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ARTICLE

The Relationship between Relative Deprivation and Generative AI Dependency among College Students: A Variable-Centered and Person-Centered Approach

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ABSTRACT: Backgrounds: As an increasing number of college students rely on Generative Artificial Intelligence (Gen AI) in academic work and social interaction, concerns about its potential negative effects have emerged. This study aims to address this gap by examining the relationship between relative deprivation and Gen AI dependency among college students. **Methods:** This study included 1583 college students. Four validated instruments were employed: the Relative Deprivation Scale, Psychological Entitlement Scale, Self-Handicapping Scale, and Artificial Intelligence Chatbot Dependence Scale. Bivariate correlation analysis, Structural Equation Modeling (SEM) for testing mediation, Latent Profile Analysis (LPA), and Analysis of Variance (ANOVA) were conducted. **Results:** Research has found a significant association between relative deprivation and Gen AI dependency. Psychological entitlement and self-handicapping each showed significant indirect effects, with effect sizes of 0.044 and 0.146, respectively. Additionally, the serial indirect effect of these two factors was significant, with an indirect effect of 0.028. LPA based on relative deprivation and Gen AI dependency identified three profiles: the low, moderate, and high co-occurrence levels. Students in different profiles exhibited statistically significant differences in their traits. **Conclusions:** This study uses variable- and person-centered analyses to examine the association between relative deprivation and Gen AI dependency, as well as related associations with psychological entitlement and self-handicapping. It provides initial theoretical support for rational Gen AI use.

KEYWORDS: Relative deprivation; psychological entitlement; self-handicapping; generative AI dependency; college students

1 Introduction

In recent years, the rapid development of Generative Artificial Intelligence (Gen AI) has transformed it from a tool-based aid into an essential part of daily life [1]. Recent studies suggest that China is among the leading countries in Gen AI adoption, with college students as the main driving force behind this trend [2–4]. College students are experiencing a crucial transitional period in their personal development as they move from campus life into society. During this stage, their curiosity to explore new experiences is powerful [5]. Generally, college students demonstrate an openness to new technologies, showing high

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levels of acceptance and adaptability [4]. Gen AI, with its powerful information processing abilities, instant interactivity, and personalized services, addresses the diverse needs of college students in academics, social interactions, and psychological well-being, making it highly appealing to them [1,3]. However, such tools are a double-edged sword, and concerns about their potential negative impacts are growing, particularly the risks associated with excessive dependency on Gen AI [6,7]. Gen AI dependency is defined as a persistent pattern of excessive psychological and behavioral reliance on Gen AI tools across academic settings and daily social interactions. Although this is an emerging construct with measurement predominantly relying on validated self-report instruments, preliminary empirical evidence indicates that heightened Gen AI dependency is associated with addictive behavioral patterns and functional impairments in both academic performance and interpersonal relationships [3,8]. Studies have shown that a dependence on Gen AI may trigger academic misconduct and privacy risks [4,9]. Furthermore, excessive dependency on Gen AI among college students may diminish their autonomous decision-making abilities and critical judgment, potentially leading to academic procrastination and reduced learning efficiency [4]. Moreover, it may also trigger psychological problems, such as a diminished sense of belonging, which further undermines mental well-being and increases the risk of anxiety and depression [10]. To address these issues, urgent efforts are necessary. Given the urgency of this issue and the characteristics of vulnerable populations, it is essential to empirically investigate the psychological factors underlying this phenomenon.

Grounded in the compensatory online use theory and the I-PACE model [11,12], this study examines the association between relative deprivation and college students' Gen AI dependency, and tests whether psychological entitlement and self-handicapping mediate this relationship. This study carries both theoretical and practical values. Theoretically, this study extends the compensatory online use paradigm from traditional internet addiction to the Gen AI context, highlighting relative deprivation as a crucial social stressor in the emerging technological environment [13–15]. Furthermore, it applies the I-PACE model to explain how stable cognitive characteristics (psychological entitlement) are linked to behavioral regulation patterns (self-handicapping) in the context of problematic Gen AI engagement [12]. Additionally, integrating variable-centered and person-centered approaches is intended to identify distinct level-based profiles of relative deprivation and Gen AI dependency among college students. From a practical perspective, as Gen AI becomes more integrated into students' academic and social lives, concerns about the potential risks of over-reliance and maladaptive use are increasing [1,3,6]. This investigation aims to provide empirical evidence for college mental health counseling and psychological development strategies, offering targeted guidance for future research on problematic Gen AI use.

1.1 Relative Deprivation and Generative AI Dependency

Relative deprivation is a subjective cognitive and emotional experience in which individuals or groups feel disadvantaged when making comparisons to reference points [16]. College students are in a critical period of emotional development and live in highly stratified peer-group environments. They are susceptible to social comparison, which makes them more vulnerable to feelings of relative deprivation [17]. The compensatory online use theory suggests that individuals who feel a strong sense of relative deprivation are more likely to become addicted to the internet [11,17,18]. Additionally, they may draw on their successful online experiences to compensate for the emotional pain associated with real-life failures, ultimately addressing the unmet psychological needs that arise from feelings of relative deprivation [13–15]. Notably, internet addiction and Gen AI dependency exhibit similar behavioral mechanisms, as both utilize digital media to address psychological deficits in reality [6]. This similarity also aligns with the I-PACE model, which indicates that all addictive behaviors share similar developmental processes and mechanisms [12].

Moreover, Gen AI outperforms traditional digital technologies by dynamically adapting in real time to meet user needs and significantly enhancing individual engagement. When users experience relative deprivation, Gen AI's anthropomorphic features allow it to sense its emotions and provide support through active listening, empathetic responses, and ongoing companionship [19]. In contrast, traditional internet technologies often rely on fixed rules and standardized content, lacking the dynamic adaptability that Gen AI provides [20]. As an advanced form of digital technology, Gen AI can alleviate feelings of deprivation and frustration, while also fostering users' reliance on such tools. This study proposes H1: Relative deprivation is positively associated with Gen AI dependency.

1.2 The Mediating Role of Psychological Entitlement

Psychological entitlement is defined as an individual's stable and pervasive subjective belief that they deserve preferential treatment and are even exempt from social responsibilities [21]. Existing research has consistently found a significant positive correlation between relative deprivation and psychological entitlement, and this psychological mechanism appears to be common across different social classes and groups [22]. According to social comparison theory [23], when individuals compare their resources, status, and opportunities with those of others, they tend to assess their own gains and losses. When they perceive themselves to be at a disadvantage or feel that their rewards do not align with their efforts, they tend to experience relative deprivation [24]. This is characterized by feelings of injustice, resentment, and personal disadvantage. From the perspective of equity theory, once individuals view resource allocation as unfair, they are likely to attribute their disadvantaged position to external factors rather than internal shortcomings [25]. Consequently, individuals may believe they are entitled to compensation and deserve preferential treatment. Prolonged perceptions of injustice can heighten psychological entitlement and consolidate this stable dispositional tendency [21]. This entitlement can manifest as an expectation of special treatment, a diminished sense of social responsibility, and the belief that one is inherently entitled to greater access to advantageous resources [22]. Moreover, longitudinal studies further confirm that relative deprivation is significantly positively associated with psychological entitlement [26].

According to the compensatory online use theory, psychological entitlement is also associated with internet addiction [13,27]. Individuals who feel psychologically entitled often prefer convenient and low-cost ways to meet their personal needs [28]. The internet's instant feedback and minimal constraints align well with this preference, which is closely associated with problematic internet use [27]. Drawing on the I-PACE model [12], we can infer that this pattern may also apply to Gen AI. While traditional internet provides a degree of compensatory satisfaction, Gen AI offers an environment that uniquely accommodates entitlement fulfillment: Gen AI possesses anthropomorphic features that enable it to provide instant responses, offer positive attention, and listen attentively. These fulfill users' need for unconditional acceptance without reciprocal obligations [19]. Additionally, its anonymity enables users to express their needs, including unconventional demands, without facing social or moral constraints [29]. Consequently, highly entitled individuals may turn to Gen AI as a readily available source to satisfy their psychological entitlement. Thus, the present study proposes H2: Psychological entitlement mediates the association between relative deprivation and Gen AI dependency.

1.3 The Mediating Role of Self-Handicapping

Self-handicapping is a defensive strategy in which individuals deliberately create obstacles before completing a task to protect their self-worth from failure threats [30]. Self-determination theory posits that relative deprivation is correlated with greater anxiety and heightened threats to self-worth [31], and is

often linked to the use of defensive strategies [14]. Empirical studies indicate a positive correlation between relative deprivation and self-handicapping [32,33]. Thus, when individuals experience relative deprivation, they may resort to self-handicapping strategies to protect their self-esteem. Moreover, prior research indicates that long-term self-handicapping is closely related to dependent and maladaptive behavioral patterns [34]. A variety of studies have found a positive correlation between self-handicapping and smartphone addiction [35,36]. Based on the I-PACE model [12], this self-protective strategy can also be applied to the use of Gen AI. Individuals may use Gen AI as a self-handicapping tool: they attribute poor performance to Gen AI's limitations while highlighting personal contributions to success, even when relying on it, resulting in a mutual self-protection effect [35]. Additionally, Gen AI's capability to customize content delivery based on users' preferences, behaviors, and contextual factors may make it an effective tool for self-handicapping [19]. Thus, we propose H3: Self-handicapping mediates the association between relative deprivation and Gen AI dependency.

1.4 The Serial Mediation Roles of Psychological Entitlement and Self-Handicapping

We also hypothesize that psychological entitlement and self-handicapping serve as serial mediators between relative deprivation and Gen AI dependency. Individuals with a strong sense of psychological entitlement often view themselves as special and form unrealistic expectations for success and attention. This mindset makes it difficult for them to accept failure, as it threatens their sense of superiority and uniqueness, resulting in cognitive dissonance [28]. According to cognitive dissonance theory, individuals may adopt defensive strategies to resolve the internal conflict caused by the fear of failure [37]. For example, high psychological entitlement individuals exhibit a significant self-serving bias in their attribution patterns, they often attribute their positive outcomes to their own efforts while blaming others for negative outcomes [38]. Moreover, they are more sensitive to others' evaluations and are likely to interpret neutral situations as personal threats [21]. Besides, indirect academic evidence also supports this. Previous research has found that demanding rights, a narcissistic trait highly associated with psychological entitlement, significantly correlates with self-handicapping tendencies [39]. One empirical study demonstrated that college students with high academic entitlement tend to externalize responsibility for performance, avoid effort, and attribute failure to external factors rather than internal deficits [40]. Based on this, we propose H4: Psychological entitlement and self-handicapping play a serial mediating role in the relationship between relative deprivation and Gen AI dependency.

1.5 Variable-Centered and Person-Centered Approaches to Relative Deprivation, Psychological Entitlement, Self-Handicapping and Gen AI Dependency

Prior studies exploring the relationship between relative deprivation and internet addiction have predominantly adopted variable-centered methods, such as linear regression or structural equation modeling [14,15]. However, these methods focus on commonalities across samples, which may limit the generalizability of the research findings. This limitation occurs because they often overlook potential patterns that vary with different levels of relative deprivation (e.g., low versus high deprivation) and the diverse dependency patterns associated with Gen AI (e.g., instrumental versus addictive dependence). For example, a related longitudinal study found a contradictory result: relative deprivation was not significantly associated with long-term social media use [41]. In contrast, a person-centered approach recognizes the diversity within the population and, when combined with variable-centered methods, can provide more comprehensive and nuanced insights.

In recent years, studies have employed both variable-centered and person-centered methods to explore psychological and behavioral phenomena, including interpersonal interaction and internet addiction [42,43]. Nevertheless, research employing person-centered approaches alone or in combination with variable-centered methods remains scarce in the field of Gen AI. In fact, examining the association between relative deprivation and Gen AI dependency helps illustrate the link between college students' negative psychological states and their digital behaviors. These digital behaviors are closely connected to important factors such as mental health in the digital age and effective technology use [3,10]. Therefore, clarifying the intrinsic relationship between relative deprivation and Gen AI dependency holds crucial theoretical and practical value for gaining a deeper understanding of the psychological development patterns and digital behavior models of contemporary college students.

Thus, this study aims to identify latent profiles characterized by different levels of relative deprivation and Gen AI dependency, and to examine differences in crucial psychological factors (i.e., psychological entitlement, self-handicapping) across these profiles. It aims to explore preliminary directions for reducing excessive reliance on Gen AI and mitigating the negative consequences of inappropriate Gen AI dependency and excessive relative deprivation. Given the limited research on relative deprivation and Gen AI dependency, and the unclear roles of psychological entitlement and self-handicapping, no specific latent profiles were hypothesized.

2 Methods

2.1 Participants

Our sample was recruited via convenience sampling, consisting of 1627 full-time undergraduate students from Jiangxi Province, China. Data were collected using paper-based questionnaires in October 2025. Ultimately, we collected 1583 valid questionnaires (Mean age = 20.22, SD = 1.26, 47.8% male) after excluding careless and patterned responses, with an overall response rate of 97.3%. Of these, 561 students (35.4%) were freshman undergraduates, 597 students (37.7%) were sophomore undergraduates, 194 students (12.3%) were junior undergraduates, and 231 students (14.6%) were senior undergraduates. The study was approved by the Institutional Review Board (IRB) of Jiangxi Normal University (Ethics Approval No. IRB-JXNU-PSY-2025038). Informed consent was obtained from each participant.

2.2 Measures

2.2.1 Relative Deprivation

Relative deprivation was measured by 4 items of the Relative Deprivation Questionnaire [44]. The scale was developed in Chinese, and responses are rated on a 6-point scale ranging from 1 (strongly disagree) to 6 (strongly agree). The scale has demonstrated good reliability and validity in Chinese samples [45]. An example question is: "Given all the effort and sacrifice I have put in, my life should be better than it is now". All scores were aggregated into a mean score, with higher scores indicating higher relative deprivation. The Cronbach's α coefficient in this study was 0.884, indicating acceptable reliability. The confirmatory factor analysis showed that the construct validity was acceptable (χ^2(df) = 16.346(2), RMSEA = 0.067, SRMR = 0.011, CFI = 0.996, and TLI = 0.989).

2.2.2 Psychological Entitlement

Psychological entitlement was measured by 9 items of the Chinese Version of the Psychological Entitlement Scale [21,46]. Responses are rated on a 7-point scale, ranging from 1 (strongly disagree) to

7 (strongly agree). The scale has demonstrated good reliability and validity in Chinese samples [47]. An example question is: "I really feel I deserve more praise than others". All scores were aggregated into a mean score, with higher scores indicating high psychological entitlement. The Cronbach's α coefficient in this study was 0.930, indicating acceptable reliability. During confirmatory factor analysis, two pairs of error correlations were added to address method effects (such as overlapping item content), guided by modification indices and substantive theoretical justification [48,49]. The results supported acceptable construct validity (χ^2(df) = 237.643(25), RMSEA = 0.073, SRMR = 0.027, CFI = 0.952, and TLI = 0.931).

2.2.3 Self-Handicapping

Self-handicapping was measured using 14 items from the Chinese Version of the Self-handicapping Scale [50,51]. Responses are rated on a 7-point scale ranging from 1 (strongly disagree) to 7 (strongly agree). The scale has demonstrated good reliability and validity in Chinese samples [52]. An example question is: "When I make mistakes, I always blame them on unfavorable circumstances". All scores were aggregated into a mean score, with higher scores indicating high self-handicapping. The Cronbach's α coefficient in this study was 0.885, indicating acceptable reliability. During confirmatory factor analysis, two pairs of error correlations were added to address method effects (such as overlapping item content), guided by modification indices and substantive theoretical justification [48,49]. The results supported acceptable construct validity (χ^2(df) = 734.407(75), RMSEA = 0.075, SRMR = 0.069, CFI = 0.908, and TLI = 0.900).

2.2.4 Generative AI Dependency

Gen AI dependency was measured by 8 items of the Artificial Intelligence Chatbot Dependence Scale, which has demonstrated good reliability and validity in Chinese samples [53]. This scale was specifically developed to assess dependence on conversational AI programs based on large language models (e.g., ChatGPT, DeepSeek, Tongyi Qianwen), which are the predominant form of Gen AI applications. The scale was developed in Chinese, and responses are rated on a 6-point scale ranging from 1 (strongly disagree) to 6 (strongly agree). An example question is: "If unable to use AI chatbots, I would feel anxious or uncomfortable". All scores were aggregated into a mean score, with higher scores indicating high Gen AI dependency. The Cronbach's α coefficient in this study was 0.954, indicating acceptable reliability. During confirmatory factor analysis, two pairs of error correlations were added to address method effects (such as overlapping item content), guided by modification indices and substantive theoretical justification [48,49]. The results supported acceptable construct validity (χ^2(df) = 183.187(18), RMSEA = 0.076, SRMR = 0.026, CFI = 0.959, and TLI = 0.937).

2.2.5 Statistical Analysis

In the variable-centered study, a preliminary analysis was conducted using descriptive statistics and Pearson correlations to assess the feasibility of further analysis with SPSS 27.0 (IBM Corp., Armonk, NY, USA). The mediating roles of psychological entitlement and self-handicapping were examined using Mplus 7.0 (Muthén & Muthén, Los Angeles, CA, USA) via structural equation modeling (SEM). The Relative Deprivation Scale, Psychological Entitlement Scale and AI Dependence Scale were analyzed as unidimensional constructs. For the Self-Handicapping Scale, its Chinese version is widely adopted as a single factor in domestic research [50,54,55], so we also treated it as unidimensional. Accordingly, we conducted item parceling to optimize the overall model fit, reduce random error and ensure accurate mediation effect tests [56,57]. First, a factor analysis was performed on all items for each scale, and items were ranked by factor loading from highest to lowest. Subsequently, items were assigned to different parcels through an alternating

high–low distribution approach. Specifically, the Psychological Entitlement Scale was parceled into three item groups, the Self-handicapping Scale into four item groups, and the Gen AI Dependency Scale into three item groups. Given the limited number of items in the Relative Deprivation Scale, its original four items were directly incorporated into the model for analysis. Additionally, since previous research has shown that participants' gender, age, and grade may influence the usage of Gen AI [58,59], these demographic variables were included as control variables in subsequent analysis. This person-centered study used Mplus 7.0 to conduct a latent profile analysis (LPA) with relative deprivation and Gen AI dependency as explicit variables. Additionally, ANOVAs were conducted to compare the differences in psychological entitlement and self-handicapping across profiles of relative deprivation and Gen AI dependency.

Additionally, to assess common-method bias in questionnaire-based investigations, the Harman single-factor test was applied. This test revealed that an unrotated principal component analysis yielded 6 factors with eigenvalues greater than 1. The first factor explained 36.5% of the variance, falling below the 40% critical threshold [60], suggesting no significant common method variance. The CFA indicates that the one-factor model fits the data poorly (χ^2(df) = 20,818.99(560), CFI = 0.501, TLI = 0.470, SRMR = 0.139, and RMSEA = 0.151). These suggest that common method bias is unlikely to have a large impact on our findings.

3 Results

3.1 Preliminary Analysis

Descriptive statistics and correlations are reported in Table 1. The mean of relative deprivation was 3.005 (SD = 0.932), of psychological entitlement was 4.204 (SD = 1.070), of self-handicapping was 2.837 (SD = 0.560), and of Gen AI dependency was 3.040 (SD = 1.211). Gen AI dependency was positively correlated with relative deprivation (r = 0.535, $p < 0.01$), psychological entitlement (r = 0.362, $p < 0.01$), and self-handicapping (r = 0.508, $p < 0.01$), self-handicapping was positively correlated with relative deprivation (r = 0.547, $p < 0.01$), psychological entitlement (r = 0.408, $p < 0.01$), psychological entitlement was positively correlated with relative deprivation (r = 0.444, $p < 0.01$).

Table 1: Descriptive statistics and correlations among variables (N = 1583).

Variables	Mean	SD	1	2	3	4	5	6	7
1. Gender	1.520	0.500	1						
2. Age	20.220	1.261	−0.297**	1					
3. Grade	2.060	1.028	−0.253**	0.813**	1				
4. Relative deprivation	3.005	0.932	−0.201**	0.131**	0.112**	1			
5. Psychological entitlement	4.204	1.070	0.113**	−0.001	0.047	0.444**	1		
6. Self-handicapping	2.837	0.560	−0.048	0.027	0.015	0.547**	0.408**	1	
7. Gen AI dependency	3.040	1.211	−0.140**	0.039	0.026	0.535**	0.362**	0.508**	1

Notes: **$p < 0.01$; SD: Standard Deviation; Gender: 1 = Male, 2 = Female; Grade: 1 = Freshman, 2 = Sophomore, 3 = Junior, 4 = Senior.

3.2 Mediation Analyses: Variable-Centered Approach

An analysis of the chained mediation model was conducted, and the results are presented in Fig. 1. The model fit indices were as follows: χ^2(df) = 1000.539(101), RMSEA = 0.075, SRMR = 0.054, CFI = 0.952, and TLI = 0.937, indicating an acceptable model fit [61]. After controlling for gender, age, and grade, the findings indicated that relative deprivation was significantly and positively associated with psychological entitlement (β = 0.483, t = 17.201, $p < 0.001$), self-handicapping (β = 0.512, t = 15.256, $p < 0.001$), and Gen AI dependency (β = 0.385, t = 9.939, $p < 0.001$). Moreover, psychological entitlement was significantly and positively correlated with self-handicapping (β = 0.201, t = 6.250, $p < 0.001$) and Gen AI dependency (β = 0.092,

t = 3.201, $p < 0.01$). Furthermore, self-handicapping was also significantly and positively associated with Gen AI dependency (β = 0.285, t = 8.148, $p < 0.001$).

Mediating effects were examined using the bias-corrected percentile Bootstrap procedure with 5000 bootstrap samples (See Table 2 and Fig. 1). The direct effect of relative deprivation on Gen AI dependency (β = 0.385, SE = 0.039, $p < 0.001$, 95% CI [0.321, 0.448]) was evidenced to be significant. In addition, the total indirect effect was significant (β = 0.218, SE = 0.026, $p < 0.001$, 95% CI [0.175, 0.261]). Psychological entitlement showed a significant indirect effect in the association between relative deprivation and Gen AI dependency (β = 0.044, SE = 0.014, $p < 0.01$, 95% CI [0.022, 0.067]), supporting Hypothesis 2. Moreover, self-handicapping showed a significant indirect effect (β = 0.146, SE = 0.020, $p < 0.001$, 95% CI [0.113, 0.179]), consistent with Hypothesis 3. Furthermore, the sequential indirect effect involving both psychological entitlement and self-handicapping was significant (β = 0.028, SE = 0.006, $p < 0.001$, 95% CI [0.018, 0.038]).

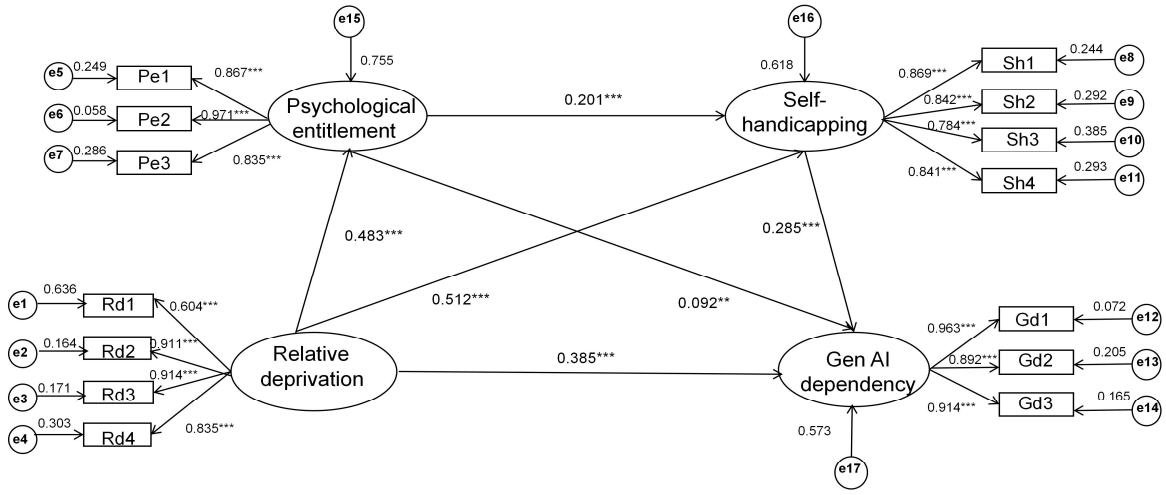

Figure 1: Chain mediation model. $^{**}p < 0.01$; $^{***}p < 0.001$; Rd means relative deprivation, Pe means psychological entitlement, Sh means self-handicapping, Gd means Gen AI dependency. All path coefficients are standardized coefficients after controlling for gender, age and grade.

Table 2: Analysis of path standardized coefficients.

Effects and Paths	Effect	SE	Boot LLCI	Boot ULCI	*p*-Value
Direct effect: relative deprivation → Gen AI dependency	0.385	0.039	0.321	0.448	<0.001
Total indirect	0.218	0.026	0.175	0.261	<0.001
Ind1 relative deprivation → psychological entitlement → Gen AI dependency	0.044	0.014	0.022	0.067	<0.01
Ind2 relative deprivation → self-handicapping → Gen AI dependency	0.146	0.020	0.113	0.179	<0.001
Ind3 relative deprivation → psychological entitlement → self-handicapping → Gen AI dependency	0.028	0.006	0.018	0.038	<0.001

Notes: LLCI: Lower Limit of the 95% confidence interval; ULCI: Upper Limit of the 95% confidence interval.

3.3 Latent Profile Identification: A Person-Centered Approach

This study conducted LPA using scores from relative deprivation and Gen AI dependency as explicit variables. The results indicated that, beginning with a one-class model and progressively increasing the

number of profiles from 1 to 5, the fit indices for each model are presented in Table 3. The values of AIC, BIC, aBIC, and Entropy are significantly lower for the 3-profile solutions than for 1 or 2 profile solutions (VLMR-LRT $p < 0.01$, BLRT $p < 0.001$). Furthermore, when the number of profiles increased to 4 and 5, the smallest group accounted for only 3.4% of the total sample, which is below the commonly used threshold of 5%. This suggests that this small subgroup is unstable and not representative of the general population. Specifically, the small sample size of the minor group may fail to reflect the population's actual characteristics [54]. In summary, the three-profile solution was chosen for its clear representation of different score levels and its strong explanatory power. Specifically (see Fig. 2), Class 1 exhibited relatively high scores of both relative deprivation and Gen AI dependency, so it was labeled the high co-occurrence level (N = 121, 7.6%). Class 2 reported moderate levels, close to the overall average, on both variables, and was thus named the moderate co-occurrence level (N = 753, 47.3%). By contrast, Class 3 showed relatively low scores on relative deprivation and Gen AI dependency and was categorized as the low co-occurrence level (N = 709, 45.1%).

Table 3: Model fit statistics for latent profile analysis and corresponding profile probabilities.

Number of Classes	AIC	BIC	aBIC	Entropy	*p*-Value (VLMR-LRT)	*p*-Value (BLRT)	Profile Probability (%)
Class 1	63,326.291	63,455.100	63,378.857	-	-	-	-
Class 2	55,418.394	55,616.976	55,499.435	0.924	<0.001	<0.001	56.6%, 43.4%
Class 3	52,486.689	52,755.043	52,596.204	0.956	<0.01	<0.001	47.3%, 45.1%, 7.6%
Class 4	50,776.346	51,104.472	50,904.334	0.939	<0.001	<0.001	35.8%, 32.2%, 28.6%, 3.4%
Class 5	49,850.847	50,258.745	50,017.309	0.940	<0.001	<0.001	10.6%, 30.5%, 24.3%, 31.2%, 3.4%

Notes: AIC means Akaike Information Criterion, BIC means Bayesian information criterion. aBIC means adjusted Bayesian information criterion, VLMR-LRT means Vuong-lo-mendell-rubin likelihood ratio test, BLRT means bootstrap likelihood ratio test.

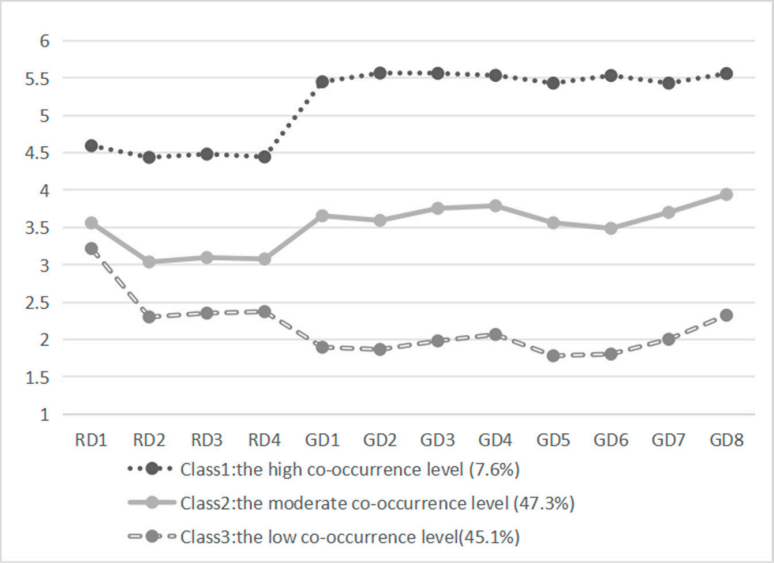

Figure 2: Latent profile analysis of relative deprivation and Gen AI dependency. RD means relative deprivation, and GD means Gen AI dependency.

3.4 Latent Profile Comparison: Person-Centered Approach

The three profiles were hypothesized to be statistically distinct from one another. To verify and compare the differences in psychological entitlement and self-handicapping across the profiles of relative deprivation and Gen AI dependency, ANOVAs were conducted. The statistics are presented in Table 4. The ANOVA results supported the hypothesis regarding distinctions between the profiles. As illustrated in Table 4, the differences in psychological entitlement (F = 121.85, $p < 0.001$) and self-handicapping (F = 240.98, $p < 0.001$) were statistically significant.

Table 4: Means of variables and ANOVA across profiles of relative deprivation and Gen AI dependency.

	C1 N=121 7.6%	**C2 N=753 47.3%**	**C3 N=709 45.1%**	**F**	**Partial η^2**	**Post Hoc Tests**
Variable	Mean (SD)	Mean (SD)	Mean (SD)	-	-	-
Relative deprivation	4.47 (1.05)	3.19 (0.71)	2.56 (0.79)	349.52***	0.31	1 > 2 > 3
Psychological entitlement	5.44 (0.99)	4.27 (0.90)	3.93 (1.09)	121.85***	0.13	1 > 2 > 3
Self-handicapping	3.64 (0.78)	2.92 (0.41)	2.63 (0.51)	240.98***	0.23	1 > 2 > 3
Gen AI dependency	5.45 (0.92)	3.68 (0.49)	1.96 (0.54)	2970.19***	0.79	1 > 2 > 3

Notes: ***$p < 0.001$. SD: Standard Deviation.

4 Discussion

This study utilized both variable-centered and person-centered approaches to explore the relationship between relative deprivation and dependency on Gen AI among college students. The results found that relative deprivation was significantly positively associated with Gen AI dependency. Both psychological entitlement and self-handicapping exerted significant statistical mediating effects on the relationship between relative deprivation and Gen AI dependency. Additionally, the serial indirect effect of these two variables was also significant. The person-centered analysis yielded three profiles differing primarily in level and magnitude of relative deprivation and Gen AI dependency. Additionally, significant differences in students' perceptions of psychological entitlement and self-handicapping were observed across these profiles. These findings offer a more integrated and nuanced view of the relationships between relative deprivation and Gen AI dependency among college students.

4.1 The Relationship between Relative Deprivation and Generative AI Dependency among College Students: Variable-Centered Perspective

The current study showed that relative deprivation was significantly positively associated with Gen AI dependency, consistent with H1. This trend is consistent with previous relevant studies, suggesting that relative deprivation is associated with individuals' deviant online behaviors [13–15]. College students are at a critical stage of personality development, and they reside in stratified, clustered communities [5,12]. Raised in an examination-oriented education system, these students exhibit a strong tendency toward social comparison, leading them to choose more successful peer groups as reference points for evaluating their own abilities [17]. However, this inclination can also make them susceptible to relative deprivation [45]. This sense of deprivation correlates with lower satisfaction of fundamental psychological needs, such as autonomy and competence [31]. According to the compensatory online use theory, individuals often seek alternative channels for compensation when they struggle to meet their real-world needs [11]. Gen AI, with its anthropomorphic features, is associated with perceived need fulfillment among these students [6]. These findings further support the applicability of the compensatory internet model in the field of Gen AI.

4.2 The Mediating Role of Psychological Entitlement: Variable-Centered Perspective

This study found a significant indirect effect of psychological entitlement on the association between relative deprivation and Gen AI dependency, supporting Hypothesis 2. This also aligns with previous relevant research [17,26]. In multidimensional social comparisons of academic performance and resources, college students tend to experience relative deprivation when they perceive an imbalance between effort and outcome [14,25]. To protect self-worth, individuals with chronic deprivation experiences externally attribute their disadvantaged status to unfair resource allocation rather than personal limitations. This cognitive bias is linked to a stable psychological entitlement, whereby individuals believe they deserve preferential treatment and compensatory resources [21]. Based on the compensatory online use theory and the I-PACE model [11,12], this study further illustrates how psychological entitlement relates to Gen AI dependency. Individuals with high psychological entitlement prefer low-cost, constraint-free strategies and unconditional social approval [28]. However, real-world social interactions require reciprocal obligations and social constraints, which continuously frustrate privileged expectations. The persistent discrepancies between ideal and reality are linked to individuals' greater tendency to seek external compensation [21]. Gen AI appears well-suited to such compensatory needs. Its anthropomorphic interaction provides instant feedback and unconditional acceptance without social reciprocity [19], and its anonymity allows users to express diverse and unconventional demands free from social and moral restrictions [29]. Accordingly, college students with high psychological entitlement view Gen AI as a convenient and reliable tool for compensation. Frequent reliance on such technology may be associated with habitual patterns that increase the risk of developing a dependency on it. This study extends the compensatory online use theory and the I-PACE model to the context of Gen AI, showing that psychological entitlement is a key cognitive factor linking social stressors to problematic behaviors associated with Gen AI use.

Furthermore, it is necessary to distinguish two patterns of association with relative deprivation: an emotional response pattern and a cognitive-behavioral pattern. Cross-sectional studies have consistently shown that relative deprivation is associated with higher levels of perceived unfairness, as well as increased anger and depressive symptoms [24]. The I-PACE model posits that affective responses serve as initial triggers for behavioral impulses. At the same time, cognitive appraisal and executive functioning are critical for the development and maintenance of problematic behaviors [12]. Unlike fluctuating emotional states, psychological entitlement is a stable cognitive schema that correlates strongly with long-term behavioral tendencies [28,62]. Moreover, individuals with this trait tend to favor low-cost and high-reward compensatory strategies [21,28]. Gen AI, with its anthropomorphic, unconditionally responsive, and anonymous features, constitutes an ideal basis for such strategies [19,29]. Thus, this indirect effect suggests a cognitive compensatory process stemming from early emotional arousal, which may manifest as a prolonged dependency on Gen AI.

4.3 The Mediating Role of Self-Handicapping: Variable-Centered Perspective

This study found that self-handicapping exerted a significant indirect effect on the association between relative deprivation and Gen AI dependency, supporting H3. These findings are consistent with similar studies [32,35,36]. When individuals view themselves as being in a disadvantageous position, their self-worth becomes vulnerable, especially when they realize that their situation is difficult to change through active intervention [32]. According to the self-worth theory, individuals often seek rationalizations for their disadvantages [39]. They may use self-handicapping strategies, attributing their unfavorable circumstances to external factors [30]. In such cases, individuals who engage in high levels of self-handicapping may increasingly turn to Gen AI to externalize their unfavorable circumstances, rather than acknowledging their

shortcomings in personal capabilities. This strategy allows them to avoid acknowledging their individual weaknesses, as they prefer not to be perceived negatively by others. Conversely, when results are favorable, they may highlight that success can still be achieved despite a dependence on Gen AI, thereby enhancing their self-worth [35]. Additionally, the convenience and anthropomorphic features of Gen AI may lower barriers to the use of self-handicapping strategies [19]. Thus, individuals with strong self-handicapping tendencies are likely to form excessive dependency on Gen AI over time.

4.4 The Serial Mediation Roles of Psychological Entitlement and Self-Handicapping: Variable-Centered Perspective

This study found that psychological entitlement and self-handicapping showed a significant serial indirect effect linking relative deprivation to Gen AI dependency, supporting H4. Individuals with high psychological entitlement tend to have unrealistic expectations for success and recognition that exceed their actual abilities and circumstances. This tendency is linked to a belief that they deserve special treatment and attention [21,28]. When reality fails to meet such expectations, this situation correlates with heightened cognitive dissonance arising when personal efforts do not match perceived rewards [28]. According to cognitive dissonance theory, individuals may adopt self-handicapping as a coping strategy [37]. They often externalize their potential failures by attributing them to factors such as excessive task difficulty or environmental constraints [38]. Such attribution patterns are linked to the protection of self-identity and the maintenance of cognitive consistency. The results not only enhance our understanding of the complex relationship between relative deprivation and Gen AI dependency, but also offer new empirical evidence and theoretical insights for applying cognitive dissonance theory to the emerging field of Gen AI dependency research.

4.5 Relative Deprivation and Generative AI Dependency Profiles: Person-Centered Perspective

To explore potential subgroup differences in the association between relative deprivation and Gen AI dependence, we performed latent profile analysis with the two variables as profile indicators. While previous research has rarely examined this combined pattern, our analysis revealed the most parsimonious and interpretable solution, which comprised three profiles: a high co-occurrence level (7.6%, n = 121), a moderate co-occurrence level (47.3%, n = 753), and a low co-occurrence level (45.1%, n = 709). Additionally, the three profiles differed systematically in the levels of both relative deprivation and Gen AI dependence. This pattern is consistent with variable-centered results, further supporting that higher relative deprivation tends to correlate with greater Gen AI reliance.

Furthermore, the latent profile characterized by moderate co-occurrence was the most prevalent, accounting for the largest proportion of participants. This finding indicates that social comparison is highly associated with relative deprivation among most college students in China's educational setting [17,45]. Fortunately, higher education institutions have increasingly established comprehensive student support systems that encompass academic resources, career development services, and mental health counseling [63,64]. According to the compensatory online use model, college students experiencing deprivation may seek assistance from Gen AI [11]. Still, individuals recognize that excessive reliance on this technology may undermine their sense of autonomy, interpersonal competence, and independent problem-solving capacity [1]. Furthermore, college regulations concerning the use of Gen AI, such as prohibiting its application to core thesis content and restricting its use in assignments, establish clear boundaries for the tool [65]. This may partly explain why the profile with moderate co-occurrence of the two variables accounted for the largest proportion and emerged as the most prevalent subgroup among college students.

Additionally, it should be noted that the latent profiles identified here reflect variations in the levels of relative deprivation and Gen AI dependence, rather than qualitatively distinct subgroups. The three profiles differ only in score magnitude rather than fundamental categorical traits.

4.6 Differences in Psychological Entitlement and Self-Handicapping across Profiles: Person-Centered Perspective

This study also examined differences in psychological entitlement and self-handicapping across the profiles of relative deprivation and Gen AI dependency through LPA. The results revealed gradually decreasing scores on both psychological entitlement and self-handicapping from the high co-occurrence level to the moderate co-occurrence level, and then to the low co-occurrence level, with significant between-profile differences. This indicates that higher relative deprivation is associated with greater psychological entitlement, increased self-handicapping, and greater dependence on Gen AI. This conclusion aligns with findings from variable-centered research. The integration of variable-centered and person-centered approaches enables a more nuanced understanding of the relational patterns within different latent profiles. The variable-centered framework reveals the statistical mediating pathways, while the person-centered perspective captures mean-level differences across the identified profiles. Overall, both the correlational patterns and the mediation model are statistically validated.

4.7 Implications and Limitations

Research on Gen AI dependency, especially among college students, remains limited, and few studies have integrated variable-centered and person-centered analytical approaches. Against the backdrop of widespread Gen AI adoption, the present study examined how relative deprivation, psychological entitlement, and self-handicapping correlate with college students' Gen AI dependency, aiming to advance a more comprehensive understanding of the patterns of correlation among these variables. Furthermore, latent profile analysis identified three profiles of relative deprivation and Gen AI dependency, facilitating a more nuanced interpretation of the complex relationships among these variables. Additionally, the effect sizes of the mediating pathways reveal differing strengths of association between these variables. These effect sizes were interpreted based on conventional threshold criteria for standardized indirect effects [66]. Self-handicapping showed the strongest correlation, with an indirect effect of 0.146, which is considered moderate. In contrast, psychological entitlement shows a relatively weak independent association, with an indirect effect of 0.044, categorized as small. The serial indirect effect was 0.028, although small, it remains statistically significant. Thus, these findings contribute to existing theories and illustrate a serial pattern that connects cognitive perceptions to behavioral tendencies.

Practically, this study promotes balanced and self-regulated use of Gen AI among college students. Educators may consider helping students develop rational social comparison orientations and prioritize personal self-growth rather than engaging in blind upward social comparison. Meanwhile, targeted psychological guidance can help students maintain adaptive psychological entitlement and foster positive psychological defense mechanisms. Moreover, the differing explanatory strengths of the identified mediating pathways suggest a possible hierarchical guidance strategy for Gen AI dependency. Specifically, self-handicapping, as the behavioral pathway with a relatively larger explanatory magnitude, may warrant greater attention in relevant psychological guidance practices. While the cognitive pathway of psychological entitlement shows a relatively small effect size, its stable cognitive traits may make it a promising focus for proactive psychological guidance. Relevant guidance approaches could include helping students develop rational thinking and mitigating their irrational entitlement beliefs. Furthermore, the significant sequential indirect

effect may offer preliminary evidence for an integrated cognitive-behavioral framework. In contrast to single-dimensional approaches, simultaneously addressing cognitive entitlement beliefs and behavioral self-handicapping tendencies may exert complementary effects. Additionally, the cognitive-behavioral connection was particularly pronounced among the high co-occurrence profile identified via LPA, which accounted for 7.6% of the total sample. This profile exhibited significant sequential cognitive-behavioral characteristics, indicating that future research and initial guidance efforts could consider focused psychological monitoring for this specific population.

Nevertheless, several limitations should be considered. First, this study employed convenience sampling to distribute questionnaires to college students. Juniors and seniors were busy preparing for postgraduate entrance exams and civil service examinations, alongside job hunting and graduation internships, resulting in low participation willingness for this voluntary questionnaire. This skewed the grade composition of our sample and constrained the generalizability of our results. Besides, although college students represent the main user base of Gen AI [3], this research only targeted this group and did not include people from other age groups. To address the above limitations, future studies may adopt stratified random sampling to balance the proportion of students across all college grades, and expand the research scope to cover participants of different ages, so as to further improve the generalizability of the findings. Second, relative deprivation, psychological entitlement, self-handicapping, and Gen AI dependency are all associated with negative psychological and behavioral traits. As social desirability may affect how individuals respond to questionnaires, future behavioral experiments can help validate these associations. Third, the conceptualization and assessment of Gen AI dependency are still evolving in the relevant literature. Therefore, the findings should be interpreted as reflecting self-reported tendencies towards Gen AI dependency rather than clinically validated or objectively measured dependency. Future studies should formulate unified definitional criteria for this construct. Fourth, the present model did not incorporate emotional variables (e.g., anger, depression), which may constitute other relevant pathways alongside the cognitive mediators examined here. Future research could investigate the dynamic interplay between these emotional responses and cognitive schemas. Fifth, following the mainstream research paradigm in domestic academia, this study treated the Self-handicapping Scale as a unidimensional measure [50,54,55]. In contrast, most international theoretical and empirical works have identified two subdimensions: claimed self-handicapping and behavioral self-handicapping [67,68]. Due to the limitations of the analytical framework and research objectives, subdimension analyses were not performed in the present study. Future research may adopt this two-factor structure to further explore the relationships among different types of self-handicapping. Finally, a small number of item error covariances were added based on modification indices and substantive item content. Future research could conduct cross-validation with independent samples to further examine the model's stability and generalizability. Moreover, the cross-sectional design captures only concurrent associations measured at a single time point and cannot reflect the temporal sequence of changes in variables. Future longitudinal research can track dynamic shifts across time points to clarify how these variables evolve over time.

5 Conclusions

This study examined the relationship between relative deprivation and Gen AI dependency among college students, utilizing both variable-centered and person-centered approaches. We reached the following conclusions: (1) Relative deprivation is significantly positively associated with Gen AI dependency. Both psychological entitlement and self-handicapping showed significant indirect effects in the association between relative deprivation and Gen AI dependency. Additionally, the serial indirect effect of these

two variables was also significant. (2) The person-centered analysis of relative deprivation and Gen AI dependency identified three profiles: the low co-occurrence level, the moderate co-occurrence level, and the high co-occurrence level. Additionally, significant differences in psychological entitlement and self-handicapping were observed among these profiles. This study provides initial insights through a dual analytical lens that may guide future initiatives to promote self-regulation in the use of Gen AI among college students.

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