal, emotional, justice, moderation and transcendence, indicating that this transformation is comprehensive, not driven by a single or several dimensions. This difference indicates that the positive psychological quality of the college students in this survey has been comprehensively improved by some factors from their sophomore year to their junior year. These factors may be internal or external. According to the law of psychological development, an individual's mental state will change with the increase of age, and the significant improvement of positive psychological quality from sophomore to junior year is probably one of the links of this law of physical and mental development. However, it should also be noted that the law of physical and mental development is a long and vague period of time, and the change of positive psychological quality in the clear time point from sophomore to junior year is likely to be affected by external factors, such as the continuous attention of the school to mental health education make the effects of this education emerge in the junior year.

### **Positive psychological quality and academic self-efficacy can effectively affect academic performance**

#### **Positive psychological quality can effectively affect academic performance**

Positive psychological quality can directly and effectively affect academic performance, among which the cognition dimension, transcendental dimension and interpersonal dimension have a clear impact on academic performance, indicating that "creativity", "curiosity", "love of learning", "thinking and observation", "feeling love", "love and friendliness" and "social intelligence" have a positive impact on academic performance. It should be noted that the positive effects of "heart touch", "humor" and "hope and faith" on academic performance need to be further studied.



### **The positive influence of good academic self-efficacy and positive psychological quality on academic performance is more obvious**

Although positive psychological quality can positively affect academic performance, statistical analysis shows that the influence is weak, while the inclusion of academic self-efficacy has a slightly stronger impact on academic performance, indicating that having both positive psychological quality and academic self-efficacy can have a better positive impact on academic performance. However, it should be noted that this effect is not chain, that is, it is not that positive psychological quality affects academic self-efficacy and thus academic performance, but that positive psychological quality and academic self-efficacy simultaneously affect academic performance.

### **Positive psychological quality and academic self-efficacy can effectively affect learning engagement**

Positive psychological quality and academic self-efficacy can affect learning engagement at the same time, and the influence degree is close to 40%, indicating that positive psychological quality and academic self-efficacy have a strong influence on learning engagement. In terms of positive psychological quality and academic self-efficacy, cognition, sense of basic competence and sense of control were statistically significant, indicating that academic self-efficacy had a stronger impact on learning engagement.

### **Learning engagement can affect academic performance**

Learning engagement has a positive effect on academic performance, but the contribution is weak. And among the three dimensions, only the dedication dimension shows a positive prediction on academic performance. In the test of mediating effect, the routine of positive psychological quality affecting academic performance through learning engagement is not significant, indicating that, first, among college undergraduates, learning engagement does have an impact on academic performance, but it does not play a very important role in the level of academic performance as in basic education. Second, in the positive psychological quality, academic self-efficacy, learning engagement and academic performance of undergraduates, learning engagement does not affect academic performance together with positive psychological quality and academic self-efficacy at the same time, nor does it play a chain intermediary effect before positive psychological quality and academic performance.

### **The influence of positive psychological quality on academic performance is direct**

Although positive psychological quality and academic self-efficacy can affect academic performance simultaneously, positive psychological quality and academic self-efficacy can affect learning engagement simultaneously, and learning engagement can also affect academic performance. However, college undergraduates' academic self-efficacy and learning engagement did not mediate between positive psychological quality and academic performance, and positive psychological quality directly affected academic performance.





## DECLARATIONS

This work was supported by Social Psychological Services and Crisis Intervention Research Program of Luzhou City (ID:LZX-2023018).

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