

Modeling the Path from Academic Pressure to Internet Gaming Disorder in Accounting Students: A SEM Analysis of Burnout and Self-Esteem

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Abstract

Internet Gaming Disorder (IGD) has emerged as a pressing concern among college students, with academic pressure increasingly recognized as a critical contributing factor. However, the psychological mechanisms underlying this relationship remain insufficiently understood. This study investigates the impact of academic pressure on IGD among Chinese university students majoring in accounting, focusing on the mediating role of student burnout and the moderating role of self-esteem. A sample of 510 accounting students completed standardized assessments, including the Maslach Burnout Inventory-Student Survey (MBI-SS), Perceived Learning Stress Scale (PLSS), Rosenberg Self-Esteem Scale (SES), and the Nine-Item Internet Gaming Disorder Scale (IGDS9-SF). Results indicated that academic pressure was positively associated with IGD, and this relationship was significantly mediated by student burnout. Moreover, self-esteem served as a negative moderator, attenuating the effect of academic pressure on burnout. These findings support a moderated mediation model and highlight that high academic demands indirectly promote IGD by intensifying student burnout, while self-esteem acts as a protective psychological resource. This study contributes to the understanding of IGD's etiology in the context of academic stress and provides a theoretical basis for developing targeted interventions to support students in high-pressure academic disciplines.

Keywords

Internet Gaming Disorder, Academic Pressure, Student Burnout, Self-Esteem, Accounting Students.

1. Introduction

In recent years, Internet Gaming Disorder (IGD) has become an increasingly prominent concern among university students, particularly those in academically demanding majors. As digital games evolve into highly immersive platforms offering instant gratification, a growing number of students are engaging excessively in online gaming, leading to disruptions in their academic performance, emotional regulation, and overall well-being. Among these students, those majoring in accounting often face uniquely intense academic pressures due to the rigorous

nature of their coursework, frequent assessments, and future professional certification requirements.

Academic pressure, a common yet potent stressor in university life, has been identified as a key contributor to various maladaptive behaviors. When students are unable to effectively manage overwhelming academic demands, they may experience negative emotional states such as anxiety, frustration, and hopelessness. In such contexts, online games become an accessible and seemingly effective means of emotional escape and coping. The structured design of games-offering clear goals, immediate feedback, and a sense of control-contrasts sharply with the ambiguity and delayed rewards associated with academic achievement. Consequently, gaming becomes not only a form of entertainment but also a psychological refuge from academic stress. However, not all students respond to academic pressure in the same way. The development of IGD is often influenced by internal psychological processes, particularly student burnout-a state of emotional exhaustion, cynicism, and reduced academic efficacy. Burnout may serve as a bridge linking academic stress to problematic gaming behaviors. Furthermore, individual differences such as self-esteem may shape how students perceive and respond to academic challenges. Students with higher self-esteem tend to adopt more adaptive coping strategies and are less likely to experience severe burnout, whereas those with lower self-esteem may internalize failure and be more prone to emotional disengagement and avoidance behaviors, including excessive gaming.

Despite the growing attention to IGD in the general college population, few studies have examined how this disorder develops within specific academic disciplines. This study focuses on accounting majors to explore how academic pressure contributes to IGD, through the mediating role of student burnout and the moderating effect of self-esteem. By integrating discipline-specific stressors into a broader psychological framework, the study seeks to uncover the underlying mechanisms of IGD formation, offering both theoretical insights and practical guidance for targeted interventions within higher education.

This study makes several key contributions to the literature on Internet Gaming Disorder and academic psychology:

Discipline-Specific Focus: It targets accounting majors-a group often overlooked in IGD research-highlighting how their unique academic stress profile influences digital addiction patterns.

Integrated Psychological Model: By introducing a moderated mediation model, the study bridges external stressors (academic pressure) and internal responses (burnout, self-esteem), offering a more comprehensive understanding of IGD development.

Clarification of Mechanisms: It empirically tests the mediating role of student burnout and the moderating role of self-esteem, revealing how and under what conditions academic stress escalates into IGD.

Practical Implications: The findings offer actionable insights for universities and educators seeking to design tailored psychological interventions for high-risk student groups in demanding academic programs.

Theoretical Enrichment: This research extends existing stress-coping and self-regulation theories by applying them to the digital behavior domain, particularly IGD, within the academic context.

2. Methodology

2.1. Participants and Procedures

A total of 510 full-time undergraduate students were recruited from 15 universities across China's mainland. All participants majored in accounting. The questionnaire was delivered

online through WeChat and QQ, which are the two most used social media platforms in China. Two participants (0.39%) were removed due to self-reported non-gaming status. Twelve (2.35%) were excluded due to invalid responses (response time < 100 seconds). As a result, 496 valid questionnaires were included. There are 208 males and 288 females all between 18 and 24 years old ($M = 19.48$, $SD = 1.28$). They reported an average of 3.02 hours ($SD = 2.18$) per day playing online games. The study protocol was approved by the Ethics Committee. Informed consent was presented prior to the formal questionnaire.

2.2. Measures

2.2.1. The Nine-Item Internet Gaming Disorder Scale

The Nine-Item Internet Gaming Disorder Scale (IGDS9-SF) is a commonly used self-administered screen tool for IGD symptoms [1]. It was designed on the basis of the diagnostic criteria of IGD in the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders. Nine items are scored on a 5-point Likert scale (1 = never, 5 = always), with a total score ranging from 9 to 45 points. Average scores of the scales were calculated, with higher scores indicating a higher degree of IGD. The Cronbach's Alpha coefficient is 0.74, demonstrating a good reliability and effectiveness in assessing an individual's degree of IGD.

2.2.2. Perceived Learning Stress Survey

The learners' perception of study pressure was measured using the Perceived Learning Stress Survey [2], a 14-item scale developed by Lazarevic and Bentz (2021) [3]. It contains two sub-dimensions: the sense of tension and the sense of loss in learning situations. The total score ranges from 0 to 56, with a higher score indicating a higher level of study pressure. An excellent internal consistency was obtained for the items ($\alpha = 0.73$).

2.2.3. Maslach Burnout Inventory-Student Survey

The Maslach Burnout Inventory-Student Survey (MBI-SS [4]) is a student-adapted version of the original MBI [4]. Fifteen items are constructed to assess student burnout, including 5 items for Exhaustion ($\alpha = 0.89$), 4 items for Cynicism ($\alpha = 0.82$), and 6 items for Academic Efficacy ($\alpha = 0.78$). Respondents used a 7-point Likert scale (0=never, 6=always). It should be noted that the Professional Efficacy subscale adopts reverse scoring (marked as rEF, and when scoring). The MBI-SS scores range from 0 to 90, with a higher score indicating a higher level of student burnout.

2.2.4. Self-Esteem Scale

The Self-Esteem Scale (SES) is a widely used measurement for self-esteem [5]. It consists of 10 items, and a possible score range is 10 to 50; a higher score indicates a higher level of self-esteem. The SES achieved a Cronbach's Alpha coefficient of 0.82.

2.3. Data Analysis

In this study, SPSS 27.0 statistical software was used for data processing. The Harman single-factor test was carried out to implement a common method bias test on the data. Descriptive statistical analysis and Pearson correlation analysis were performed to explore the basic characteristics of each variable and their interrelationships [6]. The SPSS PROCESS macro program was employed to examine the mediation effect of student burnout between academic pressure and IGD, and the moderating effect of self-esteem on the mediating role of student burnout. The significance of the mediation and moderating effects were assessed by Bootstrap sampling (with samplings repeated 5,000 times). Furthermore, the outcomes were validated by estimating 95% bias-corrected bootstrap confidence intervals (CIs).

3. Results

3.1. The Common Method Bias Test

The results of Harman's single-factor test demonstrated that there were altogether 8 factors with eigenvalues exceeding 1, and the maximum variance explanatory rare reached 31.32%, below the critical threshold of 40%. It is demonstrated that no severe common method bias was present in this research.

3.2. Correlation Analysis of Academic Pressure, Student Burnout, Self-esteem, and IGD

The means and standard deviations, and correlation matrix for each variable are shown in Table 1. The Results of the correlation analysis indicated that academic pressure was positively correlated with student burnout ($r = 0.67$, $p < 0.001$) and IGD ($r = 0.47$, $p < 0.001$). There was a significantly positive correlation between students' student burnout and IGD ($r = 0.45$, $p < 0.001$), while there was a significantly negative correlation between students' student burnout and self-esteem ($r = -0.61$, $p < 0.001$). In addition, self-esteem presented a significantly negative correlation with academic pressure ($r = -0.34$, $p < 0.001$).

Table 1. Results of correlation analysis between variables.

Variables	M±SD	1	2	3	4
1. Student burnout	2.61±1.06	1			
2. Academic pressure	2.82±0.48	0.671***	1		
3. Self-esteem	2.80±0.50	-0.607***	-0.342***	1	
4. Internet gaming disorder	2.39±0.93	0.445***	0.469***	-0.279***	1

Note: $n = 496$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

3.3. The Relations between Academic Pressure and Internet Gaming Disorder: A Regulatory Model for Mediation Effect

Based on the mediation effect analysis approaches proposed by Hayes (2013) and Wen and Ye (2014), Model 4 and Model 7 in the SPSS macro program PROCESS were used for testing. The results, which are shown in Figure 1, demonstrated that academic pressure had a positive prediction on IGD directly ($\beta = 0.31$, $SE = 0.10$, $p < 0.01$). The academic pressure had a significantly indirect effect on IGD via student burnout (Academic Pressure $\rightarrow$ Student Burnout $\beta = 0.67$, $SE = 0.07$, $p < 0.01$) (Student Burnout $\rightarrow$ IGD $\beta = 0.24$, $SE = 0.05$).

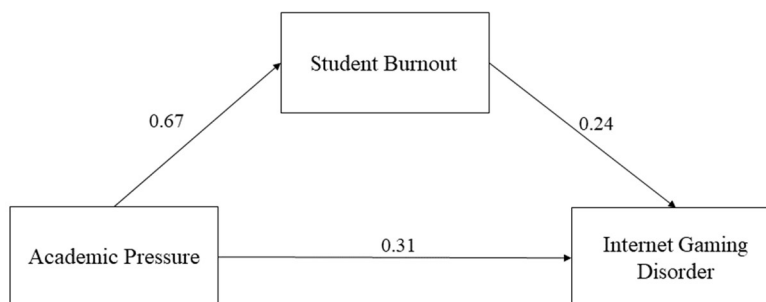


Figure 1. Model path coefficient diagram (a).

As shown in Table 2, the direct effect of academic pressure on IGD was significant (Direct effect 95%CI = [0.40,0.80]), accounting for 65.93% of the total effect. The indirect relationship of academic pressure and IGD via student burnout was significant (Indirect effect 95%CI = [0.18,0.45]), accounting for 34.07% of the total effect. Thus, hypothesis 1 and 2 was supported.

Table 2. Total, direct, and indirect effects.

	Effect value	SE	LLCI/ULCI		Relative value
			LLCI	ULCI	
Total effect	0.91	0.08	0.76	1.06	
Direct effect	0.60	0.10	0.40	0.80	65.93%
Indirect effect	0.31	0.07	0.18	0.45	34.07%

Note: SE standard error; LLCI lower limit of confidence interval; ULCI upper limit of confidence interval.

It demonstrated that academic pressure had a significant positive effect on IGD ($t = 5.87$, $p < 0.001$), which satisfied the preconditions for the moderating mediation effect test (condition a). The academic pressure positively predicted the student burnout level ($t = 17.30$, $p < 0.001$), and the student burnout exhibited a significantly positive effect on IGD ($t = 4.53$, $p < 0.001$), meeting the path condition for the mediation effect test (condition b). Based on the control of the main effect, moderating variables were introduced to construct the interaction effect model of academic pressure and self-esteem. Results showed that the main effect of academic pressure on student burnout remained significant, and that the interaction term between academic pressure and self-esteem reached a statistically significant level ($\beta = -0.13$, $t = -5.31$, $p < 0.001$), revealing that self-esteem played a negative moderating role between academic pressure and student burnout (condition c). So far, as Figure 2 shows, the three necessary conditions for the mediation effect have been fulfilled.

In addition, the variance inflation factors of all predictor variables in this study are not higher than 2.6, indicating that there is no problem with multicollinearity.

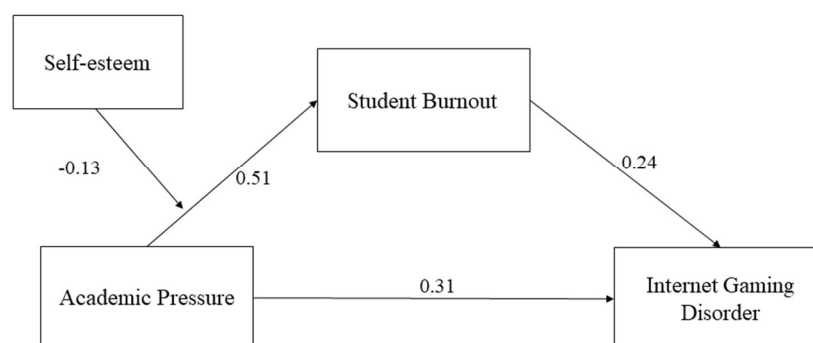


Figure 2. Model path coefficient diagram (b).

To further analyze the impact of self-esteem acting as a moderator between academic pressure and IGD, self-esteem was classified into high-level and low-level according to the mean $\pm$ 1SD. There was a significant difference between indirect effects across different self-esteem levels (Index of moderated mediation = -0.03 , BootSE = 0.01 , 95%CI = $[-0.05, -0.01]$): the low self-esteem group (M – 1SD) demonstrated an indirect effect value of 0.29 (BootSE = 0.07 , 95%CI

= [0.17, 0.44]), while the high self-esteem group ($M + 1SD$) demonstrated an indirect effect value of 0.18 (BootSE= 0.04, 95%CI = [0.10, 0.27]). As Figure 3 illustrates, compared with individuals with high-level self-esteem, the predictive effect of academic pressure on IGD was significantly stronger for individuals with low-level self-esteem, with the regulatory effect explaining $\Delta R^2 = 0.02$ ($p < 0.01$).

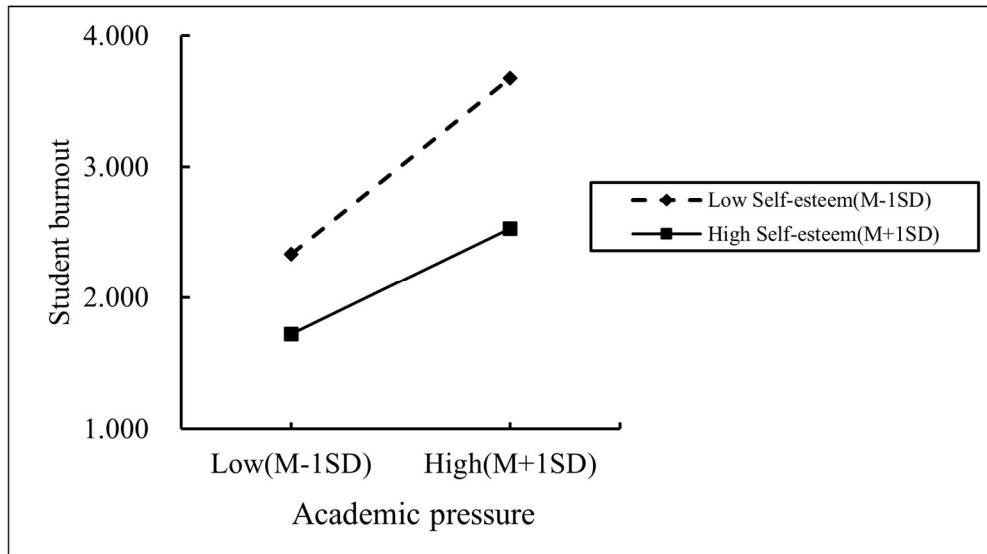


Figure 3. Self-esteem as a moderator of the relationship between academic pressure and student burnout.

Table 3. Moderation analyses.

Variables	Equation 1			Equation 2		
	(Outcome variable: Internet gaming disorder)			(Outcome variable: Student burnout)		
	SE	β	t	SE	β	t
Student burnout	0.05	0.21***	4.53	/	/	/
Academic pressure	0.10	0.60***	5.87	0.07	-0.51***	17.3
Self-esteem	/	/	/	0.06	-0.41***	-14.19
Student burnout $\times$ Self-esteem	/	/	/	0.31	-0.13***	5.31
R ²	0.25			0.63		
F	82.52***			283.09***		

Note: * $p < 0.05$. ** $p < 0.01$. *** $p < 0.001$.

4. Conclusion and Future Work

This study has provided a comprehensive analysis of the relationship between academic pressure and Internet Gaming Disorder (IGD) among accounting majors, focusing on the mediating role of student burnout and the moderating role of self-esteem [7]. The findings indicate that academic pressure significantly contributes to the development of IGD, with

student burnout acting as a key mediator in this relationship [8]. High academic pressure leads to burnout, which in turn increases the likelihood of students turning to online gaming as a coping mechanism. Furthermore, self-esteem was found to moderate the effect of academic pressure on student burnout, with students having lower self-esteem being more susceptible to experiencing burnout under academic pressure, which then escalates the risk of IGD [9]. In contrast, students with higher self-esteem exhibit greater psychological resilience, reducing their vulnerability to burnout and, consequently, to IGD. These insights underscore the importance of addressing both the academic demands placed on students and their psychological well-being in efforts to prevent IGD. The study emphasizes the need for strategies to lower academic pressure, enhance self-esteem, and provide students with better coping mechanisms to reduce their risk of developing IGD.

While this study provides valuable insights into the mechanisms linking academic pressure, student burnout, and IGD, several avenues remain for future research:

Longitudinal Studies: Future research should adopt longitudinal designs to explore the temporal relationships between academic pressure, burnout, and IGD. This would allow for a better understanding of the causal pathways and how these factors evolve over time.

Cross-Disciplinary Comparisons: This study focused specifically on accounting majors, but future research could investigate the role of academic pressure in other disciplines. A cross-disciplinary comparison could reveal whether the academic pressure-IGD relationship differs across fields with distinct stress profiles.

Intervention Programs: Further studies could explore the effectiveness of targeted intervention programs designed to reduce academic pressure and enhance self-esteem. Research should evaluate the impact of such interventions on reducing IGD symptoms among students in high-pressure academic programs [10].

Examining Different Game Genres: As different genres of online games provide distinct forms of psychological gratification, future research could examine how game genre affects the development of IGD. It would be valuable to explore whether certain types of games (e.g., role-playing games vs. competitive games) are more strongly associated with academic stress and burnout.

Cultural and Contextual Variations: Given the cultural and contextual factors that shape students' experiences of academic pressure, future studies should investigate how IGD manifests in different cultural contexts or countries. This would provide a more comprehensive understanding of the global nature of IGD and its relationship to academic stress.

References

- [1] Ali A M, Al-Amer R, Atout M, et al. The nine-item Internet Gaming Disorder Scale (IGDS9-SF): Its psychometric properties among Sri Lankan students and measurement invariance across Sri Lanka, Turkey, Australia, and the USA[C]//Healthcare. MDPI, 2022, 10(3): 490.
- [2] Cohen S, Kamarck T, Mermelstein R. A global measure of perceived stress[J]. Journal of health and social behavior, 1983: 385-396.
- [3] Lazarevic B, Bentz D. Student perception of stress in online and face-to-face learning: the exploration of stress determinants[J]. American Journal of Distance Education, 2021, 35(1): 2-15.
- [4] Schaufeli W B, Salanova M, González-Romá V, et al. The measurement of engagement and burnout: A two sample confirmatory factor analytic approach[J]. Journal of Happiness studies, 2002, 3: 71-92.
- [5] Rosenberg M. Rosenberg self-esteem scale (RSE)[J]. Acceptance and commitment therapy. Measures package, 1965, 61(52): 18.

- [6] Luo Y, Wang Z, Zhang H, et al. The effect of perfectionism on school burnout among adolescence: The mediator of self-esteem and coping style[J]. *Personality and Individual Differences*, 2016, 88: 202-208.
- [7] Xi W, Hu Y Z. Research status and prospect of adolescent online game addiction[J]. *Chin Appl Psychol*, 2022, 28(1): 3-19.
- [8] Zhang M, Chi C, Liu Q, et al. Prevalence of smartphone addiction and its relation with psychological distress and internet gaming disorder among medical college students[J]. *Frontiers in public health*, 2024, 12: 1362121.
- [9] Zhu Z G, Zhang D J, Wu J H, et al. The Relationship Between Psychological Suzhi and Academic Burnout: the Mediating Role of Self-Esteem[J]. *Journal of Southwest University (Natural Science Edition)*, 2018, 40(10): 58-64.
- [10] Van Royen A, Wante L, Braet C. The role of early maladaptive schemas in late adolescents suffering from school burnout and depressive symptoms[J]. *Journal of Affective Disorders Reports*, 2024, 17: 100815.