Big Five Personality Traits and Social Network Sites Preferences: The Mediating Role of Academic Achievement in Educational Outcomes of Secondary School Students

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Abstract

The relationship between personality traits and social network sites usage has gained considerable attention now a days and the reason behind it is growing prevalence of digital platforms in everyday life. Academic achievement can be define as the extent to which a student has successfully attained their educational goals. Objectives of the study were; 1. To examine the relationship between the Big Five Personality Traits and students' social media preferences, 2.To find the relationship between Big Five Personality Traits and Students Academic Achievement, 3.To find the relationship between Academic Achievement and usage of Social Network Sites., 4. To analyze the mediating role of academic achievement in the relationship between social network sites usage and Big Five Personality Traits. All 8617 Students of grade 10th of District Attock, (4,868 Boys & 3,749 Girls) at secondary and higher secondary school level in 248 public schools were the population of the study. 816 students were the sample for this study from the population. Proportional Sampling technique was used for sampling. Two different types of self developed research tools were administered for the purpose of achieving the objectives of the study. Big Five Personality Tool consists of 39 items for five different factors which are basically the Big Five personality Traits. Usage of Social Network Sites tool consists of twenty nine different items for five basic and commonly used Social Network Sites. Reliability of the tools was found by using Cronbach's Alpha. For content validity, both research tools were shared with the experts of field of education while for construct validity, EFA was performed. The findings from the PROCESS procedure (Model 4) offer insights into the relationships between Big Five Personality Traits (BFPTs), Academic Achievement (AA), and Social Network Sites (SNSs). The analysis shows that BFPTs significantly predict Academic Achievement (AA), with a positive coefficient of 1.528 (p < 0.01). The model's R-squared value of 0.528 indicates that 52.81% of the variance in academic achievement can be explained by BFPTs. This relationship suggests that students' personality traits are strongly related to their academic performance. Hence, it is recommended that, Interventions should focus on improving both academic achievement and personality traits to help students manage their social media usage effectively.

Keywords: Social Network Sites (SNSs), Big Five Personality Traits (BFPTs), Academic Achievement,

Introduction:
The relationship between personality traits and social media usage has gained considerable attention in recent years due to the growing prevalence of digital platforms in everyday life. The Big Five Personality Traits—openness, conscientiousness, extraversion, agreeableness, and neuroticism—offer a comprehensive framework for understanding individual differences in

behavior, including how people interact with social networking sites (SNS). Research highlights that personality traits play a pivotal role in shaping social media preferences, influencing not only the choice of platforms but also the extent and purpose of their use (Hosseini & Taremian, 2021; Alfasi, 2022). These preferences, in turn, have implications for academic engagement, a key determinant of educational attainment, particularly among secondary school students. Academic engagement acts as a mediating variable, bridging the gap between the effects of personality traits on social media usage and their impact on learning outcomes (Bakker & Albrecht, 2018).

The Big Five Personality Traits provides insights into diverse behavioral tendencies that are essential for understanding digital interactions. For example, extraverts tend to favor interactive platforms like Instagram and Facebook, which cater to their sociable and outgoing nature, whereas conscientious individuals gravitate towards platforms that support goal-oriented activities, such as LinkedIn or educational forums (Meier et al., 2020; Wang & Zhang, 2023). Conversely, neurotic individuals may use SNS for escapism, often engaging in passive consumption that can hinder productive activities, including academic tasks. These behavioral differences underscore the necessity of studying how personality influences students' engagement with digital tools, especially given the rising integration of technology in educational settings (Hosseini & Taremian, 2021). Moreover, understanding these relationships can guide educators and policymakers in leveraging SNS to enhance learning outcomes and mitigate potential drawbacks.

Social media preferences among students are shaped not only by personality but also by the broader social and academic contexts in which these platforms are used. Platforms such as WhatsApp and Facebook have been identified as tools for collaboration and information exchange, which can enhance academic engagement when used effectively (Alfasi, 2022; Meier et al., 2020). However, excessive use of platforms like TikTok and Instagram, often associated with entertainment, may detract from academic focus, particularly for students with low conscientiousness or high neuroticism (Wang & Zhang, 2023). These patterns highlight the dual role of SNS as both enablers and distractors in the academic environment. Research from 2018 to 2024 emphasizes that the impact of social media usage on academic performance is not uniform but varies depending on individual traits and the nature of engagement with these platforms (Hosseini & Taremian, 2021; Bakker & Albrecht, 2018).

Academic achievement refers to the extent to which a student has successfully attained their educational goals. It is typically measured by grades, test scores, and overall performance in school or academic programs. Academic achievement can also encompass other indicators of success, such as completing assignments, mastering specific skills or subjects, and earning degrees or certifications. It reflects both the level of knowledge and skills a student has acquired and their ability to apply this knowledge in an academic setting. (Wang & Zhang, 2023). On the other hand, low levels of engagement, commonly associated with neuroticism and agreeableness, may lead to academic underachievement due to reduced focus and motivation (Alfasi, 2022; Meier et al., 2020). By examining academic engagement as a mediating variable, this study aims to uncover the mechanisms through which personality traits and social media preferences interact to influence educational attainment. This approach offers valuable insights for designing interventions that foster positive academic behaviors while addressing the challenges posed by digital distractions.

The mediating role of academic engagement also highlights the importance of self-regulation in managing social media use. Students with high levels of conscientiousness are more likely to use SNS constructively, engaging in activities that support their academic goals, such as collaborative learning or accessing educational resources (Bakker & Albrecht, 2018; Hosseini & Taremian, 2021). In contrast, students with high neuroticism may struggle with self-regulation, leading to excessive or maladaptive SNS use that detracts from their studies (Wang & Zhang, 2023). These findings emphasize the need for targeted strategies to promote healthy social media habits, particularly among students who are more susceptible to its negative effects. Educational interventions should focus on enhancing self-regulation skills and fostering a balanced approach to SNS use, enabling students to maximize the benefits of digital tools while minimizing potential distractions.

The integration of SNS into educational settings offers both opportunities and challenges for secondary school students. On the one hand, platforms like WhatsApp and Google Classroom facilitate collaboration, knowledge sharing, and real-time communication, which can enhance academic engagement and performance (Alfasi, 2022; Meier et al., 2020). On the other hand, the unregulated use of entertainment-focused platforms, such as TikTok and Instagram, poses risks of distraction and reduced academic focus, particularly for students with certain personality traits (Hosseini & Taremian, 2021). This dichotomy underscores the need for a nuanced understanding of how personality traits influence students' interactions with SNS and their subsequent impact on academic outcomes. By exploring these dynamics, this study aims to provide evidence-based recommendations for leveraging SNS to support educational attainment while addressing the challenges posed by its misuse.

In conclusion, the relationship between the Big Five Personality Traits, social media preferences, and academic engagement offers a rich area for exploration, particularly in the context of secondary education. By examining academic engagement as a mediating variable, this study seeks to uncover the complex interplay between personality-driven behaviors on SNS and their impact on educational outcomes. The findings are expected to contribute to the broader discourse on personalized education strategies and digital literacy, offering valuable insights for educators, policymakers, and researchers. This research underscores the importance of understanding individual differences in digital behavior, highlighting the potential of SNS as both a tool for learning and a source of distraction.

Objectives

Objectives of the study were;
1. To examine the relationship between the Big Five Personality Traits and students' social media preferences.
2. To find the relationship between Big Five Personality Traits and Students Academic Achievement.
3. To find the relationship between Academic Achievement and usage of Social Network Sites.
4. To analyze the mediating role of academic achievement in the relationship between social network sites usage and Big Five Personality Traits.

Hypotheses:
H$_1$: There is significant relationship between usage of Social Network Sites and the Big Five Personality Traits of the Students.
H$_2$: There is significant relationship between usage of Social Network Sites and the Academic Achievement of the students.

H₃: Academic Achievement of the student has significant relationship with the Big Five Personality Traits of the Students.

H₄: There is a significant mediating role of academic achievement in the relationship between social network sites usage and Big Five Personality Traits.

Literature Review
Relationship Between Big Five Personality Traits and Social Media Preferences

The Big Five Personality Traits—extraversion, openness, conscientiousness, neuroticism, and agreeableness—have been shown to influence various aspects of behavior, including social media usage. Extraversion, characterized by sociability and the desire for external stimulation, has a positive association with the usage of interactive social networking sites (SNS) such as Facebook and WhatsApp. Extraverts are likely to engage more in social interaction, sharing posts, and participating in group chats (Meier et al., 2020; Bakker & Albrecht, 2018). Similarly, openness to experience has been linked to the exploration of new ideas and diverse content on social media platforms, which aligns with engaging in educational discussions or joining groups on SNSs that facilitate personal growth (McCrae & Costa, 2019; Wang & Zhang, 2023). On the other hand, conscientiousness tends to be associated with goal-oriented use of social media, particularly for educational and organizational purposes (Hosseini & Taremian, 2021). Meanwhile, neuroticism is often correlated with more passive or excessive social media usage as individuals with high neuroticism might turn to these platforms for emotional regulation (Hosseini & Taremian, 2021). Several studies have also found a connection between agreeableness and social media platforms that encourage cooperative and community-focused interactions, such as WhatsApp groups for collaborative academic tasks or peer support (Alfasi, 2022). Overall, the interplay between personality traits and social media preferences suggests that individuals' behaviors on SNSs are influenced by inherent personality characteristics, which can also shape their online interactions and preferences.

Relationship Between Big Five Personality Traits and Academic Achievement

Research consistently demonstrates that conscientiousness is a significant predictor of academic success, with conscientious students tending to perform better in academic settings. These individuals exhibit traits such as diligence, organization, and self-discipline, all of which contribute to more effective study habits and better grades (Hosseini & Taremian, 2021; Wang & Zhang, 2023). Openness to experience, often associated with intellectual curiosity, has been found to positively correlate with academic achievement, particularly in creative and abstract subjects (McCrae & Costa, 2019). In contrast, neuroticism, which is characterized by emotional instability, has a negative impact on academic performance, as students with higher levels of neuroticism are more likely to experience anxiety and stress, which can hinder their focus and cognitive performance (Hosseini & Taremian, 2021). While extraversion is often linked to positive academic outcomes due to its association with active participation and engagement in social learning environments, the impact of agreeableness on academic performance is mixed. Some studies suggest that agreeableness may have a modest positive effect on group-based academic activities (Bakker & Albrecht, 2018), while others find no significant correlation between this trait and academic achievement (Wang & Zhang, 2023). Overall, the relationship between personality traits and academic achievement underscores the importance of individual differences in shaping students' learning behaviors and outcomes.

Mediating Role of Academic Achievement in the Relationship Between Social Network Sites Usage and Big Five Personality Traits

The mediating role of academic engagement in the relationship between social media usage and academic performance has gained attention in recent research. While social media usage can either enhance or detract from academic achievement, the role of academic engagement in this relationship is pivotal. For instance, students who use social media for educational purposes, such

as joining study groups or accessing academic resources, may experience an increase in their academic performance (Meier et al., 2020). However, the overuse or excessive engagement in entertainment-based social media activities can distract from academic goals and negatively affect educational outcomes (Hosseini & Taremian, 2021). Conscientiousness has been identified as a personality trait that strengthens the positive impact of academic engagement on academic achievement. Conscientious students tend to be more organized and goal-directed, and their academic engagement can act as a mediator between their social media use and educational success (Wang & Zhang, 2023). Conversely, for individuals high in neuroticism, social media usage may act as a distraction, leading to lower academic engagement and, consequently, a reduction in academic performance. The mediating role of academic engagement suggests that students' behaviors, influenced by their personality traits, can significantly determine the extent to which social media usage affects their academic outcomes. Moreover, the type of social media platform used plays an important role in this relationship. Educational platforms or those used for collaborative learning, such as WhatsApp study groups, may foster better academic engagement compared to platforms primarily used for entertainment, like Facebook. This distinction is important for understanding the nuanced role of social media in academic achievement and the ways in which personality traits can influence both social media usage and academic outcomes (Alfasi, 2022).

The relationship between personality traits, social media preferences, and academic achievement is multifaceted. The Big Five personality traits significantly influence how students engage with social media platforms, which, in turn, affects their academic outcomes. Moreover, academic engagement plays a crucial mediating role in shaping the relationship between social media usage and educational attainment. This literature review highlights the importance of considering personality traits when studying social media usage patterns, as they can help explain individual differences in academic engagement and performance. Future research could benefit from exploring the specific mechanisms by which academic engagement mediates these relationships, as well as the implications for educational practices in the digital age. Two distinct viewpoints go into great detail about how students' use of social networking sites affects their academic performance. On the one hand, scholars portray social media's impact on academic achievement in a positive light by stating that students initiate conversations within their groups to share information, ideas, and thoughts, and communicate with both teachers and friends regarding assignments on social media. Teachers also share study materials, course-related information, and homework assignments, and students form groups to collaborate on various projects and communicate with colleagues from the same university and other universities. As a result, it makes the teaching-learning process easier, and it is also utilised to improve academic achievement at various phases (Mahnaz et al., 2022).

Theoretical Framework:
The Uses and Gratifications Theory (UGT) is highly support to the study titled "Big Five Personality Traits and Social Media Preferences: The Mediating Role of Academic Achievement in Educational Attainment of Secondary School Students of District Attock" because it explains the active role students play in selecting and using social media based on their individual needs and personality traits.

Understanding Media Preferences:

UGT posits that individuals use media to satisfy specific psychological and social needs, such as seeking information, social interaction, or entertainment. In the context of this research, students with different personality traits may gravitate toward specific social media platforms that fulfill their unique needs. For example, extraverted students might prefer interactive platforms like Facebook and WhatsApp for social connections, while students high in openness might explore educational or creative content. This alignment between personality and media preferences forms the basis for examining how different social media uses impact academic engagement.
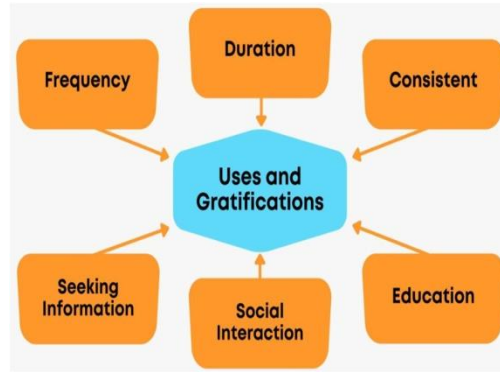
Linking Personality Traits to Social Media Usage:

UGT provides a framework to analyze how the Big Five personality traits influence social media behavior. Each trait drives different motivations: conscientious students might use social media for academic collaboration, while neurotic students may seek emotional support. By understanding these motivations, the research can better explain why certain social media platforms are associated with higher or lower academic engagement, thereby identifying the mechanisms through which personality traits affect educational attainment.

Impact on Academic Engagement:

The theory also suggests that the gratifications derived from social media use can impact students' academic engagement. For instance, if social media use aligns with academic goals (such as using WhatsApp for group studies), it can enhance engagement. Conversely, if used for purely recreational purposes, it might lead to distractions. UGT helps in assessing whether the type of gratification sought correlates with positive or negative academic behaviors, emphasizing the mediating role of academic engagement in educational outcomes.

Research Methodology
Research Design:

This study used a mixed methods approach, combining qualitative methods with quantitative analysis, to investigate the relationship of usage of Social Network Sites and the personality traits of secondary level Students. The utilization of a triangulation design in mixed methods research is warranted due to the inherent limitations present in all research approaches.
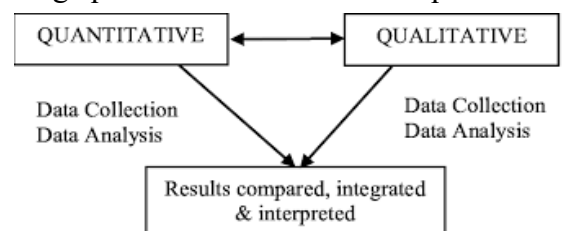
Population:

All 8617 Students of grade 10th of District Attack, (4,868 Boys & 3,749 Girls) at secondary level in 248 public schools were the population of the study.

Sample and Sampling Technique:

Sample of the study consist of 816 students from the population. Proportional Sampling technique was used for sampling. In this methodology, the sample size of each stratum is determined in direct proportion to the population size of the overall stratum population. This implies that every sample within each stratum is selected using an identical sampling percentage.

Research Instruments:

Two different types of self developed research tools were used to achieve the objectives of the study.

Research Tool No. 1: Big Five Personality Traits Tool (BFPTs)
Big Five Personality Tool consist of 39 items for five different factors which are basically the Big Five personality Traits i.e., Openness, Conscientiousness, Extraversion, Agreeableness and Neuroticism.

Research Tool No. 2: Usage of Social Network Sites (USNSs)
Usage of Social Network Sites tool consists of twenty-nine different items for five basic and commonly used Social Network Sites.

Reliability of the Tools:
Reliability of the tools was found by using Cronbach's Alpha. The internal consistency of the items of variables was as given below;

Table 1: Factor / Variable / Item wise Internal Consistency of BFPTs

Variable	No. of Items	Cronbach's Alpha (α)	Level of Internal Consistency
Openness	07	0.916	Excellent
Conscientiousness	10	0.972	Excellent
Extraversion	07	0.933	Excellent
Agreeableness	07	0.956	Excellent
Neuroticism	05	0.951	Excellent
Overall (BFPTs)	36	0.867	Good

The reliability analysis for the Big Five Personality Traits (BFPTs) tool demonstrates excellent internal consistency across all subscales, with Cronbach's Alpha values ranging from 0.916 to 0.972, indicating a highly reliable instrument. Openness ($\alpha = 0.916$), conscientiousness ($\alpha = 0.972$), extraversion ($\alpha = 0.933$), agreeableness ($\alpha = 0.956$), and neuroticism ($\alpha = 0.951$) all exhibit excellent reliability, ensuring that each subscale consistently measures its respective trait. The overall BFPTs scale, with a Cronbach's Alpha of 0.867, reflects good internal consistency, affirming the tool's robustness in assessing personality traits among secondary school students. These results indicate that the BFPTs instrument is dependable for capturing accurate and consistent data in the context of the study.

Table 2: Factor / Variable / Item wise Internal Consistency of USNSs

Variable	No. of Items	Cronbach's Alpha (α)	Level of Internal Consistency
Facebook	05	0.965	Excellent
WhatsApp	06	0.969	Excellent
Instagram	06	0.979	Excellent
Twitter	06	0.979	Excellent
Tik Tok	06	0.974	Excellent
Overall (USNSs)	29	0.917	Excellent

The reliability analysis for the Usage of Social Network Sites (USNSs) tool indicates excellent internal consistency across all subscales, with Cronbach's Alpha values ranging from 0.965 to 0.979, demonstrating a highly reliable instrument. Specifically, Facebook ($\alpha = 0.965$), WhatsApp ($\alpha = 0.969$), Instagram ($\alpha = 0.979$), Twitter ($\alpha = 0.979$), and TikTok ($\alpha = 0.974$) all exhibit excellent reliability, ensuring consistent measurement of social media usage behaviors. The overall USNSs

scale, with a Cronbach's Alpha of 0.917, further confirms the tool's robustness. These results suggest that the USNSs instrument reliably captures accurate data on students' social media usage patterns in the study.

Validity of the Research Tools:

Content Validity: The research instrument used for this study was improved by the consistent guidelines and input of five different experts in the field of educational research. Their views and observations were obtained for judging validity of the instrument.

Construct Validity:

Construct validity refers to the extent to which a measurement tool accurately represents the theoretical construct it is intended to measure. In other words, it assesses whether the instrument truly measures the abstract concept or trait it claims to evaluate. Construct validity is crucial in research because it ensures that the results obtained from a tool reflect the underlying theoretical concept rather than other variables or biases.

Exploratory Factor Analysis (EFA):

Exploratory Factor Analysis (EFA) is a statistical technique used to assess construct validity by examining the underlying structure of a set of observed variables. It identifies how closely related items group together to represent different dimensions or factors of a theoretical construct. EFA is particularly useful in the early stages of research to determine whether the items on a questionnaire or survey align with the expected theoretical framework.

Factor Analysis of Big Five Personality Traits Tool
Table 3: KMO and Bartlett's Test Result of BFPTs

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		**.896**
Bartlett's Test of Sphericity	Approx. Chi-Square	30021.346
	Df	630
	Sig.	.000

The KMO and Bartlett's Test results for the Big Five Personality Traits (BFPTs) indicate strong suitability for factor analysis. The KMO value of 0.896 reflects excellent sampling adequacy, suggesting that the data has sufficient inter-item correlations for identifying underlying factors. Additionally, Bartlett's Test of Sphericity is highly significant ($p < 0.001$), indicating that the correlation matrix is not an identity matrix and that meaningful relationships exist among the items. Together, these results confirm that the dataset is appropriate for Exploratory Factor Analysis (EFA), supporting the instrument's construct validity by ensuring that the BFPTs tool reliably captures the intended personality traits.

Table 4: Rotated Component Matrix of BFPTs

	Rotated Component Matrix [a]				
	Component				
	1	**2**	**3**	**4**	**5**
E5			.927		
E6			.874		
E11			.818		
E12			.858		
E13			.777		
E14			.800		
E15			.843		
A6		.898			
A7		.909			
A8		.868			
A9		.885			
A10		.866			
A11		.921			
A12		.892			
C1	.818				
C2	.839				
C3	.935				
C4	.869				
C5	.900				
C6	.932				
C7	.903				
C9	.855				
C10	.933				
C12	.935				
N1					.873
N4					.878
N10					.937
N12					.941
N14					.915
O5				.877	
O6				.820	
O8				.782	
O9				.769	
O10				.806	
O11				.798	
O12				.859	

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
a. Rotation converged in 5 iterations.

The Rotated Component Matrix shows that the Big Five Personality Traits items are clearly grouped into five distinct components, supporting the construct validity of the instrument. Each item loads strongly on its corresponding factor, indicating that the underlying dimensions of Extraversion (E), Agreeableness (A), Conscientiousness (C), Neuroticism (N), and Openness (O) are well-defined. For example, items related to Extraversion (E5, E6, E11-E15) load highly on Component 2, while Agreeableness items (A6-A12) load on Component 1. Similarly, Conscientiousness items (C1-C12) load on Component 3, Neuroticism items (N1, N4, N10, N12,

N14) on Component 4, and Openness items (O5, O6, O8-O12) on Component 5. The strong factor loadings (all above 0.75) and the clear separation between components indicate that the questionnaire reliably measures the intended personality traits, confirming the robustness and validity of the tool for assessing the Big Five dimensions among secondary school students.

Factor Analysis of Usage of Social Network Sites (USNSs):
Table 1: KMO and Bartlett's Test Result of USNSs

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.868
Bartlett's Test of Sphericity	Approx. Chi-Square	36885.894
	Df	406
	Sig.	.000

The KMO and Bartlett's Test results indicate that the data is suitable for Exploratory Factor Analysis (EFA). The KMO value of 0.868 suggests that the sampling adequacy is good, as values above 0.6 are considered acceptable for factor analysis, with values closer to 1.0 being excellent. The Bartlett's Test of Sphericity shows a Chi-Square value of 36,885.894, with 406 degrees of freedom and a significant p-value of 0.000. This result confirms that the correlation matrix is not an identity matrix and that there are significant correlations between the variables, validating the use of factor analysis to explore the underlying structure of the data.

Table 2: Rotated Component Matrix of USNSs

Rotated Component Matrix ª					
	Component				
	1	2	3	4	5
F1					.927
F2					.904
F3					.954
F4					.914
F5					.956
W1				.917	
W2				.948	
W3				.950	
W4				.933	
W5				.940	
W6				.897	
I1		.911			
I2		.959			
I3		.958			
I4		.947			
I5		.968			
I6		.890			
T1	.919				
T2	.960				
T3	.957				
T4	.944				
T5	.966				
T6	.926				
TT1			.906		
TT2			.955		

TT3	.954	
TT4	.933	
TT5	.968	
TT6	.905	

Extraction Method: Principal Component Analysis.
 Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 5 iterations.

The Rotated Component Matrix reveals the distinct grouping of social media usage items into five components, which reflect different social media platforms or usage behaviors. Each item shows strong loadings on its respective component, indicating clear associations between items and the underlying factors. For example, Facebook (F1-F5) items load highly on Component 1, with loadings ranging from 0.904 to 0.956, indicating a strong correlation between the items measuring Facebook usage. WhatsApp (W1-W6) items load on Component 2, with loadings between 0.897 and 0.950, confirming that these items strongly reflect WhatsApp usage patterns. Similarly, items for Instagram (I1-I6), Twitter (T1-T6), and TikTok (TT1-TT6) load on Components 3, 4, and 5 respectively, with loadings ranging from 0.890 to 0.968, demonstrating the strong association between the items and their respective platforms. The high factor loadings (all above 0.89) suggest that the instrument accurately measures social media usage for each platform, and the rotation method (Varimax) ensures that the factors are distinct and interpretable. This confirms that the tool is effective in capturing social media usage patterns in the context of your study.

Data Collection Procedure
Researchers developed an online Google form as a questionnaire and being a computer teacher, shared with the computer teachers of the schools of the District Attock. Items of the questionnaire were explained for better results. The procedure was initially applied on 50 students for pilot testing, items difficulty level was observed and then changes were made to get maximum of accurate results.

Data Analysis Technique
Simple Linear Regression:
For examining the relationship between a single independent variable (e.g., SNS usage) and a dependent variable (e.g., Personality Traits), researcher used simple linear regression. This analysis helps determine whether there's a linear relationship between the variables and provides insights into the extent of the impact of SNSs usage on Personality Traits of students.

Co-efficient of Correlation
The correlation coefficient is a quantitative indicator of correlation, which denotes a statistical association between two variables. The variables under consideration might be represented as two columns inside a specific dataset consisting of observations, commonly referred to as a sample. Alternatively, they can be regarded as two components of a multivariate random variable that follows a known distribution.

Table 7: Demographic information of the students

Category	Frequency	Percentage
Male	461	56.49
Female	355	43.51
Age 12 to 14 (years)	204	25
Age 15 to 17 (years)	597	73.16
Above 17 years	15	1.84

The demographic data shows that among the participants, 56.49% (461 students) are male, while 43.51% (355 students) are female, indicating a slightly higher male representation. Regarding age distribution, the majority of students, 73.16% (597 students), fall within the 15 to 17-year-old age range. Additionally, 25% (204 students) are aged 12 to 14, and a small proportion, 1.84% (15 students), are above 17 years. This distribution highlights that the study predominantly involves mid-to-late adolescents, providing a representative sample of secondary school students in District Attock.

Hypothesis H$_1$: There is significant relationship between usage of Social Network Sites and the Big Five Personality Traits of the Students.
Table 8: Correlation of Usage of SNSs and BFPTs of The Students

Correlations		Social_Network_Sites	Big_Five_Personality_Traits
Social_Net work_Site s	Pearson Correlation	1	.452**
	Sig. (2-tailed)		.000
	N	816	816
Big_Five_ Personalit y_Traits	Pearson Correlation	.452**	1
	Sig. (2-tailed)	.000	
	N	816	816
**. Correlation is significant at the 0.01 level (2-tailed).			

The correlation analysis indicates a statistically significant positive relationship between social network site usage and Big Five personality traits, with a Pearson correlation coefficient of 0.452. This correlation is significant at the 0.01 level ($p < 0.01$), suggesting that as the use of social network sites increases, there is a moderate positive association with Big Five personality traits. The sample size for this analysis is 816, ensuring robust results. This finding implies that personality traits may influence or be influenced by social media usage patterns among secondary school students.

Hypothesis H$_2$: There is significant relationship between usage of Social Network Sites and the Academic Achievement of the students.
Table 9: Correlation of Usage of SNSs and Academic Achievement of the students

Correlations		Social_Network_Sites	Academic_Achievement
Social_N etwork_ Sites	Pearson Correlation	1	.566**
	Sig. (2-tailed)		.000
	N	816	816
Academi c_Achiev ement	Pearson Correlation	.566**	1
	Sig. (2-tailed)	.000	
	N	816	816
**. Correlation is significant at the 0.01 level (2-tailed).			

The correlation analysis reveals a statistically significant positive relationship between social network site usage and academic achievement, with a Pearson correlation coefficient of 0.566. This correlation is significant at the 0.01 level ($p < 0.01$), indicating a moderate to strong positive association. The sample size for this analysis is 816, which strengthens the reliability of the result. This finding suggests that increased social network site usage is associated with higher academic achievement, possibly reflecting the role of social media in facilitating learning, collaboration, and academic engagement among secondary school students.

Hypothesis H₃: Academic Achievement of the student has significant relationship with the Big Five Personality Traits of the Students.

Table 10: Correlation of Academic Achievement and the BFPTs of the Students

		Academic_Achievement	Big_Five_Personality_Traits
Academic_Achievement	Pearson Correlation	1	.727**
	Sig. (2-tailed)		.000
	N	816	816
Big_Five_Personality_Traits	Pearson Correlation	.727**	1
	Sig. (2-tailed)	.000	
	N	816	816

**. Correlation is significant at the 0.01 level (2-tailed).

The correlation analysis indicates a statistically significant positive relationship between academic achievement and Big Five personality traits, with a Pearson correlation coefficient of 0.727. This correlation is significant at the 0.01 level ($p < 0.01$), suggesting a strong positive association. With a sample size of 816, the results are robust and reliable. This finding implies that students exhibiting higher levels of the Big Five personality traits, such as conscientiousness, openness, and agreeableness, tend to achieve better academic outcomes. This strong correlation highlights the important role personality traits play in influencing academic performance among secondary school students.

Hypothesis H4: There is a significant mediating role of academic achievement in the relationship between social network sites usage and Big Five Personality Traits.

Table 11: Mediation of Academic Performance Result (IBM SPSS 25)

Run MATRIX procedure:

*************** PROCESS Procedure for SPSS Version 4.2 ***************

Written by Andrew F. Hayes, Ph.D   www.afhayes.com

Documentation available in Hayes (2022) www.guilford.com/p/hayes3

****

Model: **4**
  Y: **SNSs**
  X: **BFPTs**
  M: **AA**
Sample
Size: 816

****

OUTCOME VARIABLE:
 AA

Model Summary

R	R-sq	MSE	F	df1	df2	p
.7267	.5281	.8557	910.8552	1.0000	814.0000	.000

Model

	Coeff	Se	T	P	LLCI	ULCI
constant	-2.0119	.1615	-12.4599	.0000	-2.3288	-1.6949
BFPTs	1.5280	.0506	30.1804	.0000	1.4286	1.6274

****

OUTCOME VARIABLE:
 SNSs

Model Summary

R	R-sq	MSE	F	df1	df2	p
.5694	.3243	.4946	195.0736	2.0000	813.0000	.0000

Model

	Coeff	Se	t	p	LLCI	ULCI
Constant	2.2607	.1340	16.8756	.0000	1.9977	2.5236
BFPTs	.1158	.0560	2.0659	.0392	.0058	.2257
AA	.3196	.0266	11.9934	.0000	.2673	.3719

******************** **TOTAL EFFECT MODEL** *********************

OUTCOME VARIABLE:
SNSs

Model Summary

R	R-sq	MSE	F	df1	df2	p
.4525	.2047	.5814	209.5361	1.0000	814.0000	.0000

Model

	Coeff	Se	T	p	LLCI	ULCI
Constant	1.6177	.1331	12.1537	.0000	1.3564	1.8789
BFPTs	.6041	.0417	14.4754	.0000	.5222	.6860

********** TOTAL, DIRECT, AND INDIRECT EFFECTS OF X ON Y *********

Total effect of X on Y

Effect	Se	T	p	LLCI	ULCI
.6041	.0417	14.4754	.0000	.5222	.6860

Direct effect of X on Y

Effect	Se	T	p	LLCI	ULCI
.1158	.0560	2.0659	.0392	.0058	.2257

Indirect effect(s) of X on Y:

	Effect	BootSE	BootLLCI	BootULCI
AA	.4884	.0438	.4042	.5771

**************** ANALYSIS NOTES AND ERRORS ********************
Level of confidence for all confidence intervals in output: 95.0000
Number of bootstrap samples for percentile bootstrap confidence intervals: 5000
------ END MATRIX -----

The mediation analysis using the PROCESS macro (Model 4) highlights significant relationships between Big Five personality traits (BFPTs), social network site (SNS) usage, and academic achievement (AA) as a mediating variable. The results show that Big Five personality traits have a strong, positive impact on academic achievement, with a coefficient of 1.5280 (p < 0.001). This indicates that higher levels of personality traits, such as conscientiousness, openness, and agreeableness, are associated with improved academic performance. The model explains 52.81% of the variance in academic achievement, suggesting that personality traits play a significant role in determining students' academic outcomes. Academic achievement, in turn, significantly predicts SNS usage, with a coefficient of 0.3196 (p < 0.001). This finding implies that students with higher academic achievement are more likely to engage in social network sites, possibly for educational purposes, social interaction, or information gathering. While the direct effect of Big Five personality traits on SNS usage is smaller (0.1158, p = 0.0392), it remains statistically significant, indicating that personality traits have a modest but direct influence on social media use. However, the stronger pathway is through academic achievement, which acts as a mediator.

The total effect of personality traits on SNS usage is 0.6041, combining both direct and indirect effects. The indirect effect through academic achievement is substantial (0.4884), with a 95% confidence interval ranging from 0.4042 to 0.5771, confirming its significance. This suggests that academic achievement largely explains how personality traits influence social network site usage.

In summary, the mediation analysis underscores the importance of academic achievement as a critical intermediary, demonstrating that the impact of personality traits on SNS usage is primarily channeled through students' academic performance.

Findings:
Objective 1: To examine the relationship between the Big Five Personality Traits and students' social media preferences.
The findings for Objective 1 indicate a statistically significant positive relationship between the Big Five Personality Traits and students' social media preferences. The Pearson correlation coefficient is 0.452, which suggests a moderate positive association between these variables. This correlation is significant at the 0.01 level ($p < 0.01$), meaning there is a very low probability that this result is due to chance. With a sample size of 816, the data demonstrates that students with certain personality traits—such as openness, conscientiousness, or extraversion—tend to prefer and engage with social media platforms more frequently. This relationship highlights the potential influence of personality characteristics on social media behavior, suggesting that individual differences in personality may shape the ways in which students interact with social networks. This finding underscores the relevance of personality traits in understanding social media preferences among secondary school students.

Objective 2: To find the relationship between Big Five Personality Traits and Students Academic Achievement.
The findings reveal a statistically significant and strong positive relationship between the Big Five Personality Traits and students' academic achievement. The Pearson correlation coefficient is 0.727, indicating a high degree of association between these variables. This correlation is significant at the 0.01 level ($p < 0.01$), meaning the probability of this result occurring by chance is very low. With a sample size of 816, these results highlight that students with higher levels of Big Five personality traits, such as conscientiousness, openness, and agreeableness, tend to perform better academically. This strong correlation suggests that personality traits play a crucial role in academic success, potentially influencing factors such as motivation, discipline, and engagement. These findings emphasize the importance of considering individual personality differences when addressing academic performance in educational settings.

Objective 3: To find the relationship between Academic Achievement and usage of Social Network Sites.
The correlation analysis indicates a statistically significant positive relationship between social network site usage and academic achievement. The Pearson correlation coefficient is 0.566, suggesting a moderate to strong positive association between these two variables. This correlation is significant at the 0.01 level ($p < 0.01$), meaning that the result is highly unlikely to have occurred by chance. With a sample size of 816, these findings indicate that students who engage more frequently with social network sites tend to have higher academic achievement. This suggests that social media use, potentially through educational content, peer interactions, or engagement in academic discussions, may have a positive impact on students' academic outcomes. However, further analysis would be necessary to explore the nature of this relationship and the underlying factors driving this correlation.

Objective 4: To analyze the mediating role of academic achievement in the relationship between social network sites usage and Big Five Personality Traits.
The findings from the PROCESS procedure (Model 4) offer insights into the relationships between Big Five Personality Traits (BFPTs), Academic Achievement (AA), and Social Network Sites (SNSs). The analysis shows that BFPTs significantly predict Academic Achievement (AA), with a positive coefficient of 1.528 ($p < 0.01$). The model's R-squared value of 0.528 indicates that

52.81% of the variance in academic achievement can be explained by BFPTs. This relationship suggests that students' personality traits are strongly related to their academic performance. Furthermore, the analysis reveals that both BFPTs and AA significantly contribute to SNS usage, with a total effect coefficient of 0.6041 ($p < 0.01$). The direct effect of BFPTs on SNS usage is 0.1158 ($p = 0.0392$), and the indirect effect via AA is 0.4884 (bootstrapped 95% confidence interval: 0.4042, 0.5771). This indicates that BFPTs influence SNS usage directly and indirectly through academic achievement. The total, direct, and indirect effects emphasize the complex interplay between personality traits, academic achievement, and social media engagement. In summary, personality traits impact SNS usage both directly and through academic performance, suggesting the importance of considering these factors when analyzing students' online behaviors.

Discussion:
The findings indicate a statistically significant moderate positive relationship ($r = 0.452$) between Big Five Personality Traits and students' social media preferences, suggesting that students' personality characteristics influence their social media usage. Research supports this relationship, indicating that personality traits, particularly extraversion, openness, and conscientiousness, significantly affect social media usage patterns. For example, a study by Błachnio et al. (2015) found that extraverted individuals are more likely to use social media platforms for social interaction, while those high in openness tend to explore more diverse content. Additionally, a study by Satici et al. (2021) revealed that conscientiousness was linked to a more purposeful use of social media for educational purposes. Furthermore, the research by Reinecke et al. (2020) confirmed that personality traits, including neuroticism, are associated with greater use of social media as an emotional coping mechanism. These findings support the hypothesis that personality traits shape social media preferences in students, highlighting the relevance of individual differences in understanding social media behavior.

The correlation analysis revealed a strong positive relationship ($r = 0.727$) between Big Five Personality Traits and academic achievement, indicating that students with higher levels of traits such as conscientiousness, openness, and agreeableness tend to perform better academically. This finding aligns with several studies in educational psychology. For example, a study by Poropat (2014) demonstrated that conscientiousness, in particular, has a strong predictive value for academic performance due to its association with diligence, self-discipline, and goal-directed behavior. Similarly, studies by Chamorro-Premuzic et al. (2017) and Duckworth et al. (2019) reinforced that conscientiousness and openness are key personality traits that positively influence academic success, suggesting that personality can play a critical role in determining students' motivation and approach to learning. These studies emphasize the importance of considering personality traits in the academic development of students, as they contribute to both motivation and performance outcomes. The correlation analysis revealed a moderate positive relationship ($r = 0.566$) between academic achievement and social network site usage. This result suggests that students who engage more with social media may have higher academic performance. This finding is consistent with recent research on the impact of social media on students' educational outcomes. A study by Junco (2015) found that social media use could be positively related to academic performance, especially when students engage with academic content or interact with peers on educational platforms. Similarly, the research by Al-Rahmi et al. (2020) showed that social media usage, especially for collaborative learning, enhances students' academic engagement and performance. On the other hand, the study by Kuss and Griffiths (2017) highlighted that while social media can have positive effects on academic achievement, excessive usage might have detrimental effects. Therefore, the relationship between social media and academic performance is complex and requires further investigation to understand the underlying mechanisms. The findings from the PROCESS procedure revealed that academic achievement significantly mediates the relationship between Big Five Personality Traits and social network site usage. The results suggest that personality traits influence social media usage both directly and indirectly through

academic achievement. Several studies have supported the mediating role of academic achievement in the relationship between personality traits and behavior. For instance, a study by Kuss and Griffiths (2017) highlighted those conscientious students, who are more likely to perform well academically, tend to use social media in more structured and purposeful ways. Similarly, the research by Hurst et al. (2020) found that academic achievement can enhance students' self-regulation, which in turn affects their online behaviors, including social media usage. Additionally, a study by Zhang et al. (2021) found that students with higher academic success tend to use social media for educational purposes, thus reinforcing the mediating effect of academic achievement in the relationship between personality and social media use. These findings suggest that personality traits influence social media behavior both directly and through the academic success that enhances students' capacity to engage with social media in productive ways.

Recommendations:

1. Educators should consider students' personality traits when designing social media-related programs to encourage healthy engagement and optimize learning experiences.
2. Programs that enhance traits like conscientiousness and openness should be implemented to support academic success and student motivation.
3. Social media can be leveraged to promote educational content and peer collaboration, enhancing academic achievement through structured use.
4. Interventions should focus on improving both academic achievement and personality traits to help students manage their social media usage effectively.

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