

## The Struggle Behind Success: How Personality Traits and Procrastination Shape Academic Achievement

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### Abstract

Academic achievement is influenced by two psychological constructs i.e. procrastination & personality traits, but the combined impact of them didn't get much attention in Pakistani context. The current study investigates the potential mediating role of procrastination between academic achievement and the Big Five personality traits. 200 undergraduate students between the ages of 18 and 25 who were chosen via purposive sampling participated in a cross-sectional correlational design. The Big Five Inventory-10 (Rammstedt & John, 2007), the Irrational Procrastination (Steel, 2010), and the Academic Performance Scale (Birchmeier et al., 2011) were among the standardized tools that were used in this study. In data analysis correlation method and mediation testing using PROCESS macro-Model 4 were used. The correlational findings show that extraversion, agreeableness, conscientiousness and openness to change had positive correlation with academic achievement and negative correlation with procrastination. While neuroticism showed negative correlation with academic performance and positive correlation with procrastination, Mediation analysis showed that procrastination partially mediated the effects of Extraversion ( $\beta = 0.13$ , 95% CI [0.18, 0.82]), Conscientiousness ( $\beta = 0.146$ , 95% CI [0.155, 0.828]), openness to change ( $\beta = 0.13$ , 95% CI [0.17, 0.78]) on academic performance. On the other hand, the association between neuroticism and academic performance was fully mediated by procrastination ( $\beta = -0.13$ , 95% CI [-1.44, -0.38]). However, procrastination did not show a significant indirect effect with agreeableness ( $\beta = 0.06$ , 95% CI [-0.14, 0.61]). The study concludes that personality traits influence academic achievement both directly and indirectly through procrastination, with the omission of agreeableness. Extraversion, conscientiousness and openness to change enhance academic achievement partially by reducing procrastination, however neuroticism lowers academic performance through procrastination. Agreeableness however does not show a significant indirect effect with procrastination. These results highlight procrastination as an important behavioral pathway linking personality trait to academic achievement and suggest that endorsing self-regulation skills may help improve student's academic outcomes.

**Keywords:** Personality Traits, Big Five, Procrastination, Academic Achievement

### Introduction

Academic achievement in higher education has traditionally been qualified to cognitive abilities nevertheless; recent research highlights the importance of non-cognitive factors in explaining differences in the academic performance of students. Between these personality traits and academic procrastination have been identified as key psychological contributors to success in college students (Friedrich & Schütz, 2023; Steinmayr et al., 2014). These factors do not function in isolation in complex ways to influence student's learning behaviors,

motivation and academic consequences. Personality traits reflect rather stable patterns of thinking, feeling and behaving that differentiate individuals across various situations and over time (Diener & Lucas, 2019). The Big Five Personality trait is the most broadly used framework for studying personality traits, which include extraversion, conscientiousness, agreeableness, neuroticism and openness to change (Costa & McCrae, 1992). Research constantly shows that conscientiousness is the strongest predictor of academic achievement, as students with high conscientiousness are generally organized, disciplined and goal-oriented (Gao et al., 2021; Rani Bhattacharjee & Ramkumar, 2025). Whereas neuroticism, is characterized by emotional uncertainty and anxiety, is linked to lower academic performance due to increased stress and escaping actions (Friedrich & Schütz, 2023).

Openness has been linked to positive academic outcome, usually in learning environments that highlight academic interest and creativity (Poropat, 2009). Whereas extraversion shows mixed links with academic achievement, as it may facilitate classroom engagement while also increasing weakness to distraction (Richardson et al., 2012). While agreeableness usually supports academic achievement through positive relationship with peers and trainers (O'Connor & Paunonen, 2007).

Procrastination is defined as the thoughtful and irrational delay of tasks without being aware of the possible negative consequences (Shoaib et al., 2025; Steel, 2007a). This type of behavior is often showed in delaying academic study, submitting assignments or preparing for exams, which can develop increased level of stress and lower academic performance (González-Brignardello et al., 2023).

Globally, it has been estimated as 20% to 70% of college students engage in procrastination, while some studies also report as high as 80% (Shoaib et al., 2025; Zhang & Ma, 2024). Meta-analytic research reliably shows a strong negative relationship between procrastination and academic achievement (Huang et al., 2025) (Huang et al., 2025). Although personality traits and procrastination each have been linked to academic achievement, research examining their combined effects is still limited, particularly in non-Western settings. Studies in Pakistan indicate high levels of procrastination and challenges with self-regulation, which are associated with lower academic performance and greater academic anxiety (Hameed et al., 2025; Hussain et al., 2023).

Therefore, the present study aims to address this gap by examining how Big Five personality traits relate to academic achievement among Pakistani college students, with procrastination as a mediator. By accepting a combined and culturally contextualized approach, this research seeks out to contribute to both theory and practice by clarifying the psychological instruments primary academic success in higher education.

## **Literature Review**

Research constantly emphasizes the important role of personality traits in influencing academic performance. Among the Big Five traits, conscientiousness emerges as the most consistent predictor, as students who are organized, disciplined, and goal-oriented tend to develop active study habits and achieve higher grades. (Coşa & Cernat, 2025; Mammadov, 2022). While openness to experience can support academic success in settings that value interest and profound learning, the effects of extraversion and agreeableness are generally weaker and context-dependent. Neuroticism, on the other hand, is frequently associated with lower academic performance due to emotional instability and anxiety (Fuente et al., 2024; Wang et al., 2023).

Evidence from Pakistan mirrors these international findings, showing high levels of procrastination among students and indicating that conscientiousness and self-discipline are critical predictors of academic achievement (A. Hashmi & Naz, 2020).

## **Theoretical Background**

This study is showed by a theoretical framework that contributes personality traits and educational research to explain the bond between personality traits, procrastination and academic achievement. The Big Five personality model of personality serves as the foundation, with conscientiousness and neuroticism being most

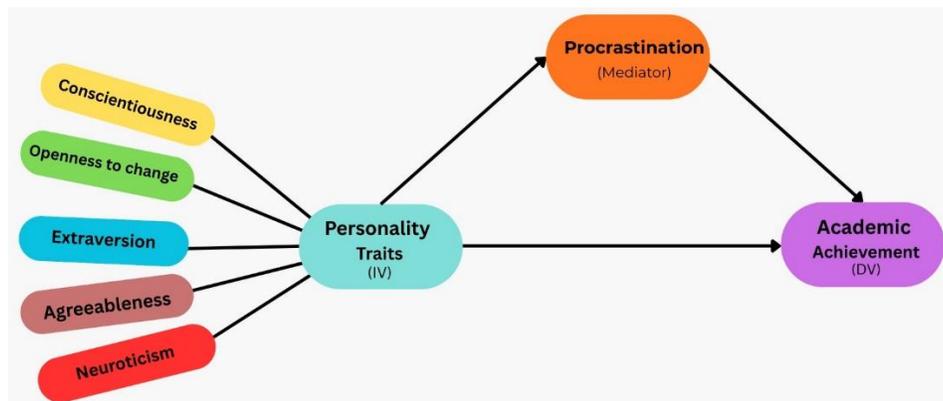
leading. Conscientious students create thoroughness, organization and resolution, which promote active arrangement and constant effort toward academic achievement (Mammadov, 2022). While students who have high neuroticism are prone to anxiety and emotional dysregulation, which can weaken self-regulation and academic performance (Wang et al., 2023).

Progressive overlooking a concept from behavioral economics, explains how individuals incline to devalue rewards that are suspended. Choosing leisure activities instead of studying echoes student's preferences for immediate pleasure. Steel's temporal motivation theory (Steel et al., 2018) factors such as delay, hope, value and impulsivity to explain procrastination, the motivation to complete a task reduces as the deadline becomes more reserved (John & Srivastava, 1999).

Mixing these viewpoints, the study conceptualizes academic achievement as the result of a constant structure also affects procrastination and overall academic performance. Conscientiousness serves as a shielding factor that lessens procrastination, whereas neuroticism and lower self-regulatory capacity increase helplessness to delay and negatively impact academic consequences. Evidence from Pakistan supports this framework, which highlight the applicability of these constructs in the local educational context (D. A. Hashmi & Naz, 2020; Salaam et al., 2024).

In contrast personality traits are also known to affect academic performance, most research has studied them separately, often leading the possible mediating role of procrastination. Evidence is especially rare in eastern contexts such as Pakistan, where cultural and educational shape student's procrastination predispositions and academic outcomes. In addition, some studies have analytically discovered how various personality traits impact academic performance through procrastination, leaving behind the mechanisms largely unexamined. This study aims to fill gap by investigating the mediating role of academic procrastination in the relation between personality traits and academic achievement between college students.

## Conceptual Framework



## **Methodology**

The students between the ages of 18 and 25 were selected using purposive sampling (N=200) in a cross-sectional correlational approach (Fritz & MacKinnon, 2007) (both males and females) from various departments of the college, selected using a purposive sampling technique, a nonprobability sampling method. Participants are enrolled in undergraduate programs.

**Inclusion Criteria** required students to fall within the specified age range and to provide intentional consent to participate in the study.

**Exclusion Criteria** included individuals with diagnosed psychological or cognitive disorders.

## **Research Design**

This study employed a correlational research design to examine the relationships between personality traits, academic procrastination, and academic achievement among college students. Similar approaches have been used in prior research on academic behaviors, for instance, the study examined the relationship between personality traits and procrastination (Shoaib et al., 2025). This study demonstrates the effectiveness of the correlational design in studying naturally occurring relationships in educational settings.

## **Sampling technique**

Purposive sampling was used in this study because the research required a specific group of participants, undergraduate students aged 18–25 who were actively involved in academic work Shoaib et al. (2025) and Hidalgo-Fuentes et al. (2024) used purposive sampling, selecting students engaged with educational responsibilities, as this group is most relevant for studying procrastination and self-regulation.

## **Measuring Instruments**

The BFI-10 (Rammstedt & John, 2007) is a brief 10-item scale measuring the five major personality traits (Openness, Conscientiousness, Extraversion, Agreeableness, Neuroticism). Each trait is assessed with two items on a 5-point Likert scale. It shows good validity and acceptable reliability for a quick personality assessment. The Irrational Procrastination Scale (IPS) is a 9-item tool that measures the tendency to delay tasks unnecessarily. Higher scores on a 5-point scale indicate higher levels of procrastination; certain items are reverse-coded. This scale has high degree of reliability and is broadly used in academic achievement (Steel, 2010). The Academic performance scale (APS) consists of eight items measuring academic performance such as preparation, motivation, participation and academic efforts. The items are rated on a 5-point scale, with high score indicating better academic performance. This scale exhibits excellent reliability and stability (Birchmeier et al., 2011).

## **Procedure**

The study used English version of standardized tests, they were chosen in discussion with research supervisor to guarantee their pertinence and application for the subjects. Purposive sampling was used to select undergraduate candidates after departmental approval. With approval from the professor, data was collected during class time. Three validated measures were administered to participants, the academic performance scale (APS), the procrastination Questionnaire (PQ), and the Big Five personality inventory (BFI-10). Students received clear instructions and telling the purpose of the study before starting the questionnaire. To guarantee accuracy and cur down on mistakes and minimize missing responses was maintained throughout.

## **Ethical Consideration**

All ethical guidelines were strictly followed by informing participants about the purpose of the study, taking their intended consent, and ensuring the confidentiality of their response. All participants were allowed to

withdraw from the study at any point without any consequences, and no physical or psychological harm was occurred during the research.

### Statistical Analyses

First of all, SPSS version 27 was used for data screening and analysis. To summarize study characteristics and participant demographics, descriptive statistics were calculated. The associations between continuous variables were then examined using Pearson correlation coefficients. Group differences were investigated using independent samples t-tests and one-way ANOVA. Lastly, Hayes' PROCESS Macro (Model 4) was used to evaluate how personality factors indirectly affect academic achievement through procrastination.

### Results

In this study Two hundred undergraduate students participated. With a mean age of 20.73 years and a standard deviation of 1.49, participant's ages ranged from 18 to 25, suggesting that most respondents were in their early adult years. The measures showed good to excellent reliability: BFI-10 ( $\alpha = .779$ ), Academic Performance Scale ( $\alpha = .910$ ), and Procrastination Questionnaire ( $\alpha = .885$ ).

### Correlation Analysis

**Table 1**

Variables	1	2	3	4	5	6	7
Extraversion	—						
Agreeableness	.55**	—					
Conscientiousness	.58**	.61**	—				
Neuroticism	-.46**	-.49**	-.52**	—			
Openness	.51**	.57**	.59**	-.43**	—		
Procrastination	-.48**	-.62**	-.55**	.38**	-.48**	-.58**	—
Academic Performance	.42**	.57**	.43**	-.32**	.44**	.58**	-.42**

Note. Values are Pearson product-moment correlation coefficients. \*\*  $p < .01$  (two-tailed). Positive coefficients indicate positive relationships, whereas negative coefficients indicate inverse relationships among variables.

Table 1 presents the Pearson correlations among the Big Five traits, procrastination (PQ), and academic performance (APS). All reported correlations were significant at  $p < .01$ . Extraversion was positively related to academic performance ( $r = .42, p < .01$ ) and negatively related to procrastination ( $r = -.48, p < .01$ ). Agreeableness likewise correlated positively with performance ( $r = .57$ ) and negatively with procrastination ( $r = -.62$ ). Conscientiousness was positively correlated with academic performance ( $r = .43$ ) and negatively with procrastination ( $r = -.55$ ). Neuroticism showed the opposite pattern: it correlated negatively with academic performance ( $r = -.32$ ) and positively with procrastination ( $r = .38$ ). Openness was positively associated with academic performance ( $r = .44$ ) and negatively with procrastination ( $r = -.48$ ). In addition, procrastination was negatively correlated with academic performance ( $r = -.42, p < .01$ ).

### Mediation Analyses

**Table 2**

*Mediation Results Table (BFPI:1 personality trait Extraversion)*

Path / Effect	<i>B</i>	<i>SE</i>	<i>T</i>	<i>P</i>	<i>CI [LL, UL]</i>	$\beta$
Path a (BFSI_F1 → PQ_T)	-1.615	0.218	-7.42	<.001	[-2.04, -1.19]	-0.479
Path b (PQ_T → APS_T)	-0.297	0.076	-3.91	<.001	[-0.45, -0.15]	-0.286
Path c (Total: BFSI_F1 → APS_T)	1.495	0.233	6.40	<.001	[1.03, 1.96]	0.426
Path c' (Direct: BFSI_F1 → APS_T)	1.014	0.256	3.96	<.001	[0.51, 1.52]	0.289
Indirect effect (a × b)	0.480	0.162	—	—	[0.18, 0.82]	0.137

Note. *B* = Unstandardized regression coefficient, *SE* = Standard Error; *T* = t-value, *p* = Significance level, *CI [LL, UL]* = 95% Confidence Interval (Lower Limit, Upper Limit),  $\beta$  = Standardized regression coefficient, *X* = Independent variable (Extraversion, BFI), *M* = Mediator (Procrastination, PQ), *Y* = Dependent variable (Academic Performance, APS).

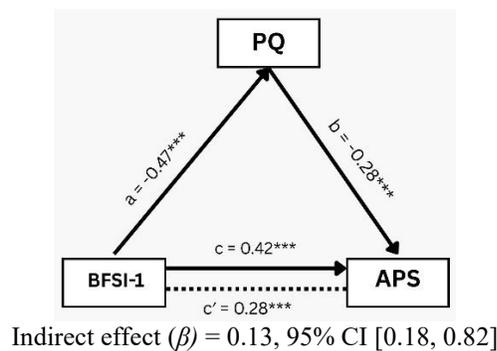


Figure 1 shows that extraversion significantly predicted procrastination ( $\beta = -0.47$ ,  $p < .001$ ) and procrastination predicted APS, but in a negative direction ( $\beta = -0.28$ ,  $p < .001$ ). It also had a direct effect on APS\_T ( $\beta = 0.28$ ,  $p < .001$ ), with a significant total effect on academic performance ( $B = 0.42$ ,  $p < .001$ ). The indirect effect through procrastination was significant ( $\beta = 0.13$ , 95% CI [0.18, 0.82]), suggesting that procrastination partially mediated the relationship between extraversion and academic performance.

**Table 3**

*Mediation Results Table (BFPI:2 Personality trait Agreeableness)*

Path/effect	<i>B</i>	<i>SE</i>	<i>T</i>	<i>P</i>	<i>CI [LL, UL]</i>	$\beta$
Path a (BFSI_F2 → PQ_T)	-2.08	0.19	-10.96	< .001	[-2.46, -1.71]	-.63
Path b (PQ_T → APS_T)	-0.11	0.08	-1.33	.184	[-0.26, 0.05]	-.10
Path c (Total: BFSI_F2 → APS_T)	2.00	0.21	9.62	< .001	[1.59, 2.41]	.58

Path/effect	<i>B</i>	<i>SE</i>	<i>T</i>	<i>P</i>	CI [LL, UL]	$\beta$
Path c' (Direct: BFSI_F2 → APS_T)	1.78	0.27	6.69	< .001	[1.25, 2.30]	.51
Indirect effect (a×b via PQ_T)	0.22	0.19	—	—	[-0.14, 0.61]	.06

Note. B = Unstandardized regression coefficient, SE = Standard Error, T = t-value, p = Significance level, 95% CI = Confidence Interval,  $\beta$  = Standardized regression coefficient, X = Independent variable (Agreeableness, BFI), M = Mediator (Procrastination, PQ), Y = Dependent variable (Academic Performance, APS).

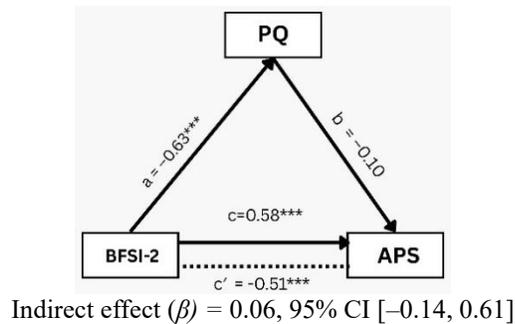


Figure 2 shows that agreeableness significantly predicted procrastination ( $\beta = -0.63$ ,  $p < .001$ ) and academic performance ( $\beta = 0.58$ ,  $p < .001$ ), but on the other hand, procrastination did not significantly predict academic performance ( $\beta = -0.10$ ,  $p = .184$ ). The direct effect of agreeableness on academic performance while controlling for procrastination was ( $\beta = 0.51$ ,  $p = .001$ ). Furthermore, the indirect effect via procrastination was also non-significant ( $\beta = 0.06$ , 95% CI [-0.14, 0.61]), indicating procrastination didn't mediate between agreeableness and academic performance.

**Table 4**  
*Mediation Results Table (BFPI:3 personality trait Conscientiousness)*

Path/effect	<i>B</i>	<i>SE</i>	<i>T</i>	<i>P</i>	CI (LL – UL)	$\beta$
Path a (BFSI_F3→PQ_T)	-1.7055	0.1868	-9.132	<.001	-2.074 – -1.337	-0.5543
Path b (PQ_T→APS_T)	0.9218	0.2464	3.741	<.0002	0.436 – 1.408	0.2873
Path c (Total: BFSI_F3→APS_T)	-0.2749	0.0801	-3.433	<.0007	-0.433 – -0.117	-0.2636

Path/effect	<i>B</i>	<i>SE</i>	<i>T</i>	<i>P</i>	<i>CI (LL – UL)</i>	$\beta$
Path <i>c'</i> (Direct: BFSI_F3→APS_T)	1.3906	0.2109	6.595	<.001	0.975 – 1.807	0.4334
Indirect effect ( <i>a</i> × <i>b</i> via PQ_T)	0.4688	0.1728	___	___	0.155–0.828	0.1461

Note. *B* = Unstandardized regression coefficient, *SE* = Standard Error; *T* = t-value, *p* = Significance level, *CI* = 95% Confidence Interval (LL = Lower Limit, UL = Upper Limit),  $\beta$  = Standardized regression coefficient, BFSI\_F3 = Conscientiousness (Big Five Inventory).

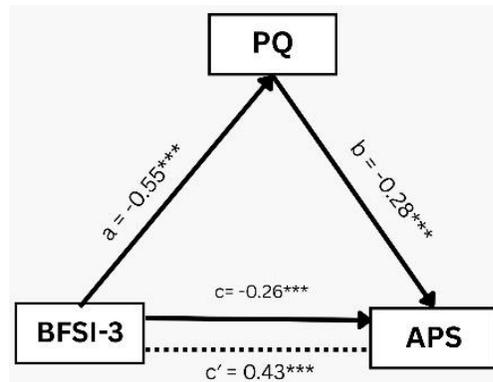


Figure 3 shows that conscientiousness (BFSI\_F3) significantly predicted lower procrastination ( $\beta = -0.55$ ,  $p < .001$ ), and procrastination significantly predicted academic performance in a negative direction ( $\beta = -0.28$ ,  $p < .001$ ). The total effect of conscientiousness on academic performance was significant ( $\beta = -0.26$ ,  $p = .001$ ), and the direct effect remained significant after controlling for procrastination ( $\beta = 0.43$ ,  $p < .001$ ). The indirect effect via procrastination also remained significant ( $\beta = 0.146$ , 95% CI [0.155, 0.828]), indicating partial mediation.

**Table 5**  
*Mediation Results Table (BFPI: 4 Personality Trait Neuroticism)*

Path / Effect	<i>B</i>	<i>SE</i>	<i>T</i>	<i>P</i>	<i>CI[LL, UL]</i>	$\beta$
Path <i>a</i> (BFIS_F4→PQ_T)	2.34	0.42	5.59	<.001	[1.52, 3.17]	.38
Path <i>b</i> (PQ_T→APS_T)	-0.37	0.07	-5.02	<.001	[-0.51, -0.22]	-.35

Path / Effect	<i>B</i>	<i>SE</i>	<i>T</i>	<i>P</i>	<i>CI</i> [ <i>LL</i> , <i>UL</i> ]	$\beta$
Path c (Total: BFIS_F4→APS_T)	-2.07	0.45	-4.62	<.001	[-2.95, -1.18]	-.32
Path c' (Direct: BFIS_F4→APS_T)	-1.20	0.45	-2.65	<.009	[-2.10, -0.31]	-.19
Indirect effect (a×b via PQ_T)	-0.86	0.27*	—	—	[-1.44, -0.38]	-.13

Note. B = Unstandardized coefficient; SE = Standard Error; T = t-value; p = Significance, CI = Confidence Interval,  $\beta$  = Standardized coefficient, BFIS\_F4 = Neuroticism, PQ\_T = Procrastination, APS\_T = Academic Performance.

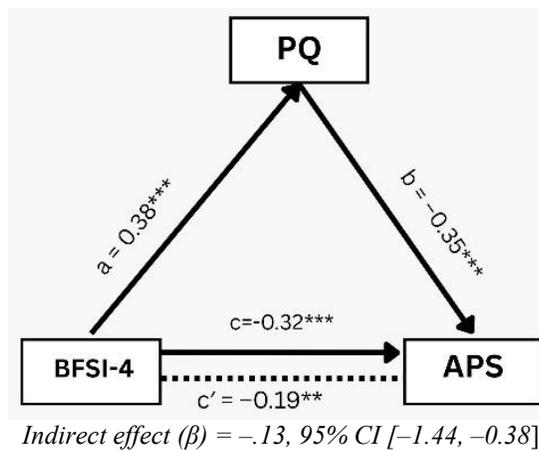


Figure 4 shows that neuroticism (BFIS\_F4) positively predicted procrastination ( $\beta = 0.38$ ,  $p < .001$ ) and negatively predicted academic performance ( $\beta = -0.32$ ,  $p < .01$ ); on the other hand, procrastination also negatively predicted academic performance ( $\beta = -0.35$ ,  $p < .001$ ). The direct effect on academic performance was significant ( $\beta = -0.19$ ,  $p < .001$ ), and the indirect effect via procrastination was also significant ( $\beta = -0.13$ , 95% CI [-1.44, -0.38]), indicating full mediation.

**Table 6**  
Mediation Results Table (BFPI: Personality Trait Openness)

Path / Effect	<i>B</i>	<i>SE</i>	<i>T</i>	<i>P</i>	[ <i>LL</i> , <i>UL</i> ]	$\beta$
Path a (BFIS_F5→PQ_T)	-1.59	0.21	-7.48	<.001	[-2.01, -1.17]	-.48
Path b (PQ_T→APS_T)	-0.28	0.07	-3.75	<.001	[-0.43, -0.13]	-.27
Path c (Total: BFIS_F5→APS_T)	1.56	0.23	6.91	<.001	[1.11, 2.00]	.45
Path c' (Direct: BFIS_F5→APS_T)	1.11	0.25	4.48	<.001	[0.62, 1.60]	.32
Indirect Effect (a × b via PQ_T)	0.45	0.16	—	—	[0.17, 0.78]	.13

Note. B = Unstandardized coefficient, SE = Standard Error, t = t-test; p = Significance, CI = Confidence Interval,  $\beta$  = Standardized coefficient, BFIS\_F5 = Openness, PQ\_T = Procrastination, APS\_T = Academic Performance.

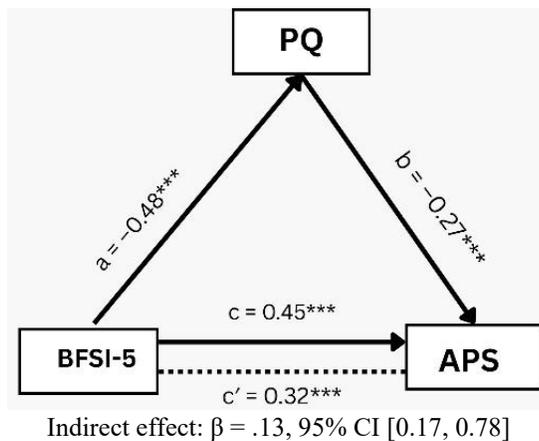


Figure 5 shows that openness (BFIS\_F5) significantly predicted procrastination ( $\beta = -0.48$ ,  $p < .001$ ) and academic performance directly ( $\beta = 0.32$ ,  $p < .001$ ), while procrastination negatively predicted academic performance ( $\beta = -.27$ ,  $p < .001$ ). The total effect of openness on academic performance was also significant ( $\beta = 0.45$ ,  $p < .001$ ). In addition, the indirect effect through procrastination was significant too ( $\beta = 0.13$ , 95% CI [0.17, 0.78]), indicating partial mediation.

### Discussion

The present study examined the relationships between the Big Five personality traits, academic procrastination, and academic performance among undergraduates. Extraversion, agreeableness, conscientiousness, and openness were positively associated with academic achievement and negatively with

procrastination; however, neuroticism positively correlates with procrastination and negatively with academic performance. Mediation analyses revealed that procrastination partially explained the effects of extraversion, conscientiousness, and openness on academic performance, while procrastination fully mediated the relationship between neuroticism and academic performance. Furthermore, agreeableness did not show a significant mediation effect.

**H1: It was hypothesized that significant relationships exist among the Big Five personality traits, procrastination, and academic performance.**

Our findings showed that all five personality traits were significantly related  $p < 0.05$  to procrastination and academic performance. In particular, Extraversion correlated positively with academic performance ( $r = .42$ ,  $p < .01$ ). This pattern mirrors prior work suggesting that outgoing, energetic students engage more actively with coursework and are less likely to delay tasks (Hidalgo-Fuentes et al., 2024).

Agreeableness also showed strong associations with academic performance and procrastination (AP:  $r = .57$ , PQ:  $r = -.62$ ). A study revealed that cooperative, self-disciplined students tend to exhibit better study habits and lower procrastination. Another research had found that higher agreeableness is associated with lower procrastination (Hidalgo-Fuentes et al., 2024).

Conscientiousness was likewise positively related to academic performance ( $r = .43$ ,  $p < .01$ ) and negatively with procrastination ( $r = -.55$ ,  $p < .01$ ). This strong pattern is well established: highly conscientious individuals are organized and diligent, which strongly predicts higher GPA (Mammadov, 2022).

However, neuroticism behaved oppositely; it was negatively correlated with academic performance ( $r = -.32$ ,  $p < .01$ ) and positively with procrastination ( $r = .38$ ,  $p < .01$ ). This matches prior findings that anxious or emotionally unstable students tend to underperform academically (Rani Bhattacharjee & Ramkumar, 2025).

Openness showed a positive association with academic achievement ( $r = .44$ ,  $p < .01$ ) and a negative association with procrastination ( $r = -.48$ ,  $p < .01$ ). A recent study indicates that students who are open to experience may be more curious and engaged, which promotes better grades (Rani Bhattacharjee & Ramkumar, 2025).

**H2: It is hypothesized that there will be a significant relationship between big five personality traits and academic performance through the association of procrastination**

Mediation analyses tested H2 by examining indirect effects of each trait on academic performance through procrastination. We found significant indirect paths for four of the five personality traits. For Extraversion, the indirect effect on academic performance via procrastination was ( $\beta = 0.13$ , 95% CI [0.18, 0.82]), indicating that more extraverted students procrastinate less and thus achieve higher grades. Openness also had a positive indirect effect on academic performance through procrastination ( $\beta = .13$ , 95% CI [0.17, 0.78]). Consistent with the present findings, Extraversion and Openness are negatively associated with academic procrastination, indicating that students higher in these traits tend to procrastinate less (Sumanti et al., 2025).

Conscientiousness showed a similar pattern ( $\beta = 0.146$ , 95% CI [0.155, 0.828]), consistent with research that conscientious individuals reliably avoid delay. The supporting study found that procrastination significantly mediated the relation between conscientiousness and academic achievement. (Sparfeldt & Schwabe, 2024).

By contrast, Neuroticism had a significant negative indirect effect ( $\beta = -.13$ , 95% CI [-1.44, -0.38]). Importantly, while the total effect of neuroticism on academic performance was significant ( $B = -2.07$ ,  $p < .001$ ), the direct effect became non-significant when procrastination was entered ( $B = -0.62$ ,  $p = .058$ ). This confirms that procrastination fully mediated the relationship between neuroticism and academic performance. In other words, students high in neuroticism did not perform well academically because they engaged in more procrastination. Studies show that neuroticism is strongly positively correlated with procrastination and

negatively correlated with academic performance (Lee et al., 2006).

Agreeableness did not show a significant indirect effect (its confidence interval included zero),  $\beta = 0.06$ , 95% CI [-0.14, 0.61]. It is less common in literature to find agreeableness fully mediated through procrastination; many studies find a direct effect or weaker correlation with procrastination. For example, some studies find that agreeableness correlates negatively with procrastination, but fewer find its effect on procrastination toward academic performance. The meta-analytical research also tends to emphasize conscientiousness as the strongest Big Five predictor. (Kim et al., 2017).

These mediations imply that conscientious, extraverted, and openness to change students tend to manage their time better (lower procrastination), which in turn boosts academic achievement, whereas high neuroticism indirectly lowers grades by increasing procrastination.

## **Conclusion**

This study examined the connection between academic success and personality traits, focusing on procrastination as a behavioral mechanism linking personality to performance. Extraversion, conscientiousness, agreeableness, and openness to new experiences were found to be negatively correlated with procrastination and favorably correlated with scholastic performance. Whereas Neuroticism had a negative correlation with academic achievement and a positive correlation with procrastination.

According to mediation analysis, agreeableness had a direct impact on academic achievement performance without mediation, while extraversion, conscientiousness and openness to change had a partial impact on academic achievement through their effects on procrastination. Whereas, Procrastination completely mediated the association between academic achievement and neuroticism. The results indicate that students with greater degree of neuroticism are more likely to postpone and perform worse academically, in contrast those who are more conscientious, extraverted and openness to change tend to procrastinate less and achieve more academic outcomes. These findings show that behavioral and emotional predispositions in addition to cognitive considerations, influence academic obstacles.

Almost all the results emphasize the significance of putting training and counselling programs will improve self-discipline and time management, specially for students who are disposed to procrastination. Students can better manage their academic burden and accomplish their goals by being encouraged to use strategies that support self-regulation and awareness of individuals variances. Such approaches may be particularly helpful in Pakistani college system, where academic pressure and computation are intense. Overall, this study indicates that student's academic performance can be greatly enhanced by developing personality attributes linked to emotional stability, discipline and goal orientation.

## **Limitations**

This study used self-reported measurements, response predispositions such as social desirability or imperfect memory recall may have an impact. Academic results might have been impacted by other potentially important aspects that were overlooked, such as motivation, learning techniques and environmental impact.

## **Recommendations**

A number of ideas can be made in the light of results and findings. To better explore the unintentional connections between personality traits, procrastination and academic achievement, future research could make use of experimental or longitudinal approaches. Moreover, the results would be more largely applicable if students from greater variety of educational institutions and cultural experiences were added.

## **Implications**

The study highlights procrastination as an important mechanism connecting academic success and personality traits. The results show how individuals variances influence academic outcome, which leads authority to

personality theories. These findings suggest that personality traits of students should be taken into account in academic interferences. Academic performance can be improved by procrastination saving programs, specially for the students who exhibit high neuroticism and low conscientiousness. These understandings can be used by trainers and counsellors to identify students who are facing academic difficulties. Moreover, time management training may help students to perform good academically. These results are applicable to higher education in Pakistan. Overall, the study shows how personality qualities have a big impact on academic achievement.

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