

The Influence of Emptiness on Academic Procrastination Among College Students: The Mediating Role of Academic Delay of Gratification

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Abstract: This study aims to explore how emptiness influences academic procrastination in college students and to clarify the mediating mechanism of academic delay of gratification. A questionnaire survey was conducted among 305 university students using standardized measurement tools, and the collected data were analyzed via SPSS 26.0 and the PROCESS macro. The results indicate that both emptiness and academic procrastination among participants are significantly higher than the theoretical mean, with significant differences observed across certain demographic variables. Emptiness is significantly negatively correlated with academic delay of gratification and strongly positively correlated with academic procrastination. After controlling for demographic factors, academic delay of gratification plays a significant masking role in the association between emptiness and academic procrastination. Specifically, emptiness not only directly and positively predicts academic procrastination but also indirectly aggravates it by weakening students' ability to delay gratification in academic contexts. This study provides practical implications for universities to design interventions against academic procrastination and improves mental health education.

Keywords: College Students; Emptiness; Academic Procrastination; Academic Delay of Gratification; Mediating Effect.

1. Introduction

1.1. Research Background

With the popularization of higher education in China, the issues of mental health and academic development of college students have attracted increasing attention. At present, some college students are faced with dilemmas such as lack of goals, interest and a sense of value, and their psychological needs have not been met for a long time, thus experiencing emptiness frequently. Survey data from Professor Xu Kaiwen of Peking University shows that 30.4% of college students have the experience of emptiness. Emptiness may not only affect the physical and mental health of college students, but also have a potential negative impact on their academic performance [1, 2]

As key variables affecting college students' academic achievement, academic delay of gratification and academic procrastination have become research hotspots in the field of educational psychology in recent years. Relevant studies have shown that 39.7% of college students in China have obvious academic procrastination, and this phenomenon has no significant differences among different majors, regions and types of colleges and universities[1]. Academic procrastination not only leads to the decline of academic performance, but also may induce emotional disorders such as anxiety and depression, and form individuals' negative cognition of themselves, which seriously threatens the academic development and mental health of college students [2].

Based on the above background, this study hypothesizes that emptiness may indirectly affect academic procrastination behavior by influencing college students' ability of academic delay of gratification.

1.2. Research Review

1.2.1. Concept Definition and Variable Relationships

Emptiness represents a negative emotional state arising from an individual's deficit in perceived value, life direction, and behavioral significance, frequently accompanied by maladaptive coping strategies such as overeating or excessive internet use[3]. Although direct investigations into the link between emptiness and academic procrastination remain scarce, their potential association can be inferred through indirect findings. Frankl(1962), within his Logotherapy framework, suggested that emptiness drives individuals towards compensatory actions like oversleeping or internet addiction as a means to mitigate negative affect; such behaviors encroach upon study time and undermine academic focus, potentially triggering procrastination. Furthermore, the diminished sense of worth inherent in emptiness may reduce students' motivation to engage with academic tasks, making them more susceptible to the lure of immediate gratification and thereby amplifying procrastinatory tendencies[4]. Drawing upon the self-regulated learning paradigm, Bembenutty and Karabenick (1998) introduced the construct of academic delay of gratification, characterizing it as "students' inclination to forgo immediate rewards in pursuit of longer-term academic objectives[5]." Zu Y T and Lu H D(2015) elaborated on this, emphasizing that academic delay of gratification fundamentally represents self-regulatory capacity within educational settings, directly influencing individuals' persistence and execution in academic endeavors, and serving as a critical determinant of scholastic success. While no studies have directly examined the emptiness-delay of gratification link, evidence confirms a significant negative association between emptiness and general self-control. Research indicates that university students reporting higher levels of emptiness tend to exhibit weaker self-control abilities[6].

Given that academic delay of gratification is conceptualized as a form of self-control, it is plausible that emptiness might diminish this specific academic self-regulatory capacity.

Academic procrastination refers to learners' deliberate postponement of initiating or completing tasks despite clear expectations regarding academic requirements[7]. The detrimental effects of academic procrastination are far-reaching; it not only hampers learning efficiency and academic attainment but also perpetuates a detrimental cycle—"procrastination leads to negative emotions, which in turn exacerbate procrastination"—by invoking feelings of anxiety and self-doubt(Cormack S H, Eagle L A, Davies M S,2020)[8].

A substantial body of empirical work supports the inverse relationship between academic delay of gratification and academic procrastination. Studies demonstrate that students with a heightened capacity for academic delay of gratification report lower levels of procrastination. This is attributed to their enhanced ability to prioritize long-term goals over immediate temptations through effective self-regulation, thus avoiding procrastinatory choices.

Academic delay of gratification appears to directly curtail procrastinatory behavior by bolstering task-related initiative and stands as a significant mediating variable linking psychological states with academic conduct.

1.2.2. Research Commentary

Existing studies have provided a rich foundation for understanding the influencing factors of college students' academic procrastination, but there are still two deficiencies: first, the research perspective is limited, focusing more on external factors such as time management and task characteristics or individual traits such as low sense of responsibility and high impulsivity, while paying insufficient attention to negative psychological states without a sense of goal such as "emptiness", and ignoring its potential impact on academic behavior; second, the discussion on the mechanism is not in-depth enough. Although some studies have mentioned the correlation between self-control and academic procrastination, they have not focused on "academic delay of gratification", a specific self-regulation ability in academic scenarios, and cannot clarify the specific path of emptiness affecting academic procrastination[9]

1.3. Research Objectives and Hypotheses

1.3.1. Research Objectives

The primary goal of this investigation is to systematically examine the interrelations among emptiness, academic delay of gratification, and academic procrastination in university students. The core objectives are twofold: first, to ascertain the direct impact of emptiness on academic procrastination; second, to assess the mediating function of academic delay of gratification in this relationship, thereby illuminating the indirect pathway "emptiness → academic delay of gratification → academic procrastination." This will furnish a theoretical foundation and practical guidance for mitigating academic procrastination among university students [10]

1.3.2. Research Hypotheses

Grounded in the theoretical analysis and literature review presented above, the following hypotheses are advanced:

H1: College students' emptiness positively predicts academic procrastination, that is, the higher the level of emptiness, the more serious the degree of academic procrastination;

H2: Academic delay of gratification mediates the relationship between emptiness and academic procrastination. That is, emptiness indirectly exacerbates academic procrastination by diminishing the capacity for academic delay of gratification. A diagram of the proposed research model is provided below.

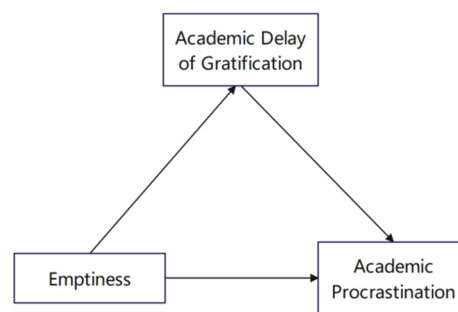


Fig 1. A diagram of the proposed research model

2. Research Methods

2.1. Theoretical Basis of the Research

This study takes the self-regulated learning theory as the core framework. The self-regulated learning theory holds that individuals' academic behavior is regulated by self-regulation ability. As the core self-regulation ability in academic scenarios, academic delay of gratification can affect the execution and completion of academic tasks by balancing long-term goals and instant temptations; while emptiness, as a negative psychological state, may damage the self-regulation system, reduce the ability of academic delay of gratification, and thus trigger academic procrastination[11].

2.2. Research Subjects

A convenient sampling method was adopted to select about 300 college students from colleges and universities as research subjects. The sampling process avoided the exam week (Weeks 5 to 8 were selected) to exclude the interference of exam pressure on the scores of academic procrastination and emptiness. A total of 310 questionnaires were distributed, and after data cleaning (excluding questionnaires with response time < 5 minutes or > 30 minutes, regular answers and missing key information), 305 valid questionnaires were finally obtained, with an effective recovery rate of 98%. The demographic characteristics of the sample are as follows: in terms of gender, 154 males (50.49%) and 151 females (49.51%); in terms of grade, 42 freshmen (13.77%), 142 sophomores (46.56%), 98 juniors (32.13%) and 23 seniors (7.54%); in terms of major, 119 liberal arts students (39.02%), 147 science students (48.2%) and 39 students of other majors (12.79%).

2.3. Research Tools

2.3.1. Subjective Emptiness Scale

A well-established scale was utilized to quantify the level of emptiness among participants. Developed by Price, Mahler, and Hopwood, this instrument comprises 5 items rated on a 4-point Likert scale(1=completely disagree, 4=completely agree). Higher cumulative scores denote a more intense experience of emptiness. The scale demonstrates sound psychometric properties, with a Cronbach's coefficient of 0.90, a split-half reliability of 0.84, and a two-week test-retest reliability of 0.82, confirming its suitability for use with university student populations.

2.3.2. Academic Delay of Gratification Scale (ADOGS)

The revised version by Liu L H (2010) was selected, which was translated and revised from Bembenutty's Academic Delay of Gratification Scale. It adopts a 4-point scoring system (1 = totally inclined to instant gratification, 4 = totally inclined to delayed gratification), with a higher total score representing a stronger ability of academic delay of gratification. The revised scale has a Cronbach's α coefficient of 0.85, and exploratory factor analysis shows good construct validity, making it a commonly used tool for measuring college students' academic delay of gratification in China.

2.3.3. College Students' Academic Procrastination Scale

The scale developed in Han G N's (2008) master's thesis was adopted. This instrument contains 37 items rated on a 5-point Likert scale (1 = never procrastinate, 5 = always procrastinate). Higher total scores indicate more severe academic procrastination. The scale possesses excellent reliability and validity, with a reported Cronbach's α coefficient of 0.8671 and a criterion validity of 0.940, and its utility has been corroborated across multiple studies[12].

2.4. Data Collection and Analysis Methods

An online questionnaire survey method was adopted, and questionnaires were distributed through the "Questionnaire

Star" platform. Before the survey, the subjects were informed of the research purpose, anonymity principle and response requirements, and the subjects filled in and submitted the questionnaires voluntarily. The data collection cycle was 2 weeks, with a total of 310 questionnaires recovered, and 305 valid questionnaires were retained after screening. SPSS 26.0 software and the PROCESS plug-in were used for data analysis. The main analysis methods included descriptive statistics, correlation analysis, and the test of mediating effect based on the principle of hierarchical regression.

3. Results and Analysis

3.1. Overall Situation of College Students' Academic Procrastination

The score range of college students' academic procrastination was 27-135, with a total mean score of 93.05. In the three dimensions, the mean score of homework completion was 34.53, the mean score of review for exams was 34.26, and the mean score of autonomous learning was 24.27. The mean scores of homework completion, review for exams and autonomous learning were all higher than the corresponding theoretical means, as shown in Table 1.

Table 1. Mean and Standard Deviation of College Students' Academic Procrastination

Variable	Mean of Academic Procrastination	Homework Completion	Review for Exams	Autonomous Learning
$\bar{x}$	93.05	34.53	34.26	24.27
s	19.92	7.25	8.16	5.42
Theoretical Total Mean	81	30	30	21

3.2. Overall Characteristics of College Students' Subjective Emptiness

A one-sample t-test was used in this study, to compare the scores of the Subjective Emptiness Scale with the theoretical mean (12.5). The results showed that the sample mean was 13.18, which was significantly higher than the theoretical mean ($t(304)=2.900$, $p=0.004$), and the 95% confidence interval of the difference was [0.22, 1.14], which did not include 0, further verifying the significance of the difference,

as shown in Table 2 and Table 3.

Table 2. Mean and Standard Deviation of College Students' Subjective Emptiness

Variable	Mean of Subjective Emptiness
$\bar{x}$	13.18
s	4.10
Theoretical Total Mean	12.5

Table 3. One-sample Test of College Students' Subjective Emptiness

	t	Degrees of Freedom	Significance (Two-tailed)	Mean Difference	95% Confidence Interval of Difference	
					Upper Limit	Lower Limit
Subjective Emptiness	2.90	304	0.004	0.68	1.14	0.22

3.3. Demographic Difference Analysis of College Students' Subjective Emptiness, Academic Delay of Gratification and Academic Procrastination

Independent-samples t-tests, and one-way analyses of variance (ANOVA) were performed to examine variations in the study variables across demographic categories. Key findings are as follows: Regarding gender, male participants reported significantly higher levels of subjective emptiness compared to females, whereas females demonstrated significantly higher levels of academic delay of gratification. No significant gender difference emerged for academic procrastination. Concerning academic major, significant differences were observed in both academic delay of gratification and subjective emptiness. With respect to year of

study, first-year students scored significantly higher on both subjective emptiness and academic procrastination than students in other years. A comprehensive summary of these results is provided in Table 4 [13].

3.4. Correlation Analysis of College Students' Subjective Emptiness, Academic Delay of Gratification and Academic Procrastination

Pearson correlation analysis revealed significant correlations among the three variables. Specifically: subjective emptiness was significantly negatively correlated with academic delay of gratification ($r = -0.178$, $p < 0.01$); subjective emptiness was strongly positively correlated with academic procrastination ($r = 0.741$, $p < 0.001$)

3.5. Hypothesis Testing

To test the mediating role of academic delay of gratification, PROCESS macro (Model 4) was used with gender, major, and grade as control variables.

Regression results showed that after controlling for covariates, subjective emptiness significantly negatively predicted academic delay of gratification ($\beta = -0.0886, SE = 0.0342, t = -2.5941, p = 0.010, 95\% CI = [-0.1559, -0.0214]$), and academic delay of gratification significantly negatively predicted academic procrastination ($\beta = -1.0679, SE = 0.3236, t = -3.3007, p = 0.001, 95\% CI = [0.4312, 1.7047]$). Meanwhile, both the total effect ($\beta = 3.7044, SE = 0.1946, t = 19.0330, p < 0.001, 95\% CI = [3.3214, 4.0874]$) and direct effect ($\beta = 3.7990, SE = 0.1936, t = 19.6199, p < 0.001, 95\% CI = [3.4180, 4.1801]$) of emptiness on academic procrastination were significantly positive. Bootstrap sampling (5000 iterations) showed that the indirect effect of academic delay of gratification was -0.0947 , with a $95\% CI [-0.2081, -0.0093]$ not containing 0, indicating a significant mediating effect.

Table 4. Demographic Differences of Each Variable ($\bar{x} \pm s$)

Variable	Subjective Emptiness	Academic Delay of Gratification	Academic Procrastination
Male	13.95±3.60***	7.33±2.47*	94.57±19.76
Female	12.40±4.42	7.87±2.30	91.50±20.02
t	3.21	-2.10	1.32
Science	13.25±3.78	7.49±2.41	91.51±19.78
Liberal Arts	13.08±4.22	6.74±2.29*	100.65±20.35**
Others	12.96±3.89	7.56±2.36	93.59±19.90
F	18.56***	3.24*	5.89**
Freshman	13.51±4.10*	7.80±2.35	98.50±20.50*
Sophomore	12.76±3.65	7.92±2.30	90.12±19.65
Junior	12.68±3.55	8.01±2.28	89.33±19.48
Senior	13.12±3.82	7.77±2.26	92.66±20.11
F	21.34***	4.56**	3.89*

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

Overall, because the indirect effect ($\beta = -0.0947$) and direct effect ($\beta = 3.7990$) have opposite signs, and the direct effect is larger than the total effect, academic delay of gratification plays a masking effect rather than a traditional partial mediating role.

4. Discussion

4.1. The Direct Influence of Subjective Emptiness on Academic Procrastination

This study verified the direct predictive effect of subjective emptiness on academic procrastination: when college students experience a strong sense of subjective emptiness, they tend to avoid realistic pressure and fill the inner emptiness through procrastination behavior. The significance of this direct effect suggests that alleviating college students' subjective emptiness is an important starting point for reducing academic procrastination in intervention practice.

4.2. The Mediating Mechanism of Academic Delay of Gratification

This study found that academic delay of gratification has a significant masking effect between emptiness and academic procrastination, which is a typical masking type with opposite signs for indirect and direct effects.

Statistically, the direct effect of emptiness on academic

procrastination is significantly positive ($\beta = 0.542, p < 0.001$), meaning emptiness directly predicts more procrastination. However, the indirect effect via academic delay of gratification is significantly negative (effect = -0.0947). This sign difference makes the total effect (0.447) smaller than the direct effect, meaning academic delay of gratification “masks” part of the real impact of emptiness on procrastination.

Theoretically, this masking effect can be explained as follows: emptiness exacerbates academic procrastination by weakening students' academic delay of gratification (emptiness $\uparrow \rightarrow$ academic delay of gratification $\downarrow \rightarrow$ academic procrastination $\uparrow$). However, in regression, academic delay of gratification negatively predicts procrastination ($\beta = -1.0679$), resulting in a negative indirect effect that offsets the positive direct effect.

This finding indicates that academic delay of gratification is a key potential pathway linking emptiness to academic procrastination. While emptiness directly promotes procrastination, low academic delay of gratification acts as an “amplifier” that worsens emptiness-driven procrastination. Previous studies mostly focused on the protective role of delay of gratification; this study supplements existing literature by revealing that insufficient academic delay of gratification becomes a risk factor for procrastination under the influence of emptiness.

5. Limitations and Prospects

This study has several limitations. First, sampling bias: convenience sampling was used, and participants were mainly from one region with an unbalanced distribution of liberal arts and science students, making it hard to generalize the results to all Chinese college students. Second, cross-sectional design: this cross-sectional study can only examine correlations and mediation, not causal relationships. Future research may adopt a longitudinal design to track the dynamic changes of emptiness, academic delay of gratification, and academic procrastination. Third, insufficient analysis of the masking effect: this study only identified the masking effect but did not explore its moderators (e.g., gender, grade). Future studies may add moderating variables to build a moderated mediation model and deepen the conclusions.

This study clarifies the mediating role of academic delay of gratification in the relationship between subjective emptiness and academic procrastination, and provides a theoretical basis and practical direction for the intervention of college students' academic procrastination. In the intervention process, in addition to paying attention to the alleviation of subjective emptiness, we should also focus on cultivating college students' ability of academic delay of gratification, helping them establish long-term academic goals, and improving their willingness and ability to delay instant gratification for the realization of goals. In carrying out relevant work, we can start from two aspects: on the one hand, alleviate college students' subjective emptiness through psychological counseling and other methods; on the other hand, improve their ability of academic delay of gratification through curriculum design, group activities and other ways, so as to reduce academic procrastination behavior more effectively.

References

- [1] Price, A. L., Mahler, H., & Hopwood, C. (2019). Subjective emptiness: A clinically significant trans-diagnostic psychopathology construct. *Journal of Consulting and Clinical Psychology*, 87(1), 65–77. <https://doi.org/10.1037/ccp0000371>.

- [2] Pang, W. G., & Han, G. N. (2009). A study on the current situation and causes of academic procrastination of college students in China. *Tsinghua Journal of Education*, 30, 59–65, 94. (In Chinese)
- [3] Rice, K. G., Richardson, C. M. E., & Clark, D. (2012). Perfectionism, procrastination, and psychological distress. *Journal of Consulting and Clinical Psychology*, 80(2), 288–302. <https://doi.org/10.1037/a0027118>.
- [4] Liang, F. (2013). A study on the relationship between emptiness, coping styles and school adaptation of college students [Master's thesis]. Southwest University. (In Chinese)
- [5] Frank, V. E. (1962). *Man's search for meaning: An introduction to logotherapy*. Beacon Press.
- [6] Bembenutty, H., & Karabenick, S. A. (1998). Academic delay of gratification. *Learning and Individual Differences*, 10(4), 329–346. [https://doi.org/10.1016/S1041-6080\(99\)80003-5](https://doi.org/10.1016/S1041-6080(99)80003-5).
- [7] Zu, Y. T., & Lu, H. D. (2015). Academic delay of gratification: Characteristics and cultivation. *Journal of Northeast Normal University (Philosophy and Social Sciences Edition)*, (1), 58–61. (In Chinese)
- [8] Gao, X. Q., Liu, C., Gao, G., et al. (2020). The influence of college students' emptiness on mobile phone addiction: The mediating role of self-control. *Chinese Journal of Health Psychology*, 28(10), 1548–1552. (In Chinese)
- [9] Li, Y. H., Huo, Z. Z., Wang, X. K., et al. (2021). Development of the Academic Procrastination Scale for primary school students. *Chinese Journal of Clinical Psychology*, 29(5), 931–936. (In Chinese)
- [10] Cormack, S. H., Eagle, L. A., & Davies, M. S. (2020). A large-scale test of the relationship between procrastination and performance using learning analytics. *Assessment & Evaluation in Higher Education*, 45(7), 1046–1059. <https://doi.org/10.1080/02602938.2019.1700929>.
- [11] Ruan, K. (2019). The influence of college students' mobile phone addiction on academic procrastination: The mediating role of academic delay of gratification. *Health Research*, 39(4), 369–373. (In Chinese)
- [12] Zhang, Y. X. (2012). A study on the relationship among time perspective, academic delay of gratification and academic procrastination of college students [Master's thesis]. Northwest Normal University. (In Chinese)
- [13] Zimmerman, B. J. (2000). Attaining self-regulation: A social cognitive perspective. In M. Boekaerts & P. R. Pintrich (Eds.), *Handbook of self-regulation* (pp. 13–39). Academic Press.