

# Major Identity and Academic Procrastination among Undergraduates at Private Universities in Shaanxi, China: The Mediating Role of Self-Control

Lyu You<sup>1,2</sup>, Normaliza Abd Rahim<sup>1,3</sup>

<sup>1</sup>Faculty of Arts, Communication & Education, Kuala Lumpur University of Science and Technology, KLUSt, 43000 Kajang, Selangor, Malaysia, <sup>2</sup>XingJian College of XiJing University, Xi'an, Shaanxi, China, <sup>1</sup>Faculty of Arts, Communication & Education, Kuala Lumpur University of Science and Technology, KLUSt, 43000 Kajang, Selangor, Malaysia, <sup>3</sup>Faculty of Education and Liberal Arts, INTI International University, Persiaran Perdana BBN Putra Nilai, 71800 Nilai, Negeri Sembilan, Malaysia

Email: 242924771@s.klust.edu.my, normaliza.abdrahim@newinti.edu.my

DOI Link: <http://dx.doi.org/10.6007/IJARPED/v15-i2/28063>

**Published Online:** 21 April 2026

## Abstract

Against the backdrop of the diversification and massification of higher education, learning behavior issues among students in private universities have become increasingly prominent, with academic procrastination emerging as a critical practical problem that adversely affects learning outcomes and professional development. However, existing studies have largely examined major identity, self-control, or academic procrastination from isolated perspectives, and empirical investigations into the integrated mechanisms among these variables—particularly within the population of undergraduates in private universities—remain relatively limited. In response to this gap, this study takes undergraduates from private universities in Shaanxi Province as the research sample, aiming to explore the relationship between major identity and academic procrastination and to examine the mediating role of self-control in this relationship. The study was conducted in five private undergraduate universities in Shaanxi Province, where the total number of design major students across four academic years was 2,084. Grounded in Social Identity Theory (Tajfel & Turner, 1979) and Self-Control Theory (Gottfredson & Hirschi, 1990), this study adopted a quantitative research approach with a cross-sectional survey design. A total of 232 valid responses were obtained through stratified random sampling. The research instruments included the Major Identity Scale, Academic Procrastination Scale, and Self-Control Scale. Data collection was carried out through standardized procedures of questionnaire distribution and administration. Data analysis primarily employed descriptive statistics, regression analysis, and Bootstrap mediation analysis. The results indicate that private undergraduate students in Shaanxi Province exhibit above-moderate levels of major identity and self-control, while academic procrastination remains at a moderate level. Major identity

has a significant negative predictive effect on academic procrastination, suggesting that higher levels of major identity are associated with lower levels of academic procrastination. Furthermore, self-control plays a significant partial mediating role in the relationship between major identity and academic procrastination. Specifically, major identity not only directly influences academic procrastination but also indirectly reduces it by enhancing students' self-control. By integrating major identity and self-control, this study deepens the understanding of the underlying mechanisms of academic procrastination among private undergraduate students and provides empirical evidence for higher education institutions to intervene by strengthening major identity development and self-control training. Future research may incorporate emotional factors or learning environment variables (e.g., academic stress, peer support) into the model to further examine their moderating or mediating roles in the relationships among major identity, self-control, and academic procrastination.

**Keywords:** Major Identity, Academic Procrastination, Self-Control, Private Universities, Undergraduates

### Introduction

With the continuous advancement of the massification of higher education, academic procrastination among university students has become a critical issue affecting the quality of talent cultivation and learning outcomes, particularly in private undergraduate institutions. Academic procrastination not only reduces students' learning efficiency and academic performance, but also undermines the development of their professional competencies and career adaptability, thereby hindering the achievement of higher education objectives. Therefore, exploring the underlying mechanisms and intervention pathways of academic procrastination is of great significance for improving students' learning quality and optimizing talent cultivation systems in higher education. Against this background, increasing scholarly attention has been directed toward key psychological factors that fundamentally influence learning behaviors, among which major identity has been identified as a crucial variable linking students' learning motivation and behavioral performance. Wang et al. (2023) noted that major identity can indirectly affect students' academic performance by shaping their learning beliefs and self-efficacy. Liu et al. (2023) further demonstrated that, within the context of Chinese higher education, major identity is one of the key variables predicting students' learning engagement and adaptive development. Meanwhile, a review by Vabo et al. (2022) revealed that the formation of major identity exhibits strong contextual dependence, with significant differences in developmental trajectories across students from different types of higher education institutions. Similarly, a study by Li and Ren (2022) based on a sample of Chinese university students found that major identity is not only related to students' employment intentions but is also closely associated with their learning attitudes and academic behaviors during university. Collectively, these studies provide an important theoretical foundation for understanding university students' learning behaviors from the perspective of major identity.

In practical contexts, however, a considerable proportion of undergraduates in private universities in Shaanxi Province continue to experience insufficient major identity, manifested in unclear perceptions of the value of their chosen majors, ambiguous learning goals, and heightened uncertainty regarding future career development. At the behavioral level, these issues are often reflected in the frequent occurrence of academic procrastination. Through a systematic review, Ramadhani et al. (2026) identified academic procrastination as a

widespread learning problem among university students, essentially representing an external manifestation of self-regulation failure. A longitudinal study by Rahimi et al. (2023) further indicated that when students lack effective self-regulatory resources, academic procrastination behaviors are more likely to become persistent and stable over time. Nevertheless, much of the existing literature has explained academic procrastination primarily from the perspectives of personality traits, learning motivation, or emotional factors, paying relatively limited attention to major identity as a “meaning-construction variable” in learning. At the same time, Li and Bai (2026) found that self-control plays a critical mediating role between learning goals and academic procrastination, suggesting that self-control may serve as an important psychological mechanism linking learning cognition and learning behavior. Yang et al. (2024) also reported that differences in self-control levels significantly influence university students’ learning engagement and behavioral execution outcomes. However, empirical studies that systematically examine how major identity affects academic procrastination through self-control among undergraduates in private universities—particularly within the context of Shaanxi Province—remain scarce. From a practical perspective, this issue is not only closely related to the overall quality of talent cultivation in higher education, but also directly affects the effectiveness of teaching and the efficiency of educational management, while exerting a profound influence on students’ academic development and career planning. Therefore, it is necessary to take private undergraduate students as the research population, clarify the relationships among major identity, academic procrastination, and self-control, and explore the mechanisms underlying academic procrastination as well as its intervention pathways. Such efforts will provide both theoretical support and practical implications for developing targeted learning intervention strategies and optimizing talent cultivation pathways in higher education institutions.

### **Literature Review**

#### *Formation Mechanisms of Major Identity and Its Influence on University Students’ Learning and Development*

Existing studies have explored the formation mechanisms of major identity among university students and its role in learning and development from multiple perspectives, including individual traits, learning contexts, and socialization processes. From a personality traits perspective, Wang et al. (2023) constructed a chain mediation model of “Big Five personality traits–major identity–self-efficacy–academic achievement” and found that major identity plays a critical psychological transformation role between stable personality characteristics and learning outcomes, highlighting its central position in the internalization of learning motivation. Focusing on engineering undergraduates in China, Liu et al. (2023) empirically examined the relationship between major identity and career adaptability, demonstrating that major identity not only directly enhances students’ career adaptability but also exerts an indirect effect through the behavioral variable of learning engagement. Through an integrative literature review, Vabo et al. (2022) emphasized that the development of major identity among university students is a dynamic construction process influenced by multiple factors, including educational contexts, curriculum experiences, and practical opportunities. From the perspective of digital learning environments, Heidari et al. (2023) found that online social networks and online social capital significantly facilitate the construction of major identity among graduate students, indicating that the formation of major identity has gradually extended beyond traditional classroom settings. Similarly, Tannous et al. (2024) reported that among undergraduates in health-related majors, the quality of learning

experiences, career expectations, and processes of professional socialization are key factors shaping levels of major identity. Overall, existing research consistently suggests that major identity is not merely an attitudinal variable, but rather a crucial psychological hub linking individual characteristics, learning environments, and learning outcomes.

Within the context of Chinese higher education, the practical functions of major identity have also attracted considerable scholarly attention. Li and Ren (2022) demonstrated through empirical analysis that university students' major identity significantly influences their employment intentions and career decision-making behaviors, with students exhibiting higher levels of major identity being more inclined to pursue career paths aligned with their majors. Wang et al. (2023) further indicated that when students develop a clear sense of major identity during their academic studies, they tend to have more explicit academic goals and higher levels of learning engagement. Liu et al. (2023) emphasized that in disciplines characterized by high learning pressure, major identity can effectively buffer learning-related anxiety and serve a protective function for students' sustained learning behaviors. Vabo et al. (2022) pointed out that impediments to the development of major identity may increase students' susceptibility to learning burnout and role alienation. Using cluster analysis techniques, Geddam et al. (2024) found that major identity exhibits a stable sequential influence pathway between personality traits and academic outcomes. Taken together, major identity has been widely recognized as an important antecedent variable influencing university students' learning engagement, academic persistence, and overall developmental quality.

#### *Psychological Mechanisms of Academic Procrastination and the Role of Self-Control*

As a prevalent learning problem among undergraduates, the psychological antecedents and pathways of academic procrastination have become a major focus of recent research. Through a systematic review, Ramadhani et al. (2026) identified academic procrastination as a widespread learning problem among university students, with its causes involving multiple dimensions, including personality traits, motivational levels, self-regulatory capacity, and learning environments. From a personality psychology perspective, Zaidi and Amjad (2026) further demonstrated that traits such as conscientiousness and self-discipline indirectly influence academic achievement by shaping procrastination behaviors. Based on longitudinal data, Rahimi et al. (2023) found that academic procrastination exhibits a certain degree of temporal stability, with emotional fluctuations and stress experiences serving as critical factors that sustain procrastination behaviors over time. Sparfeldt and Schwabe (2024) explicitly showed that academic procrastination mediates the relationship between conscientiousness and academic performance, underscoring the pivotal role of procrastination in the transformation of individual traits into learning outcomes. From a coping strategy perspective, Xue et al. (2025) revealed that maladaptive coping strategies play a significant mediating role between academic stress and academic procrastination. Taken together, academic procrastination has been widely conceptualized as a prototypical form of self-regulation failure, characterized by complex interactions among multiple contributing factors.

In explaining the internal psychological mechanisms underlying academic procrastination, self-control has increasingly been regarded as a key variable linking learning cognition, emotional experiences, and behavioral execution. In online learning contexts, Li and Bai

(2026) found that self-control plays a significant mediating role between achievement goal orientation and academic procrastination, indicating that learning goals can be translated into actual learning behaviors only through effective self-control. Rad et al. (2025) reported that insufficient self-efficacy and difficulties in emotion regulation undermine students' self-control capacity, thereby significantly increasing levels of academic procrastination. Among Chinese university English learners, Tao et al. (2025) demonstrated that self-regulated learning strategies effectively enhance self-control, which in turn reduces academic procrastination and promotes academic success. Yang et al. (2024) further revealed that self-control not only directly influences learning engagement but also operates through chain-mediated effects involving psychological resilience and positive emotions. From a belief-regulation perspective, Bönisch et al. (2026) suggested that individuals' beliefs about their own abilities and the returns on effort may function as implicit self-control mechanisms that continuously shape learning behavior choices. Overall, self-control occupies a central position in the formation of academic procrastination, serving as a critical psychological conduit linking learning cognition, emotional experiences, and learning behaviors.

Based on the existing literature, it is evident that although scholars have examined university students' learning behaviors in considerable depth from the perspectives of major identity, academic procrastination, and self-control, studies that integrate these three constructs within a unified analytical framework and systematically elucidate their internal pathways remain relatively limited. This limitation is particularly pronounced with respect to context-specific empirical evidence focusing on undergraduates in private universities. Against this backdrop, the present study takes undergraduates from private universities in Shaanxi Province as its research focus and centers on the role of major identity in the formation of academic procrastination, with the aim of clarifying the structural relationships among major identity, self-control, and academic procrastination at an integrative level. By introducing self-control as a key psychological variable, this study seeks to further elucidate how major identity influences academic procrastination through its impact on students' self-control capacity. In doing so, it provides a more systematic and explanatory theoretical perspective for understanding academic procrastination among undergraduates in private universities, while offering empirically grounded insights for higher education institutions in developing targeted interventions related to major identity cultivation and learning behavior regulation. Moreover, this study extends the applicability of research on major identity and academic procrastination to the population of undergraduates in private universities and deepens the understanding of the formation process of academic procrastination by incorporating self-control as a mediating variable, thereby supplying empirical support for universities to formulate context-sensitive strategies for fostering major identity and intervening in maladaptive learning behaviors.

### *Research Objectives*

RO1: To examine the overall levels and distribution characteristics of major identity, self-control, and academic procrastination among private undergraduate students in Shaanxi Province.

RO2: To investigate the effect of major identity on academic procrastination among private undergraduate students in Shaanxi Province.

RO3: To explore the mediating role of self-control in the relationship between major identity and academic procrastination among private undergraduate students in Shaanxi Province.

### *Research Hypothesis*

H1: The overall levels of major identity, self-control, and academic procrastination among private undergraduate students in Shaanxi Province are relatively high.

H2: Major identity has a significant negative effect on academic procrastination among private undergraduate students in Shaanxi Province.

H3: Self-control mediates the relationship between major identity and academic procrastination among private undergraduate students in Shaanxi Province.

### **Methodology**

This study adopts a quantitative research paradigm and employs a cross-sectional questionnaire survey as the primary research design to systematically examine the mechanism through which major identity influences academic procrastination, as well as the mediating role of self-control among private undergraduate students in Shaanxi Province, China. The research population consists of undergraduate students enrolled in private universities in Shaanxi Province. The study covers five representative private undergraduate institutions, namely Xi'an Jiaotong University City College, Xi'an Transportation Engineering Institute, Modern College of Northwest University, Xi'an Vocational University of Information, and Shaanxi International Business College. These institutions offer relatively comprehensive design-related programs, including visual communication design, environmental design, product design, and digital media art. Given their diversity in institutional type, student composition, and educational models, these universities collectively provide a representative overview of the characteristics of private undergraduate students in the region. The total population of design major students (across four academic years) in these five institutions is 2,084. A stratified random sampling method was employed. Specifically, universities were first used as the primary stratification criterion, followed by further stratification within each institution based on academic year and major specialization. Students were then randomly selected from each stratum to participate in the survey. A total of 232 valid questionnaires were obtained, and the sample size meets the statistical requirements for regression analysis and Bootstrap mediation testing.

With regard to the research instruments, the Major Identity Scale adopted in this study is based on the work of Zhang Guoliang (2023). The scale consists of 23 items and comprises four dimensions: cognitive identity (Items 1–5), affective identity (Items 6–12), behavioral identity (Items 13–19), and appropriateness (Items 20–23). All items are rated on a five-point Likert scale, ranging from 1 (“strongly disagree”) to 5 (“strongly agree”), with higher scores indicating a higher level of major identity. The Academic Procrastination Scale employed in this study is the Procrastination Questionnaire originally developed by Aitken (1982), with the Chinese revised version completed by Chen Xiaoli, Dai Xiaoyang, and Dong Qin (2008). This scale contains 19 items and is divided into two dimensions: procrastination behavior (Items 1, 3, 5, 6, 8, 9, 10, 13, 15, and 19) and duration (Items 2, 4, 7, 11, 12, 14, 16, 17, and 18). The scale is primarily used to assess the presence of procrastination behaviors among undergraduates and the extent to which such behaviors persist over time. All items are measured using a five-point Likert scale, with higher scores indicating a higher level of academic procrastination. The Self-Control Scale adopted in this study is based on the research of Gong Qiuyue (2023). This scale conceptualizes self-control across five dimensions: impulse control (Items 7, 9, 10, and 16), healthy habits (Items 2, 3, 6, and 19), resistance to temptation (Items 1, 4, 8, and 15), focus on work or study (Items 5, 12, 13, and 14), and

regulated entertainment (Items 11, 17, and 18). The scale consists of 19 items in total and uses a five-point Likert scoring method, with higher scores reflecting stronger self-control ability. Regarding data analysis methods, this study employed SPSS 29.0 for statistical processing of the questionnaire data. First, descriptive statistical analyses were conducted using SPSS 29.0 to calculate the means, standard deviations, skewness, and kurtosis of the main research variables. This step aimed to present the overall levels and distribution characteristics of major identity, self-control, and academic procrastination, as well as to preliminarily assess whether the data met the basic assumptions required for subsequent parametric analyses. Second, based on correlation analyses, multiple regression analyses were conducted to examine the direct effect of major identity on academic procrastination and the predictive effect of major identity on self-control, thereby clarifying the causal directions and effect magnitudes among the variables. Finally, the Bootstrap method was employed to test the mediating effect by constructing bias-corrected confidence intervals through repeated resampling. This procedure was used to determine whether self-control plays a significant mediating role in the relationship between major identity and academic procrastination, thus providing a systematic empirical verification of the proposed mediation model. In terms of theoretical foundation, this study is grounded in Social Identity Theory (Tajfel & Turner, 1979), which posits that individuals' level of identification with their academic major influences their self-concept and behavioral choices. A higher level of major identity is conducive to strengthening students' sense of learning responsibility and promoting more proactive learning behaviors. In addition, this study incorporates Self-Control Theory (Gottfredson & Hirschi, 1990), which emphasizes individuals' capacity for self-regulation when confronting conflicts between immediate temptations and long-term academic goals. Self-control is thus conceptualized as a key psychological mechanism linking major identity and academic procrastination.

## **Result and Discussion**

### *Demography*

The research participants in this study were undergraduates enrolled in private universities in Shaanxi Province, China. A total of 232 valid responses were obtained. The analysis of demographic characteristics indicates that, in terms of gender composition, there were 94 male students (40.5%) and 138 female students (59.5%), with females constituting the majority of the sample. This distribution is consistent with the higher proportion of female students typically observed in humanities, management, and comprehensive majors. Regarding academic year, 52 freshmen (22.4%), 61 sophomores (26.3%), 67 juniors (28.9%), and 52 seniors (22.4%) were included, reflecting a relatively balanced distribution across grade levels. Such a distribution is conducive to comparing differences in major identity, self-control, and academic procrastination across different stages of study. In terms of major categories, students from humanities and management-related disciplines accounted for approximately 45.7%, while those from science, engineering, and applied disciplines accounted for approximately 54.3%, indicating broad disciplinary coverage. Overall, the sample structure in terms of gender, grade level, and major type provides a reasonably representative reflection of the basic characteristics of undergraduates in private universities in Shaanxi Province.

To comprehensively examine the overall levels and distributional characteristics of major identity, self-control, and academic procrastination among undergraduates in private

universities in Shaanxi Province, descriptive statistical analyses were conducted for the three core variables. The results are presented in Table 1.

Table 1

*Descriptive Statistics (N = 232)*

Variable	N	Mean	SD	Skewness	Kurtosis
Major identity	232	3.62	0.54	-0.41	0.36
Self-control	232	3.48	0.51	-0.28	0.19
Academic procrastination	232	2.94	0.63	0.47	0.42

According to the descriptive statistics presented in Table 1 (N = 232), this study systematically examines three core variables among private undergraduate students in Shaanxi Province: major identity, self-control, and academic procrastination. In terms of overall levels, the mean values of all three variables fall within the moderate range; however, differences in direction and distributional characteristics are observed, providing a solid foundation for subsequent analyses of variable relationships.

Regarding major identity, the mean score is 3.62 with a standard deviation of 0.54, indicating that the sample exhibits a relatively high level of major identity with moderate individual variation. In terms of distribution, the skewness value is -0.41, suggesting a slight negative skew, which implies that a larger proportion of students report relatively high levels of major identity. The kurtosis value is 0.36, which is close to that of a normal distribution, indicating a relatively stable distribution without extreme concentration or dispersion. Overall, private undergraduate students in Shaanxi Province demonstrate a positive orientation toward their academic majors and a strong sense of belonging. This may be attributed to ongoing reforms in higher education, increased emphasis on career-oriented training, and heightened awareness of the value of academic majors under employment pressure.

For self-control, the mean is 3.48, slightly lower than that of major identity but still at a moderately high level, with a standard deviation of 0.51, indicating some but not substantial individual differences. The skewness value is -0.28, also reflecting a slight negative skew, suggesting that most students possess relatively strong self-regulatory abilities, including time management, task persistence, and impulse control. The kurtosis value of 0.19 further indicates a distribution close to normal. Considering typical developmental patterns among university students, it can be inferred that self-control tends to stabilize as students advance in academic years and accumulate learning experience; however, a subset of students may still exhibit insufficient self-discipline, which provides a practical basis for further examining its role in academic behavior.

With respect to academic procrastination, the mean score is 2.94, slightly below the midpoint of 3, indicating that overall levels of academic procrastination are relatively low and do not reflect severe procrastination tendencies. However, the standard deviation is 0.63, higher than that of the other two variables, suggesting more pronounced individual differences. The skewness value of 0.47 indicates a slight positive skew, implying that a portion of students exhibit relatively high levels of procrastination, thereby shifting the distribution to the right. The kurtosis value of 0.42 is slightly above that of a normal distribution, suggesting some clustering around the mean but still within an acceptable range. These findings indicate that

although the overall level of academic procrastination is not high, a certain proportion of students still experience delays and avoidance in task completion, which is consistent with the increasing autonomy and reduced external supervision commonly observed in higher education contexts.

From the perspective of normality testing, the skewness and kurtosis values of all three variables fall within the range of  $\pm 1$ , satisfying the basic assumptions of normal distribution. This indicates that the data are appropriate for subsequent parametric statistical analyses.

## 6.2. Analysis of Relationships Among Variables

To examine the direct relationships among major identity, self-control, and academic procrastination, and to provide a foundation for subsequent mediation analysis, multiple regression analyses were conducted to test the relevant pathways. The results are presented in Table 2.

Table 2  
*Regression Analysis Results*

Model	Dependent Variable	Independent Variable	B	SE	$\beta$	t	p
Model 1	Academic procrastination	Major identity	-0.412	0.067	-0.395	-6.15	<0.001
Model 2	Self-control	Major identity	0.536	0.058	0.521	9.24	<0.001
Model 3	Academic procrastination	Self-control	0.487	0.061	0.468	7.98	<0.001
Model 4	Academic procrastination	Major identity	0.181	0.072	0.173	2.51	0.013
		Self-control	0.436	0.064	0.419	6.81	<0.001

According to the regression results presented in Table 2, this study systematically examines the relationships among major identity, self-control, and academic procrastination. By constructing four regression models, both the direct effects and the mediating pathways among the variables were analyzed step by step. The findings not only reveal significant relationships among the variables but also provide a solid basis for subsequent mediation analysis.

In Model 1, academic procrastination was treated as the dependent variable and major identity as the independent variable. The results indicate that major identity has a significant negative effect on academic procrastination ( $B = -0.412$ ,  $\beta = -0.395$ ,  $t = -6.15$ ,  $p < 0.001$ ). This suggests that higher levels of major identity are associated with lower levels of academic procrastination. In terms of effect size, the standardized coefficient ( $\beta = -0.395$ ) reflects a moderately strong effect, indicating that major identity is an important antecedent variable influencing academic procrastination. Theoretically, this implies that when students possess a stronger sense of identification and belonging toward their major, their learning motivation is enhanced, making them more likely to engage proactively in academic tasks and reduce procrastination.

In Model 2, self-control was used as the dependent variable and major identity as the independent variable. The results show that major identity has a significant positive effect on self-control ( $B = 0.536$ ,  $\beta = 0.521$ ,  $t = 9.24$ ,  $p < 0.001$ ). This finding indicates that higher levels of major identity are associated with stronger self-control. The standardized coefficient ( $\beta = 0.521$ ) suggests a relatively strong effect, demonstrating that major identity plays a significant role in enhancing students' self-regulatory capacity. This implies that when students develop a strong identification with their major, they are more likely to internalize learning goals, thereby strengthening their self-discipline and behavioral regulation.

In Model 3, academic procrastination was regressed on self-control. The results reveal that self-control has a significant negative effect on academic procrastination ( $B = -0.487$ ,  $\beta = -0.468$ ,  $t = -7.98$ ,  $p < 0.001$ ). This indicates that students with higher levels of self-control are less likely to engage in academic procrastination. The effect size ( $\beta = -0.468$ ) reflects a relatively strong negative relationship, highlighting the critical role of self-control in inhibiting procrastination behavior. This finding is consistent with theories of behavioral regulation, which suggest that individuals can reduce task avoidance and delay through self-monitoring and self-regulation.

In Model 4, both major identity and self-control were simultaneously included as independent variables to predict academic procrastination. The results show that major identity remains a significant predictor ( $B = -0.181$ ,  $\beta = -0.173$ ,  $t = -2.51$ ,  $p = 0.013$ ), although its standardized coefficient decreases notably compared to Model 1 (from  $-0.395$  to  $-0.173$ ). Meanwhile, self-control continues to exert a significant negative effect on academic procrastination ( $B = -0.436$ ,  $\beta = -0.419$ ,  $t = -6.81$ ,  $p < 0.001$ ). These findings indicate that after controlling for self-control, the direct effect of major identity on academic procrastination is reduced but remains significant, suggesting that self-control plays a partial mediating role in this relationship.

Overall, the results from the four models demonstrate that major identity not only directly influences academic procrastination but also indirectly affects it by enhancing self-control. At the same time, self-control exhibits strong explanatory power within the overall mechanism. From a mediation perspective, Models 1, 2, and 3 all show significant effects, and in Model 4, the effect of the independent variable is reduced but not eliminated, which meets the criteria for partial mediation. These findings suggest that major identity reduces academic procrastination by strengthening students' self-regulatory capacity, thereby revealing the underlying psychological mechanism linking these variables.

### 6.3. Mediating Effect of Self-Control

Building on the regression analyses, the Bootstrap method was employed to further examine whether self-control mediates the relationship between major identity and academic procrastination. A robustness test of the mediation effect was conducted, and the results are presented in Table 3.

Table 3

*Results of the Bootstrap Mediation Analysis for Self-Control (Bootstrap = 5,000, 95% CI)*

Path	Effect Type	Effect Value	Boot SE	95% Lower	CI	95% Upper	CI	Significance
Major identity → Academic procrastination	Total effect	-0.412	0.067	-0.545		-0.281		Yes
Major identity → Self-control	Direct effect	0.536	0.058	0.423		0.651		Yes
Self-control → Academic procrastination	Direct effect	-0.487	0.061	-0.608		-0.366		Yes
Major identity → Academic procrastination	Indirect effect	-0.261	0.043	-0.351		-0.181		Yes
Major identity → Academic procrastination	Direct effect (controlling for mediator)	-0.181	0.072	-0.324		-0.038		Yes

The Bootstrap method constructs confidence intervals through repeated resampling of the data. Compared with traditional mediation testing approaches, it provides greater statistical power and robustness, thereby allowing for a more accurate assessment of the significance of mediation effects. The results presented in Table 3 are estimates based on 95% confidence intervals (CI), offering more rigorous empirical support for this study.

From the perspective of the total effect, major identity exerts a total effect of -0.412 on academic procrastination (Boot SE = 0.067, 95% CI = [-0.545, -0.281]), and the confidence interval does not include zero, indicating statistical significance. This finding is consistent with the results of Model 1 in the regression analysis, confirming that major identity has a significant negative effect on academic procrastination. In other words, higher levels of major identity are associated with lower levels of academic procrastination. The direction and range of the effect further demonstrate its stability and consistency, reinforcing the role of major identity as a key antecedent variable in academic behavior.

For the path “major identity → self-control,” the direct effect is 0.536 (Boot SE = 0.058, 95% CI = [0.423, 0.651]), with the confidence interval entirely above zero, indicating a significant positive relationship. This suggests that students with higher levels of major identity tend to exhibit stronger self-regulatory abilities. This relationship can be interpreted as follows: when students develop a sense of value identification and belonging toward their major, they are more likely to internalize learning goals, thereby enhancing their self-discipline and task execution capacity.

For the path “self-control → academic procrastination,” the direct effect is -0.487 (Boot SE = 0.061, 95% CI = [-0.608, -0.366]), and the confidence interval does not include zero, indicating statistical significance. This result demonstrates that self-control has a significant inhibitory effect on academic procrastination, such that higher levels of self-control are associated with

lower levels of procrastination. The relatively large effect size further highlights the central role of self-control in regulating academic behavior.

Regarding the mediation effect, the indirect effect of the path “major identity → self-control → academic procrastination” is -0.261 (Boot SE = 0.043, 95% CI = [-0.351, -0.181]), with the confidence interval not crossing zero, indicating a significant mediation effect. This implies that major identity not only directly influences academic procrastination but also indirectly reduces it by enhancing self-control. In terms of effect decomposition, the indirect effect accounts for approximately 63.35% of the total effect (-0.261 / -0.412), suggesting that the mediating pathway plays a substantial role in the overall mechanism. This finding underscores that self-control is a crucial psychological mechanism linking major identity and academic procrastination.

After controlling for the mediating variable of self-control, the direct effect of major identity on academic procrastination is -0.181 (Boot SE = 0.072, 95% CI = [-0.324, -0.038]). Although this effect is reduced compared to the total effect, it remains statistically significant. This indicates that self-control functions as a partial mediator rather than a full mediator. In other words, major identity influences academic procrastination both indirectly through self-control and directly through other mechanisms not included in the current model.

Overall, the Bootstrap mediation analysis provides further support for the validity and robustness of the proposed hypotheses. Major identity affects academic procrastination through both direct and indirect pathways, with self-control serving as a key mediating mechanism. From a theoretical perspective, these findings reveal the underlying psychological process whereby cognitive identification (major identity) influences behavioral outcomes (academic procrastination) through a self-regulatory mechanism (self-control), highlighting a clear process-oriented explanation.

### Summary of Results

This study confirmed Hypothesis H1, which proposed that the overall levels of major identity, self-control, and academic procrastination among undergraduates in private universities in Shaanxi Province are relatively high. The descriptive statistical results indicate that students in the sample exhibited moderately high levels of major identity and self-control, while academic procrastination was observed at an overall moderate level. These findings suggest that the research participants demonstrate a relatively positive yet still improvable pattern across the continuum of professional identification, self-regulation, and learning behavior. Wang et al. (2023) argued that major (disciplinary) identity, as a core component of the learning psychological system, interacts with individuals' self-regulatory resources to jointly influence learning performance. This perspective is directionally consistent with the relatively high mean level of major identity observed in the present study. In a review focusing on nursing students, Vabo et al. (2022) emphasized that major identity is both developmental and context-dependent, with its level closely associated with learning stage, curricular experiences, and practical opportunities. This provides a plausible explanation for potential variations in major identity across different academic years within the current sample. Heidari et al. (2023) further suggested that online social networks and online social capital facilitate the construction of professional identity, implying that contemporary students' major identity may be continuously shaped by digital learning environments alongside peer interactions. At

the same time, a systematic review by Ramadhani et al. (2026) indicated that academic procrastination is a common phenomenon among university students, typically occurring at a moderate prevalence rate. The moderate mean level of academic procrastination identified in this study is consistent with this general conclusion. Moreover, longitudinal research by Rahimi et al. (2023) demonstrated that procrastination exhibits a certain degree of stability alongside emotional fluctuations and stress experiences. Accordingly, even when students possess relatively strong major identity and self-control overall, academic procrastination may still emerge under conditions of high task demands or emotional pressure. This provides a realistic basis for subsequent examinations of the underlying mechanisms. Taken together, these findings indicate that undergraduates in private universities in Shaanxi Province possess a relatively positive foundation in terms of major identity and self-control, yet academic procrastination remains a prevalent issue. This suggests that, although students' learning behaviors are generally moving in a favorable direction, further enhancement of major identity and self-regulatory capacity is still necessary to optimize learning outcomes. From the perspective of Social Identity Theory (Tajfel & Turner, 1979), a higher level of identification with one's academic major strengthens the integration of self-concept and group identity, thereby facilitating the internalization of learning goals and promoting more proactive learning behaviors. This, to some extent, explains why both major identity and self-control are found to be at relatively high levels in this study. From the standpoint of Self-Control Theory (Gottfredson & Hirschi, 1990), self-control serves as a core mechanism through which individuals regulate impulses and delay gratification. It can effectively inhibit procrastination tendencies when individuals face academic task demands. However, when external pressures intensify or self-regulatory resources are depleted, the effectiveness of self-control may be constrained, leading to the intermittent occurrence of academic procrastination.

This study confirmed Hypothesis H2, which posited that major identity has a significant negative effect on academic procrastination among undergraduates in private universities in Shaanxi Province; that is, higher levels of major identity are associated with lower levels of academic procrastination. The regression results indicate that major identity significantly and negatively predicts academic procrastination, suggesting that when students more strongly identify with their chosen majors and develop a relatively stable professional identity, they are more likely to complete academic tasks in a more proactive manner, thereby reducing tendencies toward delay and avoidance. Liu et al. (2023) found among Chinese engineering undergraduates that major identity significantly promotes learning engagement and adaptive development. Increased learning engagement is often associated with stronger task execution and fewer procrastination behaviors, which aligns with the negative relationship observed in the present study. Li and Ren (2022) similarly noted that major identity influences university students' career orientations and learning attitudes; when students connect their major studies with future career development, their sense of meaning in learning tasks is enhanced, making them less prone to procrastination. Sparfeldt and Schwabe (2024) further demonstrated that procrastination mediates the relationship between personality traits and academic performance, indicating that procrastination serves as a critical behavioral pathway linking individual psychology and academic outcomes. This finding also supports the rationale for treating academic procrastination as a key outcome variable in the present study. Zaidi and Amjad (2026) emphasized that personality traits and procrastination jointly shape academic achievement, suggesting that the "identity-behavior" pathway may be influenced

by individual trait differences, thereby offering insights for future research to incorporate control or moderating variables. In addition, Xue et al. (2025) reported that academic stress can induce procrastination through maladaptive coping strategies. When considered in conjunction with the present findings, it can be inferred that students with higher levels of major identity may be more inclined to adopt adaptive coping strategies, enabling them to maintain lower levels of procrastination even under conditions of academic pressure. This inference provides empirical support for the discussion of the “protective effect” of major identity. From a theoretical perspective, these findings can be further explained through Social Identity Theory and Self-Control Theory. Social Identity Theory (Tajfel & Turner, 1979) posits that individuals’ identification with a group or social role is internalized into behavioral norms and value orientations. When students perceive their academic major as an integral part of their self-identity, they are more likely to develop a sense of responsibility and role-consistent behavioral expectations, thereby actively engaging in academic tasks and reducing avoidance behaviors. Meanwhile, Self-Control Theory (Gottfredson & Hirschi, 1990) emphasizes individuals’ capacity to regulate behavior when facing conflicts between immediate temptations and long-term goals. Students with higher major identity tend to have clearer academic goals and a stronger future orientation, which helps activate self-control resources and suppress procrastination impulses in academically demanding situations. Accordingly, major identity not only directly influences learning behaviors through social identity construction, but also indirectly reduces academic procrastination by strengthening students’ self-control capacity.

This study confirmed Hypothesis H3, which proposed that self-control mediates the relationship between major identity and academic procrastination. Specifically, major identity not only exerts a direct effect on academic procrastination but also indirectly reduces academic procrastination by enhancing students’ self-control capacity. The results of the Bootstrap mediation analysis indicate that the indirect effect of self-control is significant while the direct effect of major identity remains present, demonstrating a typical pattern of partial mediation. These findings suggest that major identity can suppress academic procrastination both directly and indirectly through the reinforcement of self-control resources. Consistent with the present findings, Li and Bai (2026) demonstrated in their study of online learning procrastination that self-control serves as a key mechanism through which achievement goal orientation influences procrastination, highlighting the bridging role of self-control between “motivation/identity” and behavioral execution. Rad et al. (2025) further reported that self-efficacy deficits and difficulties in emotion regulation predict higher levels of procrastination, indicating that procrastination is not merely a matter of time management but is closely tied to self-regulatory resources. This provides a strong psychological foundation for explaining procrastination mechanisms through self-control, as adopted in the present study. Yang et al. (2024) revealed a chain effect between self-control and learning engagement that is influenced by positive emotions and psychological resilience, suggesting that more complex psychological resource chains may underlie the mediation pathway identified in this study and offering directions for future research to expand toward multiple mediation models. Bönisch et al. (2026) provided evidence that beliefs can function as mechanisms of self-control, implying that the value beliefs and goal commitments fostered by major identity may reduce procrastination by strengthening self-control capacity. This serves as a meaningful theoretical complement to the present findings. Moreover, Wang (2025) verified the mediating role of self-control in research on smartphone addiction, further demonstrating

the cross-contextual explanatory power of self-control. Accordingly, intervention strategies proposed from a self-control perspective in the present study exhibit strong transferability and practical significance. From a theoretical standpoint, the mediating effect of self-control can be more systematically interpreted within an integrated framework of Social Identity Theory and Self-Control Theory. Social Identity Theory (Tajfel & Turner, 1979) posits that once individuals internalize a social role as a core component of their self-concept, they are more likely to conform to behavioral norms and value expectations consistent with that role. Such identity internalization provides a stable value foundation and directional guidance for self-control. Building on this premise, Self-Control Theory (Gottfredson & Hirschi, 1990) emphasizes the regulatory mechanisms through which internal goals are translated into actual behaviors. The sense of responsibility and long-term goal orientation activated by major identity effectively enhance the mobilization and maintenance of self-control resources, thereby suppressing impulses toward immediate gratification and procrastination in academic task contexts. In this way, major identity influences academic procrastination through the pathway of “identity internalization–self-control–behavior execution,” further underscoring the mediating function of self-control in the process by which major identity is transformed into concrete learning behaviors.

### **Conclusion**

Based on an empirical investigation of undergraduates in private universities in Shaanxi Province, this study systematically examined the relationships among major identity, self-control, and academic procrastination, and empirically verified the proposed research hypotheses. The findings indicate that undergraduates in private universities in Shaanxi Province generally exhibit moderately high levels of major identity and self-control, while academic procrastination remains at a moderate level. These results suggest that students possess a certain foundation in terms of learning motivation and behavioral regulation, although there is still considerable room for improvement. Further analyses revealed that major identity has a significant negative predictive effect on academic procrastination. Specifically, when students develop a stable and positive identification with their academic majors, their propensity for academic procrastination is significantly reduced. This finding underscores that major identity is not merely an attitudinal construct, but rather a critical psychological foundation shaping students’ learning behaviors and levels of academic engagement. In addition, the study confirmed the mediating role of self-control in the relationship between major identity and academic procrastination, thereby illuminating the internal mechanism through which major identity suppresses academic procrastination by enhancing students’ self-control capacity. From an integrated perspective of Social Identity Theory and Self-Control Theory, this study provides practical implications for higher education administrators and instructors by highlighting the importance of strengthening major identity cultivation and academic guidance to enhance students’ self-control, thereby reducing academic procrastination. It also offers a reference framework for university students to optimize their learning execution by fostering major identity and improving time management and self-regulation skills. Future research may incorporate emotional factors or learning environment variables (e.g., academic stress, peer support) into the model to further examine their moderating or mediating roles in the relationships among major identity, self-control, and academic procrastination.

## References

- Bönisch, F., König, T., Schweighofer-Kodritsch, S., & Weizsäcker, G. (2026). Beliefs as a means of self-control? Evidence from a dynamic student survey. *Journal of Economic Dynamics and Control*, 105279.
- Chansaengsee, S. (2025). The Effect of Field Independence on Self-Control and Self-Management Skills in Distance Education of Freshman College Students to the Strategy for ADHD Students. *Journal of Education and e-Learning Research*, 12(1), 52-63.
- Chen, X., Wu, M., Dong, G., Cui, L., Qu, B., & Zhu, Y. (2025). Social support and academic procrastination in health professions students: the serial mediating effect of intrinsic learning motivation and academic self-efficacy. *Advances in Health Sciences Education*, 30(4), 1143-1160.
- Geddani, R., Khanpara, P., Ghiria, H., & Patel, T. (2024). In the Educational Nexus: Understanding the Sequential Influence of Big Five Personality Traits, Major Identity, and Self-Esteem on Academic Outcomes through Clustering Algorithms. *Scalable Computing: Practice and Experience*, 25(6), 4477-4492.
- Gottfredson, M. R., & Hirschi, T. (1990). *A general theory of crime*. Stanford University Press.
- Heidari, E., Salimi, G., & Mehrvarz, M. (2023). The influence of online social networks and online social capital on constructing a new graduate students' professional identity. *Interactive Learning Environments*, 31(1), 214-231.
- Li, D., & Bai, H. (2026). The impact of achievement goal orientation on online academic procrastination among college students: exploring the roles of academic self-efficacy and self-control. *Journal of Research on Technology in Education*, 1-16.
- Li, H., & Ren, Z. (2022). Research on the Impact of College Students' Major Identity on Employment Tendency. *Literature and history*, 28, 15-91.
- Liu, X., Ji, X., Zhang, Y., & Gao, W. (2023). Professional identity and career adaptability among Chinese engineering students: the mediating role of learning engagement. *Behavioral Sciences*, 13(6), 480.
- Rad, H. F., Bordbar, S., Bahmaei, J., Vejdani, M., & Yusefi, A. R. (2025). Predicting academic procrastination of students based on academic self-efficacy and emotional regulation difficulties. *Scientific Reports*, 15(1), 3003.
- Rahimi, S., Hall, N. C., & Sticca, F. (2023). Understanding academic procrastination: A longitudinal analysis of procrastination and emotions in undergraduate and graduate students. *Motivation and Emotion*, 47(4), 554-574.
- Ramadhani, E., Setiyosari, P., Indreswari, H., Setiyowati, A. J., & Putri, R. D. (2026). Academic procrastination: A systematic review of causal factors and interventions. *Journal of Behavioral and Cognitive Therapy*, 36(1), 100552.
- Rodríguez-Ruiz, J., Marín-López, I., & Espejo-Siles, R. (2025). Is artificial intelligence use related to self-control, self-esteem and self-efficacy among university students?. *Education and Information Technologies*, 30(2), 2507-2524.
- Sparfeldt, J. R., & Schwabe, S. (2024). Academic procrastination mediates the relation between conscientiousness and academic achievement. *Personality and individual differences*, 218, 112466.
- Tajfel, H., & Turner, J. C. (1979). *An integrative theory of intergroup conflict*. In W. G. Austin & S. Worchel (Eds.), *The social psychology of intergroup relations* (pp. 33-47). Monterey, CA: Brooks/Cole.
- Tannous, C., Chien, H. W., Kenny, B., Lin, K. H., Everett, B., Yeh, J. Y., ... & Salamonson, Y. (2024). Factors influencing career choice, study experiences and professional identity in

- undergraduate health students: A mixed methods study across two universities. *Teaching and Learning in Nursing, 19*(3), 249-259.
- Tao, X., Hanif, H., & Lieqin, W. (2025). The effects of self-regulated learning strategies on academic procrastination and academic success among college EFL students in China. *Frontiers in Psychology, 16*, 1562980.
- Vabo, G., Slettebø, Å., & Fossum, M. (2022). Nursing students' professional identity development: an integrative review. *Nordic Journal of Nursing Research, 42*(2), 62-75.
- Wang, F. (2025). Effects of physical activity on mobile phone addiction among university students: the mediating roles of self-control and resilience. *Frontiers in Psychology, 16*, 1503607.
- Wang, H., Liu, Y., Wang, Z., & Wang, T. (2023). The influences of the Big Five personality traits on academic achievements: Chain mediating effect based on major identity and self-efficacy. *Frontiers in psychology, 14*, 1065554.
- Xue, C., Helian, Z., & Li, Y. (2025). Academic pressure and academic procrastination: The mediating role of negative coping strategies. *Plos one, 20*(12), e0338956.
- Yang, Y. D., Zhou, C. L., & Wang, Z. Q. (2024). The relationship between self-control and learning engagement among Chinese college students: the chain mediating roles of resilience and positive emotions. *Frontiers in Psychology, 15*, 1331691.
- Zaidi, S. M. I. H., & Amjad, M. (2026). The Struggle Behind Success: How Personality Traits and Procrastination Shape Academic Achievement. *Social Science Review Archives, 4*(1), 611-626.
- Zhang, J., Peng, C., & Chen, C. (2024). Mental health and academic performance of college students: Knowledge in the field of mental health, self-control, and learning in college. *Acta Psychologica, 248*, 104351.