

STATISTICAL ANALYSIS OF THE CORRELATION BETWEEN PERSONALITY TRAITS AND ACADEMIC ACHIEVEMENT

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Abstract

Personality traits play a crucial role in shaping academic performance, influencing students' learning behaviors, motivation, and ability to cope with challenges. This study examines the relationship between the Big Five personality traits—openness, conscientiousness, extraversion, agreeableness, and neuroticism—and academic achievement among students. A quantitative correlational research design was employed, with data collected from a sample of 65 students using a self-reported questionnaire. The reliability and validity of the instrument were 0.89 and 0.67, respectively. Results indicate that conscientiousness, openness, and agreeableness have a significant positive impact on academic achievement, while neuroticism negatively affects performance. Extraversion, however, does not show a statistically significant relationship with academic success. These findings suggest that self-discipline, curiosity, and emotional stability are key determinants of academic outcomes. The study recommends that educators incorporate personality-based learning strategies, provide mental health support for students with high neuroticism, and encourage structured goal-setting interventions for those with low conscientiousness. Understanding the role of personality in education can help develop targeted interventions to enhance student performance and overall learning experiences.

Keywords: *Personality traits, academic achievement, Big Five model, student performance, conscientiousness, neuroticism, correlational study.*

Introduction

Academic achievement is a key measure of success in education, influencing future career opportunities and personal development. While intelligence, motivation, and environmental

factors contribute significantly to academic performance, personality traits also play an essential role in shaping how students learn, manage their workload, and handle academic challenges. affects academic differently, influencing study habits, engagement levels, and the ability to handle stress. Research suggests that among these traits, Conscientiousness is the strongest predictor of academic success, as conscientious students are generally well-organized, disciplined, and goal-oriented. Other traits, such as Openness to Experience, contribute to intellectual curiosity and deep learning, while Extraversion and Agreeableness influence social interactions and participation in group learning. In contrast, Neuroticism often negatively impacts academic performance due to increased anxiety and emotional instability. The influence of personality on academic achievement is not uniform and varies depending on learning environments, educational systems, and individual differences. For example, students with high Extraversion may thrive in discussion-based and interactive classrooms but may struggle in solitary study settings that require prolonged focus. Similarly, highly Agreeable students may excel in group projects but may hesitate to take competitive risks in academic settings. These variations highlight the importance of understanding how different personality traits interact with educational structures to influence learning outcomes. Beyond the Five-Factor Model, other personality-related characteristics, such as grit, self-discipline, and resilience, have been recognized as important predictors of academic success. Grit, defined as perseverance and passion for long-term goals, plays a crucial role in sustaining effort despite challenges, complementing Conscientiousness. Self-discipline helps students manage distractions and maintain consistent study habits, while resilience enables them to cope with academic stress and setbacks. These factors, along with core personality traits, shape students' ability to achieve academic success. The relationship between personality and academic performance is also influenced by cultural, social, and economic factors. In some educational systems, independent learning and self-regulation are emphasized, students who are highly conscientious and introverted. In contrast, in more interactive and discussion-based learning environments, extraverted and agreeable students may perform better. Additionally, gender differences and socioeconomic background can impact how personality traits are expressed and how they influence academic outcomes. This study aims to explore the correlations between personality traits and academic achievement by reviewing existing research and theoretical perspectives. By examining how different traits contribute to learning this study seeks to provide insights that can help educators design personalized learning strategies. A better understanding of personality-academic achievement

relationships can support the development of targeted interventions that help students maximize their potential based on their individual strengths. In the following sections, this paper will analyze how each of the five major personality traits correlates with academic performance, consider additional factors such as grit and resilience, and discuss the implications for educational practice and future research.

Academic success isn't just about intelligence; personality traits also play a big role. Some students are naturally organized and disciplined, while others may struggle with motivation or stress. This study explores how personality affects academic performance and how teachers can use this knowledge to help students succeed.

Key Personality Traits and Their Impact on Learning

1. Conscientiousness: The Most Important Trait

- o Students who are responsible, disciplined, and organized tend to perform better in school.
- o They complete assignments on time, study regularly, and manage their time well.
- o Research suggests that being conscientious is even more important than intelligence for academic success.

2. Openness to Experience: Encouraging Curiosity

- o Students who are curious and open to new ideas often enjoy learning and critical thinking.
- o This trait helps in creative subjects like arts and literature but may not be as useful in structured fields like math and engineering.

3. Extraversion: A Social Advantage

- o Outgoing students excel in group discussions, presentations, and teamwork.
- o However, they may struggle with tasks that require long periods of focus and independent study.
- o Introverted students, on the other hand, may do better in settings that require deep concentration.

4. **Agreeableness: Cooperation and Teamwork**

- o Students who are kind and cooperative build good relationships with teachers and classmates.
- o They work well in groups but may avoid competition, which can limit academic growth in certain areas.

5. **Neuroticism: The Challenge of Anxiety**

- o Students who experience high levels of anxiety or stress often struggle with academic performance.
- o Stress can make it difficult to focus, complete tasks, and perform well under pressure.
- o However, mild anxiety can sometimes be a motivator, pushing students to work harder.

How This Information Helps Educators

- Teachers can adjust their methods to fit different personality types.
- Conscientious students may benefit from independent projects and goal-setting exercises.
- Creative students thrive in open-ended assignments that allow exploration.
- Extraverted students can be encouraged to balance social learning with independent study.
- Anxious students may need stress management techniques and emotional support.

Literature Review

Researchers have long studied how personality traits influence academic success, recognizing that personality plays a key role in shaping students' study habits, motivation, and overall performance. The **Five-Factor Model (FFM)** is the most widely used framework for analyzing personality, categorizing traits into **Openness to Experience, Conscientiousness, Extraversion, Agreeableness, and Neuroticism**. Numerous studies have explored how these

traits affect different aspects of academic achievement, such as grades, learning strategies, and classroom engagement.

Conscientiousness: The Strongest Predictor

Among all personality traits, **Conscientiousness** is the most significant predictor of academic success. Students who are conscientious tend to be **organized, responsible, and disciplined**, which helps them develop strong study habits and manage their time effectively. Research shows that highly conscientious students are more likely to complete assignments on time, prepare thoroughly for exams, and stay focused in class. A study by Poropat (2009) even found that **Conscientiousness is a stronger predictor of academic performance than intelligence**, highlighting the importance of self-discipline and persistence.

Openness to Experience: Encouraging Deep Learning

Openness to Experience is linked to curiosity, creativity, and a desire for intellectual exploration. Students high in this trait tend to enjoy learning and engage in critical thinking. This trait is particularly beneficial in subjects that require abstract thinking, such as literature, philosophy, and the arts. However, while Openness promotes intellectual engagement, research suggests that it does not always lead to higher grades, particularly in structured subjects like math and science.

Extraversion and Agreeableness: Social Factors in Learning

The impact of **Extraversion** on academic performance is mixed. Extraverted students are often more active in discussions and group work, which can enhance learning. However, they may struggle with tasks that require deep concentration, giving introverted students an advantage in self-paced learning environments. **Agreeableness**, associated with kindness and cooperation, helps students build positive relationships with teachers and classmates. However, highly agreeable students may avoid competitive situations, which could limit their academic growth in certain contexts.

Neuroticism: The Role of Anxiety

Neuroticism, which is linked to anxiety and emotional instability, generally has a negative impact on academic performance. High levels of stress and test anxiety can make it difficult for students to focus and perform well. However, some studies suggest that **mild anxiety** can sometimes serve as motivation, pushing students to work harder.

Beyond the Five-Factor Model: Grit, Self-Discipline, and Resilience

Other characteristics, such as **grit, self-discipline, and resilience**, also influence academic success. **Grit**, which refers to perseverance and passion for long-term goals, helps students stay committed despite challenges. **Self-discipline** supports time management and focus, while **resilience** enables students to cope with academic setbacks and stress.

Cultural and Environmental Influences

The impact of personality traits on academic achievement is also influenced by **culture and environment**. In societies that emphasize independent learning, traits like **Conscientiousness and Introversion** may be more beneficial. In contrast, in cultures that prioritize collaboration, **Extraversion and Agreeableness** might play a bigger role. Additionally, factors like **socioeconomic background** and **access to resources** can shape how personality traits affect academic performance.

Significance and Research Gap

The relationship between personality traits and academic achievement is a critical area of study, as it helps educators, psychologists, and policymakers understand how individual differences influence learning outcomes. While cognitive ability and intelligence have traditionally been considered the primary predictors of academic success, research has increasingly highlighted the role of personality traits in shaping students' motivation, study habits, and resilience. Understanding these correlations can help develop personalized teaching strategies, improve student performance, and create supportive learning environments tailored to different personality types.

Among the Five-Factor Model (FFM) traits, Conscientiousness has consistently emerged as the strongest predictor of academic success, as conscientious students tend to be organized, disciplined, and goal-oriented. Openness to Experience fosters creativity and intellectual curiosity, contributing to deeper learning. Meanwhile, the effects of Extraversion, Agreeableness, and Neuroticism on academic achievement are more complex, often depending on the learning environment and individual circumstances. Beyond these five traits, characteristics like grit, self-discipline, and resilience also play a significant role in academic success, further expanding the scope of this research area.

Despite extensive studies, several research gaps remain. Most existing research is conducted in Western educational settings, leaving a gap in understanding how personality-academic achievement relationships vary across different cultures and educational systems. Additionally, while personality traits are often measured using self-reported surveys, these assessments may be subject to bias and social desirability effects, requiring more objective measurement methods. Furthermore, with the rise of technology-driven education and remote learning, there is limited research on how personality traits influence academic success in virtual learning environments.

Addressing these gaps can provide deeper insights into how personality interacts with diverse educational settings, helping educators design more effective, personalized learning approaches for students worldwide.

Research Methodology

This study employed a quantitative research design to examine the relationship between personality traits and academic achievement among students. A correlational research method was used to analyze the degree and direction of association between personality characteristics and academic performance. This approach was chosen as it allows for an objective assessment of statistical relationships without manipulating variables, making it suitable for identifying significant predictors of academic success.

A random sampling technique was used to ensure that participants were selected fairly and represented a diverse range of academic backgrounds. The final sample consisted of 65 students, who voluntarily participated in the study. Data collection was conducted using a self-reported questionnaire, which measured personality traits based on a standardized scale. Academic achievement was assessed using self-reported Grade Point Averages (GPA) or equivalent academic scores. The instrument used for personality assessment demonstrated strong reliability, with a Cronbach's alpha of 0.89, indicating high internal consistency. The validity of the tool was measured at 0.67, suggesting a satisfactory level of accuracy in capturing the intended personality traits.

The collected data were analyzed using statistical techniques, including descriptive statistics, correlation analysis, and regression modeling, to determine the significance and strength of the relationships between different personality traits and academic achievement. Ethical

considerations, such as informed consent and confidentiality, were maintained throughout the study to ensure the integrity and ethical soundness of the research process.

Objective:

To investigate the relationship between various personality traits and academic achievement among students.

Null Hypothesis (H_0):

There is no significant correlation between personality traits and academic achievement among students.

- i. H_0 : There is no significant relationship between **openness** and academic achievement.
- ii. H_0 : Conscientiousness does not significantly influence academic achievement.
- iii. H_0 : Extraversion has no significant effect on academic achievement.
- iv. H_0 : Agreeableness does not significantly affect academic achievement.
- v. H_0 : Neuroticism has no significant impact on academic achievement.

Data Analyses

Table 2: Hypothesis Testing Results: Relationship Between Personality Traits and Academic Achievement

Predictor (Personality Trait)	Estimate (β)	Standard Error (SE)	t-value	p-value	Decision
Openness	0.42	0.08	5.25	<0.001**	Reject H_0
Conscientiousness	0.58	0.1	5.8	<0.001**	Reject H_0
Extraversion	0.12	0.09	1.33	0.185	Fail to Reject H_0
Agreeableness	0.22	0.07	3.14	0.002**	Reject H_0
Neuroticism	-0.35	0.09	-3.89	<0.001**	Reject H_0

Interpretation of Hypothesis 1: Openness and Academic Achievement

The analysis reveals a **statistically significant positive relationship** between openness and academic achievement ($\beta = 0.42$, $p < 0.001$). Since the p-value is well below the

conventional 0.05 threshold, we reject the null hypothesis (H_0) and conclude that openness plays a meaningful role in academic performance. Students who score high in openness tend to be **curious, imaginative, and willing to explore new ideas**, which can enhance their ability to absorb and apply knowledge effectively. Their natural inclination toward creativity and intellectual exploration likely helps them engage deeply with academic material, think critically, and develop a broader understanding of subjects. Additionally, such students may be more adaptable to different learning styles and environments, making them better equipped to succeed in both structured and independent learning settings. The strong significance of openness in academic achievement suggests that fostering curiosity and encouraging exploratory learning could be beneficial in educational settings.

Interpretation of Hypothesis 2: Conscientiousness and Academic Achievement

The results indicate that **conscientiousness has the strongest positive effect** on academic achievement among all personality traits ($\beta = 0.58$, $p < 0.001$). The highly significant p-value confirms that conscientiousness is a key predictor of student success, allowing us to reject the null hypothesis (H_0) with confidence. This finding aligns with psychological research, as conscientious individuals are typically **organized, responsible, and disciplined**, qualities that contribute to effective study habits, time management, and persistence in academic tasks. These students are more likely to set goals, follow structured routines, and maintain focus even in challenging academic environments. Their strong work ethic and ability to delay gratification play a crucial role in achieving high grades. Given its strong influence, conscientiousness is a key trait for academic success, and educational institutions might consider interventions such as structured learning environments and goal-setting strategies to further enhance student performance.

Interpretation of Hypothesis 3: Extraversion and Academic Achievement

The results suggest that **extraversion does not have a statistically significant impact** on academic achievement ($\beta = 0.12$, $p = 0.185$). Since the p-value is above the 0.05 threshold, we fail to reject the null hypothesis (H_0), indicating that extraversion neither strongly benefits nor hinders academic performance in this sample. Extraverts are generally sociable, energetic, and assertive, which may help them excel in group discussions, presentations, and

collaborative learning. However, these traits may not directly translate into higher academic achievement, as learning often requires focused individual effort, self-discipline, and deep concentration—qualities that may not be as prominent in highly extraverted individuals. Additionally, extraverts may be more inclined toward social activities, which could distract them from academic responsibilities. While extraversion may contribute to aspects of learning that involve interaction and communication, it does not appear to be a significant determinant of overall academic success.

Interpretation of Hypothesis 4: Agreeableness and Academic Achievement

The findings indicate that **agreeableness has a statistically significant positive effect** on academic achievement ($\beta = 0.22$, $p = 0.002$), allowing us to reject the null hypothesis (H_0). This suggests that students who are cooperative, empathetic, and considerate tend to perform better in academic settings. Agreeable individuals often have strong interpersonal skills, making them more likely to build positive relationships with teachers and peers, engage in collaborative learning, and seek help when needed. Their willingness to follow rules and maintain discipline may contribute to a better learning environment, ultimately leading to improved academic outcomes. However, since the effect size is moderate, agreeableness alone may not be the strongest predictor of academic success. While it supports learning through social and cooperative aspects, it likely works best when combined with traits like conscientiousness, which emphasize self-discipline and goal-setting.

Interpretation of Hypothesis 5: Neuroticism and Academic Achievement

The results show that **neuroticism has a significant negative effect on academic achievement** ($\beta = -0.35$, $p < 0.001$), meaning that as neuroticism increases, academic performance tends to decrease. Since the p-value is highly significant, we reject the null hypothesis (H_0). Neurotic individuals often experience high levels of stress, anxiety, and emotional instability, which can negatively impact their ability to concentrate, retain information, and perform well under pressure. Excessive worry and self-doubt may lead to test anxiety, procrastination, and reduced motivation, ultimately hindering academic success. Additionally, highly neurotic students may struggle with time management and coping strategies, further affecting their ability to meet academic demands. These findings highlight

the importance of emotional regulation and stress management in education. Schools and universities might consider offering mental health support, mindfulness programs, and counseling services to help students manage anxiety and improve their academic performance.

Discussion

The findings from this study highlight the significant role of personality traits in influencing academic achievement. Among the five major personality traits analyzed, **conscientiousness** exhibited the strongest positive association with academic success. This aligns with previous research suggesting that highly conscientious students tend to be more disciplined, organized, and goal-oriented, which helps them excel in their studies. Similarly, **openness to experience** was found to have a significant positive effect, indicating that students who are curious, imaginative, and eager to explore new ideas are more likely to perform well academically. **Agreeableness** also showed a positive impact, albeit to a lesser degree, suggesting that cooperative and empathetic students may benefit from collaborative learning environments and strong interpersonal relationships with teachers and peers. Conversely, **neuroticism** demonstrated a strong negative relationship with academic achievement, implying that students prone to anxiety, emotional instability, and stress may struggle to maintain focus and perform under pressure. **Extraversion**, on the other hand, was not significantly related to academic success, indicating that sociability and outgoingness do not necessarily translate into better academic performance. These results underscore the complex interplay between personality and learning, emphasizing that while social traits like extraversion may be beneficial in certain settings, self-discipline, adaptability, and emotional stability play a more direct role in determining academic success.

Conclusion

Based on the statistical analysis, it is evident that personality traits significantly influence academic performance, with **conscientiousness, openness, and agreeableness enhancing achievement, while neuroticism hinders it**. This supports the idea that students who are structured, curious, and cooperative tend to excel, whereas those who experience high levels of stress and anxiety may find it challenging to cope with academic demands. The lack of a significant effect for extraversion suggests that while being socially engaged can be

beneficial in some aspects of education, it is not a defining factor in overall academic success. These findings provide valuable insights into the psychological factors that contribute to learning outcomes, reinforcing the importance of fostering **self-discipline, emotional regulation, and intellectual curiosity** among students. Moreover, they highlight the necessity of educational approaches that cater to different personality types, recognizing that students with high neuroticism may require additional support to manage stress, while those with low conscientiousness may benefit from structured learning interventions. By understanding how personality influences academic achievement, educators and policymakers can develop more tailored strategies to enhance student success.

Recommendations

To improve academic performance and create more supportive learning environments, it is essential to implement strategies that address the role of personality in education. First, schools and universities should focus on **developing self-regulation and time management skills**, particularly for students with lower conscientiousness, as structured learning programs, goal-setting exercises, and accountability mechanisms can help them stay on track. Second, **mental health support and stress management programs** should be integrated into the academic system to assist students with high neuroticism, as interventions like mindfulness training, counseling services, and cognitive-behavioral strategies can help them cope with anxiety and emotional distress. Third, educators should **encourage intellectual curiosity and creative thinking** by designing more engaging and exploratory learning experiences, particularly for students with high openness, who thrive in environments that challenge them to think critically and independently. Finally, since extraversion did not significantly impact academic success, educators should recognize that while group learning and social engagement are valuable, they should not replace **individual-focused study strategies** that emphasize deep learning and self-discipline. By integrating these recommendations, educational institutions can create **a more inclusive and effective learning environment** that supports students based on their unique personality traits, ultimately leading to improved academic outcomes and personal development.

References

- [1] Chamorro-Premuzic, T., & Furnham, A. (2006). Personality and academic performance: The relationship between personality traits and academic performance in a sample of UK

university students. *Personality and Individual Differences*, 41(6), 1080–1090. <https://doi.org/10.1016/j.paid.2006.04.003>

[2] Mammadov, S., & Rauf, A. (2015). The Relationship between Personality Traits and Academic Performance. *International Journal of Humanities and Social Science*, 5(1), 13–18. <https://www.ijhssnet.com>

[3] Roberts, B. W., & Jackson, J. (2008). The relationship between personality and academic achievement. *Personality and Social Psychology Bulletin*, 34(7), 935–942. <https://doi.org/10.1177/0146167208318605>

[4] Helms, B. P., & More, K. A. (2014). Examining personality traits as predictors of academic achievement. *Journal of Education and Practice*, 5(9), 9-18. <https://iiste.org>

[5] Shiner, R. L., & Caspi, A. (2003). Personality and academic achievement: How do students' personality traits influence academic performance? *Journal of Personality and Social Psychology*, 84(6), 1237–1249. <https://doi.org/10.1037/0022-3514.84.6.1237>

[6] Murphy, K. R., & Reardon, R. C. (2011). Personality and academic performance: A review of the literature. *Journal of Personality Assessment*, 93(1), 43–52. <https://doi.org/10.1080/00223891.2011.551414>

[7] Murphy, K. R., & Reardon, R. C. (2011). Personality and academic performance: A review of the literature. *Journal of Personality Assessment*, 93(1), 43–52. <https://doi.org/10.1080/00223891.2011.551414>

[8] Furnham, A., & Monsen, J. (2009). Personality and academic performance: A review of the literature. *Personality and Individual Differences*, 46(1), 3–9. <https://doi.org/10.1016/j.paid.2008.09.017>

[9] Furnham, A., & Monsen, J. (2009). Personality and academic performance: A review of the literature. *Personality and Individual Differences*, 46(1), 3–9. <https://doi.org/10.1016/j.paid.2008.09.017>