

FROM AI DEPENDENCE TO IMPOSTOR SYNDROME: THE MEDIATING
ROLE OF FEAR OF NEGATIVE EVALUATIONMuhammad Qasim Arif¹, Nimra Munawar^{*2}, Eza Rabab³¹Student, Lahore School of Behavioural Sciences, University of Lahore, Lahore, Pakistan^{*2,3}Lecturer, Lahore School of Behavioural Sciences, University of Lahore, Lahore, Pakistan¹muhammadqasimarif789@gmail.com, ^{*2}nimra.munawar@lsbs.uol.edu.pk, ³eza.rabab@lsbs.uol.edu.pkDOI: <https://doi.org/10.5281/zenodo.17191309>**Keywords***Impostor Syndrome, Fear of Negative Evaluation, AI Dependence, Artificial Intelligence***Article History**

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Corresponding Author: *

Nimra Munawar

Abstract

The study examined the psychological effects of the reliance on artificial intelligence (AI) applications and tools among university students, and how Fear of Negative Evaluation fosters the emergence of Impostor Syndrome. Data were collected from 200 undergraduate students, who completed validated questionnaires measuring AI dependence, Fear of Negative Evaluation, and Impostor Syndrome. The correlational analysis verified that a positive relationship exists between these three measured variables. A mediation analysis utilizing Hayes' PROCESS macro (Model 4) revealed that Fear of Negative Evaluation partially mediated the relationship between AI dependence and Impostor Syndrome. Students who heavily relied on AI technology showed greater concerns about negative evaluation, and these concerns later predicted their developing feelings of Impostor Syndrome. Students who depend on AI for academic work encounter both performance-related challenges and internal doubts about their authenticity while performing academic tasks. Educational institutions must provide training that fosters students' technical proficiency and intellectual confidence

INTRODUCTION

The emergence of AI tools, such as Grammarly and ChatGPT are reshaping the way in which students engage with their studies. On one hand, these tools can act as a shortcut for the modern-day student—an invaluable asset that can and should be used to help improve their writing and make their assignments less daunting. However, excessive reliance on these tools can have serious consequences not just for a student's mental health, but also for their academic performance. Many students today use AI-based resources and applications like ChatGPT, Grammarly, as well as paraphrasing software—not merely on occasion, but as an integrated component of their academic practices. For many, these tools are perceived as essential to academic success. In fact, students may

depend on them more than is beneficial for their psychological well-being or educational development. Academic confidence now appears increasingly tied to the extent of reliance on such resources. Suarez et al. (2025) found in a study among senior high school students in Central Visayas that students believed ChatGPT's usefulness was associated with enhanced confidence in their essay writing skills, particularly in aspects such as organization, interpretation, and grammar. While limited research has explored the phenomenon of AI dependence, two studies conducted in 2025 provide preliminary evidence on the nature of the relationship between AI dependence and students' academic self-perception. Estrada-Araoz et al. (2025) discovered

that the more students utilized AI to do their work, the less confident they were in their academic skills. Also, Mukhtar et al. (2025) found that extensive use of AI was linked to increased procrastination and withdrawal from the study materials.

Related emotional concerns have also emerged in the literature. Chan (2024) introduced the concept of “AI guilt,” describing students’ discomfort with using AI in ways they perceive as inauthentic. This newly emerging concept may overlap with Fear of Negative Evaluation, as students might feel afraid of social judgment for using AI tools. Similarly, concerns have been raised regarding AI’s influence on academic integrity and critical thinking (Memarian & Doleck, 2023).

Fear of Negative Evaluation is a core element of social anxiety and plays a significant role in influencing how students behave academically. This fear, which revolves around worrying about how others judge us, has been linked to procrastination, avoiding social situations, and anxiety during exams (Kim & Seo, 2024; Downing et al., 2020). Pioneering research by Watson and Friend (1969) led to the creation of the Brief Fear of Negative Evaluation Scale (Leary, 1983), and recent studies (Çam & Yerlikaya, 2020; Merguie, 2023) have reaffirmed its importance among students. Liew et al. (2014) found that the fear of being judged by others can mediate the connection between a tendency to avoid situations and academic success, backing up cognitive-behavioral theories that highlight the cycle of fear, avoidance, and self-doubt. In the age of AI, it’s likely that students who rely on these external tools worry about being ‘found out’ as inadequate, which only heightens their concerns about how they’re perceived by others (Schlenker & Leary, 1982).

University students often experience Impostor Syndrome, where they doubt their abilities despite being fully qualified and talented. Maftai et al. (2021) found that over half of surveyed psychology students experienced moderate to high levels of Impostor Syndrome, despite being high-achieving individuals—underscoring the disconnect between objective academic success and self-perceived

competence. A study in 2020 by Levant and others found that medical students with Impostor Syndrome are especially susceptible to burnout and feelings of stress. Recent developments in this field have yielded promising findings. Freeman et al. (2022) validated a tool called the Clance Impostor Phenomenon Scale in 2022.

Recently, Mekhzoumi et al. (2024) found that the effect of AI tools on Impostor Syndrome varies significantly depending on users’ self-confidence. This suggests that the relationship is nuanced and moderated by self-confidence. Their research introduces a new psychological perspective, showing how students’ use of AI can result in heightened fears of being judged negatively potentially exacerbating Impostor Syndrome. Although earlier studies have looked at different aspects of relying on AI, (Estrada-Araoz et al., 2025; Mukhtar et al., 2025), alongside concerns about Fear of Negative Evaluation (Kim & Seo, 2024) together with Impostor Syndrome (Maftai et al., 2021), there has not yet been a thorough exploration of how these pieces fit together. This research seeks to explore the links between social anxiety, AI usage, and feelings of inadequacy, aiming to shed light on the psychological dynamics behind the educational technologies we use today. Although it’s a possibility, we still lack sufficient evidence to determine how significantly Fear of Negative Evaluation mediates the relationship between AI use and Impostor Syndrome (Hayes, 2018). Recent findings indicate that engaging with AI can heighten social-evaluative concerns (Reif et al., 2025), and individuals with high FNE are particularly affected by AI acting as an evaluator (Goergen et al., 2025). This lends credence to the notion that Fear of Negative Evaluation plays a crucial role in linking AI dependence to Impostor Syndrome.

The current investigation is grounded in cognitive-behavioral theories of social anxiety and the impostor phenomenon (Wilke, 2018). Negative evaluation fear, as fear of judgment by others is called (Watson & Friend, 1969), has been consistently associated with avoidance, lack of maturity, and academic self-doubt (Kim & Seo, 2024). In the use of AI, it is possible that students who rely heavily on tools like ChatGPT may

increase concerns about being exposed as less capable without such support. This reliance on AI can really heighten feelings of inadequacy, leading to what we call Impostor Syndrome. This is when successful people attribute their achievements to luck or external factors rather than their own skills (Clance & Imes, 1978). From this viewpoint, the current research suggests that Fear of Negative Evaluation is a key psychological factor that connects our dependence on AI with Impostor Syndrome.

Based on this foundation, the current study evaluated three key hypotheses regarding the relationships between AI dependence, fear of negative evaluation, and impostor syndrome. First, it was hypothesized that AI dependence would positively predict fear of negative evaluation, suggesting that individuals who rely heavily on artificial intelligence may develop heightened concerns about being judged negatively by others. Second, the study proposed that fear of negative evaluation would serve as a positive predictor of impostor syndrome, indicating that those who worry about negative judgment are more likely to experience feelings of fraudulence and self-doubt about their abilities. Finally, the research examined whether fear of negative evaluation functions as a mediating variable in the relationship between AI dependence and impostor syndrome, potentially explaining the underlying mechanism through which reliance on AI technology contributes to impostor-like feelings through increased concerns about social evaluation and judgment.

Method

Participants

The study involved 200 undergraduate students from various universities throughout Pakistan, evenly split between 100 males and 100 females. The ages of the participants ranged from 18 to over 37 years, with the majority falling in the 18–22 age bracket (55.5%), followed by those aged 23–27 years (37.5%); only 7% were older than 27. When it comes to education, 75% of the students were pursuing Bachelor's degrees, while 25% were in Master's programs. In terms of academic performance, 46% reported a GPA between 3.6

and 4.0, 43% had GPAs ranging from 3.1 to 3.5, and 11% fell within the 2.5 to 3.0 range.

As for AI usage, 54.5% of participants used AI tools frequently (about three times a week), and 45.5% used them very frequently (four or more times a week). The participants came from a variety of academic fields, and the criteria for inclusion required them to use AI-based academic tools at least three times a week. A non-probability convenience sampling method was used. Online resources such as social media networks, student WhatsApp groups, and university discussion forums were used to attract participants. Data were gathered using forms for online surveys posted on Google Forms. Students gave their informed digital consent prior to participation. All answers to the anonymous survey were kept private.

Measurement Scales

Students' AI Dependency in 3R's Questionnaire

The Scale of Students' AI Dependency in 3R's Questionnaire, introduced and validated by Capinding (2024), was used to evaluate the extent to which the participants were dependent on AI. This 33-item measurement tool measures the extent to which students are using AI tools within three academic areas of instruction: Writing (11 items), Reading (10 items) and Numeracy/Arithmetic (12 items). Examples include: "I utilize AI-based spelling and grammar checkers when composing written content" (Writing), and "I trust AI-generated solutions for problem-solving." (Numeracy). The survey used a 4-point Likert-type scale from 1 ("Strongly Disagree") to 4 ("Strongly Agree") to measure the participants' responses (Capinding, 2024). Responses were scored using the mean of 33 items on the scale, with higher mean scores indicative of greater dependence on AI tools in academic disciplines. Four levels were employed to interpret the scores: Dependent (2.50–3.24), Highly Dependent (3.25–4.00), Slightly Dependent (1.75–2.49), and Not Dependent (1.00–1.74). In the present study ($N = 200$; 100 males, 100 females), internal consistency for the overall scale was excellent ($\alpha = .91$). Subscale reliability scores were as follows: Reading: $\alpha = .78$, Writing: $\alpha = .83$, Numeracy/Arithmetic:

$\alpha = .88$. These results confirm the multidimensional reliability of the scale for assessing AI dependence across foundational academic skills.

Brief Fear of Negative Evaluation Scale (BFNE)

The Brief Fear of Negative Evaluation Scale (Leary, 1983) was employed to assess participants' concerns about being negatively judged by others. This tool consists of 12 items designed to evaluate individuals' apprehension about receiving negative judgments from others. Sample items include: *"I am afraid others will not approve of me."*. Responses were collected on a 5-point Likert scale, where 1 indicated "Not at all like me" and 5 signified "Very much like me, with reverse scoring applied to positively worded items which were item 2, 4, 7 and 10. Higher total scores reflected a stronger Fear of Negative Evaluation. The BFNE demonstrated strong reliability in the present study ($\alpha = .81$).

Clance Impostor Phenomenon Scale (CIPS)

The Clance Impostor Phenomenon Scale (Clance, 1985) was used to measure impostor feelings among participants. This is a 20-item instrument designed to assess feelings of self-doubt, fears of being exposed as a fraud, and attributing achievements to luck or external circumstances. Sample items include: *"I can give the impression that I'm more competent than I really am"*. Participants rated each statement on a 5-point Likert scale ranging from 1 (Not at all true) to 5 (Very true). The total scores were used to categorize impostor experiences into four levels: few, moderate, frequent, and intense. The CIPS showed high internal consistency in this study ($\alpha = .86$).

Procedure

The sampling technique used was non-probability convenience sampling. The survey forms were

shared in online resources including social media platforms, student WhatsApp groups and university discussion forums. Data collection was done through online survey forms which were uploaded on Google Forms. Participants provided their informed digital consent before participation. Responses to the anonymous survey were not shared. The survey included three standardized instruments: the Students' AI Dependency in 3R's Questionnaire (Capinding, 2024), the Brief Fear of Negative Evaluation Scale (Leary, 1983), and the Clance Impostor Phenomenon Scale (Clance, 1985). Participants were requested to respond truthfully keeping in view their recent academic experiences. Completing the survey took approximately 10–15 minutes. After submission, responses were automatically saved and securely stored for analysis.

Results

SPSS was used to calculate the descriptive statistics for all key study variables; AI Dependence, Fear of Negative Evaluation and Impostor Syndrome (see Table 1). Table 1 demonstrates that the constructs of AI Dependence, Fear of Negative Evaluation, and Impostor Syndrome exhibit high internal reliability, Table 2 reports the results of Pearson correlation analyses conducted to examine the associations among AI Dependence, Fear of Negative Evaluation, and Impostor Syndrome. As indicated in Table 2, AI dependence showed a significant positive relationship with the Fear of Negative Evaluation, $r = .36$, $p < .001$, as well as with Impostor Syndrome, $r = .37$, $p < .001$. Additionally, Fear of Negative Evaluation also demonstrated a strong connection to Impostor Syndrome, $r = .53$, $p < .001$.

Table 1

Descriptive Statistics and Reliability Coefficients for AI Dependence, Fear of Negative Evaluation and Impostor Syndrome (N = 200)

Variable Name	α	K	M	SD	Range
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					Potential	Actual
AI Dependence	.91	33	2.83	0.41	1-4	1-4
Fear of Negative Evaluation	.81	12	26.94	8.65	12-60	12-54
Impostor Syndrome	.86	20	65.19	13.12	20-100	23-100

Note: K= Number of items in scale and subscale, α = reliability coefficient of variables.

The results indicate significant positive correlations among all three variables. AI Dependence showed a moderate positive correlation with Fear of Negative Evaluation ($r = .36$, $p < .001$) and with Impostor Syndrome ($r = .37$, $p < .001$). This suggests that higher dependence on AI is associated with greater fear of being negatively evaluated and stronger impostor feelings. Furthermore, Fear of Negative Evaluation was strongly positively correlated with Impostor Syndrome ($r = .53$, $p < .001$), indicating that

individuals who experience higher fear of negative evaluation are more likely to report stronger impostor tendencies. Overall, the findings reveal interconnected relationships, with fear of negative evaluation emerging as a stronger predictor of impostor syndrome compared to AI dependence (See Table 2).

Table 2

Pearson Correlation Coefficients Among Variables

Variable	1	2	3
1. AI Dependence	-	.36***	.37***
2. Fear of Negative Evaluation		-	.53***
3. Impostor Syndrome			-

Note. * $p < .05$. ** $p < .01$. *** $p < .001$. Correlations are Pearson's r .

A basic linear regression was performed to determine whether AI dependence could predict levels of Fear of Negative Evaluation (Table 3). The regression findings indicated that the model reached statistical significance, $F(1, 198) = 29.33$, $p < .001$, accounting for approximately 13% of the variance in Fear of Negative Evaluation ($R^2 = .13$). AI dependence was a significant positive predictor, $B = 7.50$, $SE = 1.39$, $t(198) = 5.42$, $p < .001$, 95% CI [4.77, 10.23], supporting Hypothesis 1.

A second regression analysis looked into whether Fear of Negative Evaluation (FNE) could predict Impostor Syndrome. The results were significant, with $F(1, 197) = 50.97$, $p < .001$, showing that the model accounted for 21% of the variance ($R^2 =$

.21). It turns out that FNE was a strong predictor of Impostor Syndrome, with $B = 0.68$, $SE = 0.10$, $t(197) = 7.14$, $p < .001$, 95% CI [0.49, 0.87]. This suggests that students who feel a higher fear of negative evaluation are more likely to experience feelings of being an impostor. To evaluate Hypothesis 3, mediation analysis was conducted with Hayes' PROCESS macro (Model 4), employing 5,000 bootstrap samples (Hayes, 2018). A significant indirect effect of AI dependence on Impostor Syndrome emerged through Fear of Negative Evaluation, $B = 5.13$, Boot SE = 1.30, 95% CI [2.77, 7.81], since the confidence interval excluded zero. The direct association between AI dependence and Impostor Syndrome persisted as

significant even after controlling for Fear of Negative Evaluation, $B = 6.71$, $SE = 2.00$, $t = 3.36$, $p = .001$, 95% CI [2.77, 10.65], indicating partial mediation (see Table 3). This suggests that while AI dependence directly predicts Impostor Syndrome, a significant proportion of it is explained through Fear of Negative Evaluation (Table 3).

Table 3

Mediation Analysis Summary: Fear of Negative Evaluation as a Mediator Between AI Dependence and Impostor Syndrome

Effect Type	Pathway	B	SE	95% CI (LL, UL)	<i>p</i>
Total Effect	AID → IS	11.84	2.09	7.72, 15.95	< .001
Direct Effect	AID → IS (controlling for FNE)	6.71	2.00	2.77, 10.65	.001
Indirect Effect	AID → FNE → IS	5.13	1.30	2.77, 7.81	–

Note. $N = 200$. Bootstrap sample = 5,000. CI = confidence interval; AID = AI Dependence; FNE = Fear of Negative Evaluation; IS = Impostor Syndrome.

Discussion

This research explored the relationships among AI dependence, Fear of Negative Evaluation, and Impostor Syndrome within a university student population, testing a mediation model in which Fear of Negative Evaluation acted as the mediator. Each of the three hypotheses was supported. First, students who heavily rely on AI tools may harbor concerns regarding evaluations that question their independent academic competence, as AI dependence strongly predicted greater anxiety about negative evaluation. Second, Impostor Syndrome was significantly predicted by fear of unfavorable evaluation, consistent with earlier studies linking social-evaluative anxiety to attributional distortions and self-doubt. Lastly, the association between AI dependence and Impostor Syndrome was partially mediated by Fear of Negative Evaluation, suggesting evaluative worries account for some, but not all, of the relationship between Impostorism and AI dependence. These findings support and extend prior literature. Prior studies have shown that AI reliance can decrease self-esteem and academic confidence (Zhang et al., 2024). Our research adds evidence of a potential pathway: greater AI

dependence is linked to psychological factors—including Fear of Negative Evaluation and impostor feelings—that may reflect a diminished academic self-concept (Zhang et al., 2024; Estrada-Araoz et al., 2025). This result is consistent with earlier studies proposing that individuals reliant on AI tools may fear being judged for lacking competence or academic integrity.

According to theories of social appraisal and self-presentation, the significant mediation suggests that students may experience heightened anxiety about interpersonal judgment or perceptions of academic dishonesty in addition to doubting their own abilities (Schlenker & Leary, 1982). Moreover, the persistence of a direct effect from AI dependence to Impostor Syndrome, even after accounting for Fear of Negative Evaluation, indicates that other psychological mechanisms (e.g., self-efficacy, academic guilt, or AI-related anxiety) may also contribute to this relationship.

Theoretical and Practical Implications

The findings have both theoretical and applied implications. Theoretically, they support cognitive-behavioral models of anxiety, which suggest that fear of exposure leads to avoidance,

reinforced doubt, and maladaptive beliefs (e.g., “I only succeeded because of AI”). Practically, these results highlight the importance for universities to consider not only the ethical implications of AI use but also its psychological effects. Educators should foster environments where help-seeking and the use of tools are normalized without undermining students’ sense of competence.

Limitations

Several constraints of this study are important to acknowledge. First, the study’s cross-sectional design restricts causal interpretations. While mediation was tested statistically, temporal order cannot be confirmed. Secondly, reliance on self-reported data may have led to possible distortions, such as tendencies toward socially desirable responses or inaccuracies stemming from memory limitations. Third, the sample was drawn from Pakistani undergraduates and may not generalize to other cultural or academic contexts. Finally, only one mediator was tested; future research could explore additional mechanisms such as academic self-efficacy or AI-related guilt.

Future studies should use longitudinal or experimental designs to examine how AI use affects students’ psychological functioning over time. It would also be valuable to explore whether different categories of AI tools (such as chatbots compared to grammar checkers) have different psychological impacts. Despite these limitations, this study offers initial evidence that AI reliance is not just an academic issue but a psychological one, operating through students’ social-evaluative fears to shape their sense of academic identity.

Conclusion

In conclusion, this study offers evidence backing the notion that Fear of Negative Evaluation serves as a key psychological mechanism linking AI dependence to Impostor Syndrome among university students. With Artificial Intelligence applications and tools getting increasingly embedded into academic settings, it becomes imperative to consider both their practical advantages and their psychological costs. By highlighting a pathway through which social-evaluative fears are intensified by technological

reliance, this work adds to a deeper comprehension of the ways in which digital tools intersect with students’ academic self-concept. Addressing these dynamics through supportive educational policies and mental health interventions may support responsible AI use while preserving students’ confidence in their own academic capabilities.

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