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EXAMINING THE IMPACT OF BIG FIVE PERSONALITY TRAITS AND LEARNING STYLES ON ACADEMIC ACHIEVEMENT: THE MEDIATION EFFECTS OF LEARNING STYLES IN POST SECONDARY EDUCATION

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ABSTRACT

EXAMINING THE IMPACT OF BIG FIVE PERSONALITY TRAITS AND LEARNING STYLES ON ACADEMIC ACHIEVEMENT: THE MEDIATION EFFECTS OF LEARNING STYLES IN POST SECONDARY EDUCATION

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The relationships between personality, learning styles, and their impact on academic achievement were explored. College students from St. John's University in Queens, NY (91 undergraduates) completed the International Personality Item Pool Representation of the NEO PI-R (IPIP-NEO), the Inventory of Learning Processes (ILP), and reported their grade point average (GPA). Two of the Big Five traits, conscientiousness and extraversion, were positively correlated with all four learning styles (synthesis analysis, methodical study, fact retention, and elaborative processing), whereas neuroticism was negatively related with all four learning styles. In addition, openness and agreeableness were positively correlated with synthesis-analysis. Conscientiousness was the only personality factor positively correlated with GPA. The Big Five together explained 9% of the variance in GPA, and learning styles explained an additional 7%, which suggests both personality and learning styles contribute to academic achievement. Additionally, the relationship between conscientiousness and GPA was suppressed by elaborative processing. These results suggest that being dutiful and hardworking diminishes academic performance when students combine this work ethic with relating information to their personal experiences. Implications of these results are discussed in the context of school psychology and curriculum design.

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Chapter I

Introduction

While there does exists a strong association between general cognitive ability and academic achievement, evidence suggests that 51% to 75% of the variance in academic achievement is unaccounted for by measures of general cognitive ability alone (Rhode & Thompson, 2007). As a result, researchers have begun to examine and assess for other factors that may account for such wide variability across achievement measures. The impact of personality on academic achievement has recently garnered significant attention, with many researchers examining the components of the five-factor model of personality as potential mediating factors to academic success. Evidence indicates that personality traits account for a modest amount of variability within cognitive ability, with researchers suggesting five to ten percent variability across individuals (Furnham et al., 2007). However, while the connection between personality and cognitive ability is modest, traits such as the Big Five personality factors (Costa & McCrae, 1992) account for significant portion of variance in academic achievement (Chamorro-Premuzic & Furnham, 2003). Learning behavior and learning styles have also been identified as having a significant impact on students' academic achievement. In fact, learning behavior has been found to be a more accurate predictor of teacher-assigned grades than measures of cognitive ability (Schaefer & McDermott, 1999). While the direct relationship between personality and academic achievement has been highlighted, more focus is needed to examine the influence of a student's unique learning style on academic success. This research aims to further examine the contribution of the relationship between the Big Five personality traits and academic achievement among a sample of St. John's

University students. Furthermore, the extent to which a student's unique learning style may mediate the relationship between personality and academic achievement will be examined.

Cognitive Ability and Academic Achievement

Several studies demonstrate that general cognitive ability (g) is a reliable predictor of academic achievement. Identifying specific components of general cognitive ability provides further insight into individual differences in performance across academic and achievement domains. The Cattell-Horn-Carol (CHC) model of human cognitive abilities conceptualizes these components within a hierarchical structure, with some abilities having a broader scope than other abilities. At the bottom of the hierarchy are directly observable specific abilities, which are directly measurable specific tasks. The abilities that are highly correlated with one another are clustered into narrow abilities. Broad abilities are those groupings of narrow abilities that are more correlated with each other than with abilities in other broad-ability clusters (Schneider & McGrew, 2018). Presently, CHC theory identifies eight broad areas: Fluid Reasoning (Gf), Comprehension-Knowledge (Gc), Short-Term Memory (Gsm), Visual Processing (Gv), Auditory Processing (Ga), Learning Efficiency (Gl), Retrieval Fluency (Gr), and Processing Speed (Gs). While previous assessment practices focused mainly on an individual's general ability or IQ score, Fiorello & Primerano (2005) discuss how contemporary psychoeducational assessment has shifted emphasis on analyzing the specific cognitive abilities that contribute to the overall IQ score, as they are considered to provide more information on an individual's true functioning in a given academic area. While such empirical evidence exists to support CHC theory and its use in diagnostic

evaluations and for guiding test selection, cognitive ability alone does not fully explain the variance in individual academic performance. While cognitive ability reflects the extent of which an individual is capable of doing, non-cognitive factors such as personality and learning styles informs what an individual will do (Furnham & Chamorro-Premuzic, 2004). As a result, Yen, Konold, & McDermott (2004) argue that assessing cognitive ability alone may prove to be ineffective in planning appropriately targeted intervention and treatment for learning problems. This evidence suggests that a greater emphasis should be placed on an individual's observable learning styles and personality traits in order to inform appropriate intervention and remediation of learning problems.

Big Five Personality Framework

The Big Five personality framework has developed to demonstrate a working relationship between personality traits and academic achievement (Poropat, 2009). These personality traits, otherwise referred to as the OCEAN model, operate as a suggested taxonomy of personality traits theorized by Costa & McCrae (1992). Openness to Experience features an intellectual curiosity about the world and a strong desire to explore novelties and new ideas. Conscientiousness is exemplified by high levels of competence, order, and a strong motivation to achieve. Extraversion is often displayed by high sociability, enthusiasm, and assertiveness. Agreeableness includes characteristics such as altruism, cooperation, and helpful towards others. Lastly, Neuroticism is refers to a degree of emotional stability, proneness to negative affect, and upset. A meta-analysis on the relation between academic achievement and the Big Five personality traits in postsecondary education conducted by O'Connor & Paunonen

(2007) reveals that there is a strong and consistent positive relationship between Conscientiousness and academic success. Furthermore, some evidence exists to suggest that academic performance is positively related to Openness to Experience but negatively associated with Extraversion. However, few strong relations were found between neither Agreeableness nor Neuroticism with high academic achievement. A recent study conducted in China by Wang et al. (2023) found that the overall effect of agreeableness on academic achievement was negative, suggesting that perhaps high levels of agreeableness may be a detriment to individual success despite it's benefit on team-work or group exercises.

Of note, the majority of the reviewed literature were drawn exclusively on the basis of zero order predictor-criterion correlation rather than multiple regression analyses, limiting the utility of its correlations. The present section will review the relations between personality and motivation to succeed academically as well as the impact of the interaction between personality factors and cognitive ability.

Academic Motivation

Personality has been found to be a strong predictor of motivation to succeed. In examining the impact of the Big Five personality traits on individual motivation, Komarraju et al. (2009) found that conscientious individuals significantly displayed higher intrinsic and extrinsic motivation, showed the lowest amotivation, and the highest achievement scores. Furthermore, those individuals who were more agreeable and neurotic also showed lower amotivation. A research study conducted by Clark & Schroth (2010) demonstrated similar findings. The researchers found that both intrinsically and extrinsically motivated college students were extraverted, agreeable, conscientious;

however, those students who were more extrinsically motivated were found to me more neurotic, whereas those who were more intrinsically motivated were found to be more open to new experiences. Moreover, academic motivation has been discovered to mediate the relationship between openness to experience and conscientiousness with academic performance (Hazrati-Viari et al., 2012).

Furthermore, personality has been found to be the most powerful predictor of attendance, essay marks, and behavior in college seminar-style classes (Furnham et al., 2003). Those post-secondary education students who are introverted and demonstrate more conscientious behavior are more likely to achieve and maintain success in their given program.

Personality as Predictor of Ability

The moderating effect of the direct interaction between personality factors and cognitive ability and their impact on educational status is also explored. Intelligence has been found to be most consistently predicted by high Openness to Experience and low Neuroticism, as well as by low Extraversion and low Conscientiousness (Moutafi et al., 2003). The negative relationship between cognitive ability and Conscientiousness appears contradictory at first look; however, the researchers believe that this relationship may in fact be compensatory. This intelligence compensation theory suggests that individuals with lower cognitive ability may develop higher levels of conscientiousness to offset disadvantages they may face in their work as a result of lack of ability.

Rammstedt et al., (2016) found that high levels of Openness to Experience served as a predictor of cognitive ability for those with low educational qualifications; however, for those who were highly educated, no such relationship was found. The researchers

believe that this suggests that an inquisitive and curious nature can positively influence the intellectual development of individuals who are subject to lesser stimulating environments. Alternatively, it may also imply that those individuals with higher cognitive ability become more open-minded after completion of their academic pursuits. Personality has been argued to be more important in predicting grades than scores from standardized achievement testing alone and is generally more predictive than IQ on a variety of important life outcomes, such as wage, physical and mental health, life satisfaction, and body mass index (BMI) (Borghans et al., 2016). Academic grades and achievement tests are found to be substantially better predictors of important life outcomes than IQ, as both capture personality traits that hold independent predictive power beyond that of just IQ alone (Borghans et al., 2016).

Learning Styles

The term learning style refers to the way in which an individual absorbs, interprets and organizes various information in a meaningful and effective way. Of course, an individual's learning style is unique and reflective of their own preferences and abilities to appropriately utilize incoming information. A focus on learning-style instruction proposes that individualized instruction catered to a students' unique learning style contributes to higher academic achievement.

Schmeck et al. (1977) describe four key learning processes subsumed under the information processing theory that are thought to be critical to student learning. Of the four individual learning styles, synthesis-analysis, later renamed deep processing (Schmeck, 1983) - refers to the depth of processing of information by utilizing categorization, organization, and discrimination. Elaborative processing refers to the

relation of information to one's own personal life and experiences, such as through the use of metaphors. Methodical study refers to those study techniques that are typically seen as conventional – strict adherence to methodological study and review of material. Lastly, fact retention is the preference to memorize individual facts and details. Taken as a whole, this information processing theory supports the notion that it is not the "intent to learn" that determines the successful encoding and retrieval of information, but the "quality" of a thought that leads to effective information processing (Schmeck & Geisler-Brenstein, 1989).

Learning Styles and Personality

Research has demonstrated a relationship between the Big Five personality traits and individual learning styles conceptualized by Schmeck (1977). Conscientiousness and Agreeableness have been shown to be positively related to all four learning styles; however, Neuroticism was found to have a negative relationship among all four learning style (Köseoglu, 2016; Komarraju et al., 2001). In addition, a higher level of both Openness and Conscientiousness in students was found to be related to a preference for deep and elaborative processing, whereas Extraversion and Openness have a positive relationship with elaborative processing (Marcela, 2015).

While students have their own preferred learning styles, these processes can be broadly categorized into either deep/reflective styles (synthesis-analysis and elaborative processing) or shallow/agentic styles (methodological study and fact retention). Deep processors also tend to be more Conscientious and Open to Experience in comparison to shallow processors (Zheng, 2003).

Learning Styles and Academic Achievement

A student's preferred learning style has been demonstrated to impact academic achievement. Deep processing, fact retention, and elaborative processing have previously been found to be significantly positively related to grade point average and scores on the American College Testing (ACT) Program Assessment (Schmeck & Grove, 1979), suggesting that high achieving students appear to process information in depth and encode information in reference teir own personal experiences and lives.

Chapter II

Current Study

Research has demonstrated a complex interaction between personality traits, learning styles, and academic achievement. Conscientiousness and Agreeableness has been positively linked with all four learning styles put forth by Schmeck (1977), while Extraversion and Openness have been linked to elaborative processing. Komarraju et al. (2011) demonstrated that the Big Five personality traits explained 14% of the variance in grade point average, with learning styles accounting for an additional 3% in a sample of 308 undergraduate students. Furthermore, the researchers found that *reflective* learning styles, deep and elaborative processing, mediated the relationship between Openness and grade point average. While this study suggests a unique dynamic between personality and learning styles on students' academic achievement, related literature is limited and therefore further research is needed to expand on the relationship between these variables.

The present study aims to replicate and expand upon the findings of Komarraju et al. (2011). To address this aim, I will conduct correlational, regression, and mediation analyses examining the impact of personality traits and learning styles on level of academic achievement by comparing responses to both cumulative grade point averages among an undergraduate student sample. This study will test the following hypotheses:

1. Individuals who score high on Openness demonstrate a strong desire to explore novelties and are fueled by their intellectual curiosity. As such, it expected that

openness will be positively related to reflective learning styles (synthesis-analysis and elaborative processing) as well as GPA.

2. Conscientious individuals are highly competent and are driven by a strong motivation to succeed. It is predicted that conscientiousness will be positively associated with both reflective (synthesis-analysis and elaborative processing) and agentic learning styles (methodological study and fact retention) as well as GPA.
3. Individuals who score high of Agreeableness demonstrate altruism and a high level of cooperation. As such, they may be more likely to complete assigned work and engage in beneficial peer-learning activities. Therefore, it is expected that Agreeableness will be positively associated with both reflective and agentic learning styles as well as GPA.
4. As noted by Komarraju et al. (2011), extraversion is likely to be context-specific and, as a result, it is difficult to make predictions of associated learning styles and GPA.
5. Due to high levels of anxiety, negative affect, and self-criticism, it is expected that high Neuroticism will be negatively associated with both reflective and agentic learning styles as well as GPA.
6. Given that conscientious individuals are intrinsically driven to achieve and the deeper access reflective learning styles account for, it is expected that the relationship between GPA and Conscientiousness is mediated by both elaborative processing and synthesis-analysis.

Chapter III

Methods

Participants

Participants were 91 undergraduate students from St. John's University in Queens, New York who completed the International Personality Item Pool Representation of the NEO PI-R (IPIP-NEO), the Inventory of Learning Processes (ILP), and reported their current GPA and college-housed major. GPA was obtained via St, John's University's Office of Institutional Research. Of the collected sample**,** 63 (69.2%) are studying in the College of Liberal Arts and Sciences, 8 (8.8%) are studying in the College of Pharmacy and Health Sciences, 8 (8.8%) are undeclared, 6 (6.6%) are studying in the College of Professional Studies, 5 (5.5%) are studying in the School of Education, and 1 (1.1%) are studying in the College of Business.

Procedure

The International Personality Item Pool Representation of the NEO PI-R (IPIP-NEO) consists of 120 items used to assess the Big Five personality traits. The IPIP-NEO was created in an effort to develop and continually refine a viable, public-domain personality measure (Goldberg, 1999). For each presented item, respondents selected their level of agreement or disagreement via a Likert scale (i.e., very inaccurate, moderately inaccurate, neither inaccurate nor accurate, moderately accurate, very accurate). In the present study, the Cronbach alpha values for each subscale's internal consistency (see Appendix A.1) are as follows: .93 (neuroticism), .91 (conscientiousness), .86 (extraversion), .83 (agreeableness), .69 (openness).

The Inventory of Learning Processes (Schmeck, Ribich, & Ramanaiah, 1977) consists of 62 items that assess reflective (synthesis-analysis and elaborative processing) and agentic (methodical study and fact retention) learning styles. For each presented item, respondents selected whether the statement applied to them or not by selected either "true" or "false". In the present study, the Cronbach alpha values for each learning style (see Appendix A.2) are as follows: .85 (methodical study), .72 (elaborative processing), .72 (synthesis-analysis), .62 (fact retention). Items measuring methodical study assessed study methods (i.e., "I cram for exams", "I have regular weekly review periods"). Items measuring elaborative processing looked at how material is related to other experiences (i.e., "new concepts usually make me think of other similar concepts"). Those items assessing for synthesis-analysis looked at the categorization and organization of material (i.e., "I find it difficult to handle questions requiring comparison of different concepts", "I have trouble organizing the information I remember"). Fact retention is the preference to memorize content (i.e., "I am very good at learning formulas, names, and dates"). The correlation between the two reflective learning styles was .75 and the correlation between the agentic learning styles was .85 (see Appendix A.3).

Chapter IV

Results

Correlational

Correlational analyses revealed a number of significant relationships (see Table 1). Neuroticism was negatively correlated with all four learning styles. Extraversion and Conscientiousness were both positively correlated with all four learning styles. Openness and Agreeableness were positively correlated with synthesis-analysis only. Conscientiousness was the only personality factor positively correlated with GPA. No single learning style was found to be significantly correlated with GPA; however, although not significant, it is interesting that elaborative processing was negatively correlated with GPA, while synthesis-analysis, methodical study, and fact retention were positively related with GPA.

Regression

Regression analyses were conducted to assess the extent Big Five personality traits predicted each of the four learning styles (see Table 2). The results indicate that neuroticism, openness and conscientiousness explained 43% of the variance in synthesis-analysis, $F(5,90) = 12.85$, $p < .001$; agreeableness and conscientiousness explained 18% of the variance in elaborative processing, $F(5,90) = 3.80$, $p < .004$; conscientiousness and extraversion explained 30% of the variance in methodical study, $F(5,90) = 7.06$, $p < .001$. Of note, no significant predictors for fact retention were revealed after analysis.

Next, two separate regression analyses were conducted to assess which of the Big Five personality traits and learning styles explained significant variation in GPA among the sample (see Table 3). The Big Five personality traits explained 9% of the variance in

GPA, with conscientiousness emerging as the only significant predictor, $F(5, 90) = 1.69$, $p < .001$. Learning styles explained 8% of the variance in GPA, with elaborative processing emerging as the only significant negative predictor, $F(4, 90) = 1.97$, $p < .001$.

Lastly, to examine whether learning styles had any more significant variance in GPA than the Big Five personality traits, a hierarchical regression analysis was conducted (see Table 4). In the first step, one of five Big Five personality traits that emerged as a significant predictor was entered. In the second step, one of the four learning styles that emerged as a significant predictor was entered. Personality traits explained 6% of the variance in GPA (with conscientiousness as the only significant predictor) and learning styles explained an additional 5% of the variance. Personality and learning styles together explained 11 percent of the variance in GPA, $F(2, 89) = 5.686$, $p = .005$.

Mediation

The extent to which learning styles mediated the relationship between GPA and personality among the sample. In order to conduct the mediation analyses, Hayes PROCESS v3.3 software was installed and added to SPSS.

The results of the mediation analyses showed that elaborative processing partially suppressed the relationship between conscientiousness and GPA. Specifically, when elaborative processing was included, the relationship between conscientiousness and GPA was increased from .25 to .34, $F(2,88) = 5.67$, $p < .005$. See Figure 1.

Post Hoc

Following the multiple regression analyses that were conducted with each of the Big Five traits regressed on each of the learning styles, additional regression analyses

were conducted to determine which specific facets under each Big Five trait were significantly related to each learning style. By conducting further analyses in this matter, unique aspects of the broader personality traits can be identified.

Neuroticism, openness, and conscientiousness explained 43% of the variance in synthesis-analysis. Further analysis shows that one conscientiousness facet of self-discipline was found to be positively related to the learning style ($t = 2.294$, $p < .05$). The openness facets imagination and liberalism were found to have negative relationship with synthesis analysis ($t = -3.638$, $p < .001$; $t = -2.001$, $p < .05$). Three other openness facets, emotionality, adventurousness, and intellect were found to be positively related to the learning style ($t = 2.542$, $p < .05$; $t = 2.260$, $p < .05$; $t = 3.589$, $p < .001$, respectively). No individual neuroticism facet was found to have a significant relationship with synthesis-analysis.

Agreeableness and conscientiousness explained 18% of the variance in elaborative processing. One conscientiousness facet of dutifulness was found to be positively related to elaborative processing ($t = 2.181$, $p < .05$). Conversely, the conscientiousness facet of cautiousness was found to have a negative relationship ($t = -2.582$, $p < .05$). The agreeableness facet of modesty was found to have a negative relationship with elaborative processing ($t = -2.023$, $p < .05$).

Conscientiousness and extraversion explained 30% of the variance in methodical study. The conscientiousness facet of self-discipline was positively related to methodical study ($t = 2.042$, $p < .05$). Conversely, the conscientiousness facet of cautiousness was found to have a negative relationship ($t = -2.815$, $p < .05$). The extraversion facets of

activity level and cheerfulness were both positively related to methodical study ($t = 3.955$, $p < .001$; $t = 3.049$, $p < 01$, respectively).

Chapter V

Discussion

After a thorough review of all analyses, previously made hypotheses were addressed. It was predicted that individuals who score high on openness would demonstrate a positive relationship with both reflective learning styles and GPA. Although it was found that openness was only *significantly* positively associated with synthesis analysis, openness was also positively correlated with elaborative processing. It was found that agreeableness was also only *significantly* positively associated with synthesis analysis and was negatively correlated with elaborative processing. Interestingly, although extroversion was not found to be significantly related to GPA, it was found to have a significant positive relationship with all four learning styles. The hypothesis that conscientious individuals will be positively associated with both reflective and agentic learning styles along with GPA was accurate in its assumption. Neuroticism was found to be significantly negatively associated with all four learning styles and have a negative relationship with GPA.

The results of this present study demonstrate number of different relationships between the big 5 personality traits learning styles and academic achievement among a sample of undergraduate students in Queens, NY. These findings contribute to the existing literature on the unique interactions between personality and in individuals learning style and moreover provide additional insight on their combined effects on individual academic achievement.

First, it is important to examine the effect unique personality traits have on individual students. The results of this study indicate that both conscientiousness and

extraversion were positively correlated with all four learning styles. This positive correlation with all four learning styles suggests that these two personality traits play a significant role in helping to facilitate a variety of different learning strategies. Additionally, it was found that conscientiousness was positively associated with GPA. This suggests that students who have a tendency to be hard working, goal oriented, and organized are likely to succeed academically. The results also revealed that neuroticism was negatively correlated with all four learning styles.

Second, synthesis-analysis, methodological study, and fact retention were positively correlated with GPA, suggesting that these learning styles have an impact on achievement within post-secondary education. Inexplicably, elaborative processing was found to be negatively correlated with GPA among this sample. This finding is in contrast to previously published findings that found elaborative processing to be positively correlated with GPA (Komarraju et al, 2011). Additionally, further information from the regression analysis revealed that elaborative processing was the only learning style that explained significant variation in GPA beyond the Big Five personality traits, and that the learning style mediated the relationship between conscientiousness and GPA. An item-level analysis of all items that comprise the scale revealed discrepancy among participants' endorsements, with high number of negative endorsements. These endorsements suggest that this sample of students does not often relate class instruction their own personal experiences.

Third, in looking at the relationship between personality and learning styles, conscientiousness predicted all three learning styles that were positively correlated with GPA. This finding suggests that students who are responsible, organized, hardworking,

and goal directed are likely to utilize different approaches to support their learning. Openness predicted synthesis-analysis, which suggests that students with higher degrees of intellectual curiosity will engage in a more reflective learning process. Interestingly, those students who are more agreeable were less likely to utilize elaborative processing as a learning style. Those students who had endorsed high levels of modesty were less likely to relate course material to their own lives. Extraversion predicted methodological study. Those students who had indicated a high activity level and intrinsic drive were more likely to utilize a methodological approach to studying. Conversely, neuroticism was negatively related to synthesis analysis. This finding suggests that students who have a tendency to anger quickly have difficulty with the categorization, organization, and discrimination of material.

Previous literature has demonstrated a positive relationship between elaborative processing and academic achievement (Komarraju et al., 2011). The results of this present study shows a negative relationship between the learning style and GPA among this sample of students at St. John's university. There are several factors that should be considered in the interpretation of this negative relationship. Most notably, the sample was selected from undergraduate students from St. John's University in Queens, NY, in urban population with varying ethnic and socioeconomic status backgrounds. The study conducted by Komarraju et al. (2011) utilized a sample from Southern Illinois University, which is within a suburban setting. An analysis of the demographics between both universities revealed insight on student population. Southern Illinois University latest enrollment report shows a breakdown of the student population as 67.3% white, 13.9% African American, and 9.6% Hispanic. This is in contrast to St. John's University's most

recent enrollment report that shows 47.7% white, 14.5% Hispanic, 13.6% Asian, and 11.1% African American. Further research in this area could account for demographic differences between geographic populations and socioeconomic status. Additionally, the data from this study was collected and the fall of 2021, with the impact of COVID-19 still actively impacting the academic lives of students. The impact that COVID-19 had on students personal lives and experiences and ability to access the curriculum should be considered in the interpretation of the present study's data.

Although this study reveals insight on the implications of personality and learning styles on academic achievement, it is important to note it's limitations. Most notably, the present study lacked specific demographic information, such as sex and ethnic identity. Obtaining this additional information would provide further insight on the impacts of demographics on academic success and learning behavior. Additional information regarding a student's learning style could be obtained from various raters amongst various academic departments to increase validity. Although the current study obtained consenting students GPAs from St. John's University's Office of Institutional Research, further studies should obtain major specific GPA in addition to overall GPA. As noted by Chen (2013), the more a student identifies with their declared major, the more willing they are to work hard and succeed academically. Obtaining major specific GPA will provide further information on the mediation effect of major identity on self-efficacy. Additionally, future research could benefit from additional reports such as attendance records, time for degree completion, and family education.

Chapter VI

Implications of the Results for Practice

The results of this present study aim to contribute to the existing literature on the relationships between personality, learning styles, and academic achievement, as well to provide insight on how a student's individual learning style mediates the relationship between achievement and their personality traits. This information is useful for school psychologists in their practice and should be used to inform the way content is delivered to students. Furthermore, these findings suggest that the addition of a personality assessment measure, like the NEO PI-R, should be implemented to obtain insight as to how an individual student learns.

The results of the present study revealed a positive relationship between the Big Five personality traits of conscientiousness and extraversion with all four learning styles. Therefore, it would likely prove beneficial for instruction to be tailored to aid in the facilitation of socialization, perhaps through peer instruction or group work activities. Furthermore, executive functioning skills can be developed to support students' intrinsic desire to succeed. Conversely, neuroticism was found to be negatively correlated with all four learning styles. School faculty should be conscious of the negative impact that a tendency towards negative affect such as anxiety and depression have on a student's ability to access the curriculum to their full potential. Given the unique relationships between personality traits and learning styles, a curriculum designed to teach and strengthen soft skills such as interpersonal skills, time management, problem solving, and critical thinking would likely prove beneficial for all students.

The information gathered from this study and those that have preceded it should be used in consideration in the differentiation of student classwork as well as modifications to the learning environment.

Appendix A

Table 1.

Correlations between the Big Five personality traits, learning styles and GPA.

Big Five Personality Factors	*Elaborative Processing*	*Synthesis-Analysis*	*Methodical Study*	*Fact Retention*	*GPA*
Neuroticism	-.25*	-.57**	-.37**	-.43**	-.07
Extraversion	.30**	.40**	.46**	.34**	.06
Openness	.13	.22*	.01	-.07	-.09
Agreeableness	-.04	.21*	.09	.10	.14
Conscientiousness	.29**	.52**	.45**	.41**	.25*
GPA	-.15	.17	.07	.02	

Note.
*p < .05
**p <.01

Table 2.

Multiple regression analyses with the Big Five traits regressed on each of the learning styles.

Factor	Predictor	Beta	R^2	Adjusted R^2	*Partial Correlations*
Synthesis Analysis	*Neuroticism*	-.38**			-.31
	Openness	.28**			.32
	Conscientiousness	.30*			.25
			.43	.40	
Elaborative Processing	*Conscientiousness*	.35*			.24
	Agreeableness	-.26*			-.23
			.18	.14	
Methodical Study	*Conscientiousness*	.40**			.31
	Extraversion	.34**			.46
			.29	.25	

Note.
*p < .05
**P < .01
***p <.001

Table 3.

Two separate multiple regression analyses with the Big Five traits regressed on GPA and the four learning styles regressed on GPA.

Factor	Predictor	Beta	R^2	Adjusted R^2	Partial Correlations
GPA	*Neuroticism*	.20			.13
	Extraversion	.03			.02
	Openness	-.11			-.11
	Agreeableness	.05			.05
	Conscientiousness	.35*			.23
			.09	.04	
GPA	*Synthesis Analysis*	.18			.16
	Elaborative-Processing	-.28*			-.15
	Fact Retention	-.04			-.04
	Methodical Study	.18			.15
			.08	.04	

Note.

*p < .05

**p < .01

Table 4.

Hierarchical multiple regression analyses with the significant Big Five personality traits and four learning styles regressed on GPA.

Factor		Predictor	Beta	R^2	Adjusted R^2
GPA	*Step 1*	*Conscientiousness*	.32**		
				.06	.05
	Step 2	*Elaborative-Processing*	-.24*		
				.11	.09

Note.

*p < .05

Table 5.

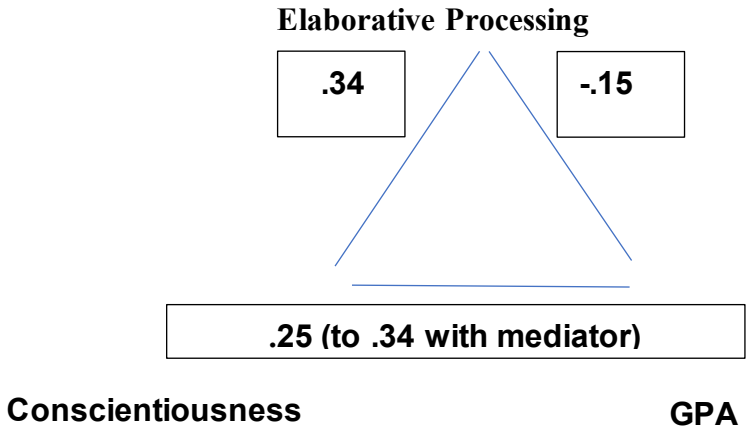
Post Hoc analyses with the Big Five facets regressed on each of the learning styles.

Factor	Predictor	Beta	R^2	Adjusted R^2
Synthesis Analysis	*O1: Imagination*	-.32***		
	O3: Emotionality	.24*		
	O4: Adventurousness	.23*		
	O5: Intellect	.36***		
	O6: Liberalism	-.19*		
	C5: Self-Discipline	.35*		
			.44	.40
Elaborative Processing	*C3: Dutifulness*	.29*		
	C6: Cautiousness	-.33*		
	A5: Modesty	-.23*		
			.33	.29
Methodical Study	*C5: Self-Discipline*	.31*		
	C6: Cautiousness	-.26*		
	E4: Activity Level	.40***		
	E6: Cheerfulness	.37**		
			.45	.36

Note.
*p < .05
**P < .01
***p <.001

Figure 1.

Conscientiousness and GPA partially suppressed by elaborative processing.



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