

THE INFLUENCE OF PERSONALITIES ON COGNITION IN AFRICAN
AMERICAN ADULTS

by

Aleiah N. Mann, B.S.

A thesis submitted to the Graduate Council of
Texas State University in partial fulfillment
of the requirements for the degree of
Master of Science
with a Major in Dementia and Aging Studies
August 2022

Committee Members:

Kyong H. Chee, Chair

Valarie B. Fleming

Xi Pan

COPYRIGHT

by

Aleiah N. Mann

2022

FAIR USE AND AUTHOR'S PERMISSION STATEMENT

Fair Use

This work is protected by the Copyright Laws of the United States (Public Law 94-553, section 107). Consistent with fair use as defined in the Copyright Laws, brief quotations from this material are allowed with proper acknowledgement. Use of this material for financial gain without the author's express written permission is not allowed.

Duplication Permission

As the copyright holder of this work I, Aleiah N. Mann, authorize duplication of this work, in whole or in part, for educational or scholarly purposes only.

ACKNOWLEDGEMENTS

My sincerest gratitude is primarily to Dr. Kyong H. Chee for taking me under her wing, providing me exceptional guidance and knowledge, and serving as such a wonderful thesis chair. I also want to give my thanks to Dr. Xi Pan and Dr. Valarie Fleming for serving as my committee members and exhibiting immense patience and extraordinary guidance and support throughout the development of this thesis. To Dr. Chee, Dr. Pan, and Dr. Fleming, I am forever grateful.

To my wonderful mother, father, and sister, thank you for the unwavering support throughout my graduate journey. You all are the reason I have gotten this far, and I cannot say thank you enough for your encouragement and support all the way.

To God, my Lord and Savior, thank you for ordering my steps and enabling me to withstand trials and tribulations. Additionally, for always leading me to overcoming and eventual success. Lord, I thank you for all you have done, and I pray for your continued love and guidance.

TABLE OF CONTENTS

	Page
ACKNOWLEDGEMENTS	iv
LIST OF TABLES	vi
LIST OF FIGURES	vii
LIST OF ABBREVIATIONS	viii
ABSTRACT	ix
CHAPTER	
I. INTRODUCTION.....	1
Background and Context	1
II. LITERATURE REVIEW	6
Theoretical Framework	5
Empirical Literature	11
III. RESEARCH DESIGN AND METHODOLOGY	29
IV. RESULTS	37
V. DISCUSSION	47
VI. LIMITATIONS	56
VII. CONCLUSION	58
APPENDIX SECTION.....	59
REFERENCES	62

LIST OF TABLES

Table	Page
1. Personality Descriptions	31
2. Cognitive Test Descriptions.....	32
3. Cognitive Descriptive Statistics	35
4. Sociodemographic Control Descriptions	36
5. Sociodemographic Controls Correlational Matrix.....	38
6. Correlation Matrix without Control Variables.....	39
7. Correlation Matrix with Control Variables.....	42
8. Openness ANOVA.....	43
9. Agreeableness ANOVA.....	44

LIST OF FIGURES

Table	Page
1. Agreeableness and Executive Function Scatterplot.....	40
2. Openness and Episodic Memory Scatterplot	41
3. Openness and Executive Function Scatterplot.....	41

LIST OF ABBREVIATIONS

Abbreviation	Description
MIDUS	Midlife in the United States National Longitudinal Study
ANOVA	Analysis of Variance
ANCOVA	Analysis of Covariance

ABSTRACT

The five-factor personalities, openness, conscientiousness, extraversion, agreeableness, and neuroticism were examined to find if these personalities have an influence on cognition in African Americans. The quantitative analyses of descriptive statistics, frequencies, correlations, Analysis of Variance (ANOVA), and Analysis of Covariance (ANCOVA) were conducted on a subsample of 94 African American adults (mean age of 61 years) from the Midlife in the United States (MIDUS) data. Of the five personalities, openness and agreeableness had significant influence on episodic memory and executive function. These findings suggest that some personalities do influence domains of cognition. Further research of the relationship between personality and cognition is necessary in larger African American samples to explore and understand these relationships.

Keywords: African Americans, five-factor personalities, cognition

I. INTRODUCTION

Background and Context

The purpose of this thesis is to analyze the relationship between personality and cognition. Then, explore how this relationship may be affected by sociodemographic inequalities/inequities in an African American population. There is literature that reports findings of cultural differences in personality traits. African American culture, as much as it deals with success, resilience, and joy, is also impacted by socioeconomic disparities and inequities present in the United States today and historically. To this point, personality factors may be associated with specific socioeconomic factors. Research suggests that the influence of personality traits is important in life outcomes in domains such as mortality, divorce, occupational attainment, socioeconomic status, and cognitive ability (Roberts, Kuncel, Shiner, Caspi & Goldberg, 2007). The authors suggest that due to their findings, research on personalities' influence in diverse populations is critical.

The theory of cumulative inequality is a systematic explanation of how inequalities develop in socioeconomic factors, health, and overall wellbeing (Merton, 1988). Research suggests that personality in some cases can enhance or detract from risks resulting from socioeconomic status and considering personality through the lens of cumulative inequality is informative because both could be systematically impacted (Chapman, Fiscella, Duberstein, Coletta & Kawachi, 2009). An applicable example of this idea of enhancement or detracting is the finding reported in the literature that, for example, those who are highly open tend to partake in more highly cognitively stimulating activities: if someone is more open, this may enhance their socioeconomic outcomes over the life course because they may be more highly motivated to obtain

higher education, get a cognitively stimulating job, and partake in various activities (Chapman et al., 2009). Comparatively, someone who is for example, highly neurotic, this may detract from their socioeconomic outcomes over the life course because they are inherently stressed and have a higher prevalence of depression and anxiety, which may, in turn, influence their desire strive for higher status (Chapman et al., 2009). Through the lens of cumulative inequality, there lie explanations about health disparities in minorities (Wallace, 2012). Cumulative inequality affects not only one person, but cohorts and entire groups of people. The accumulation of inequality within marginalized groups may have detrimental long-term effects. African Americans have historically endured many disadvantages from societal structure, discrimination, and oppression. Social factors such as unemployment, living in impoverished areas, lack of education, discrimination, and racism all play a part in the inequalities African Americans experience. These factors have been present for centuries, putting African Americans in a position where, as a group, they have suffered accumulated disadvantage. This disadvantage not only has socioeconomic impact, but disproportionate health effects as well. For example, studies show that Alzheimer's disease is more prevalent in African Americans as compared to white Americans (CentraState Healthcare System, 2020).

A paper by Clark, Anderson, and Williams (1999) lays fundamental groundwork for understanding how racism is a stressor in African Americans and presents several topics for future research. The overall finding in this article is that the perception of racism usually results in psychological and physiological stress responses (Clark et al., 1999). The authors provided support for this statement by exhibiting evidence of intergroup and intragroup racism. This racism in turn, influences African American

wellbeing (Clark et al., 1999). Environmental stimuli as described in this paper are constitutional factors (ex, skin tone), sociodemographic factors (SES), psychological, and behavioral factors. These factors relate to perception of racism and stressors, how one may respond to it, and eventual health outcomes. Environmental stimuli such as sociodemographic factors (i.e., socioeconomic status) present an effect because socioeconomic status of African Americans as compared to white Americans is significantly lower (Crews, Pfaff & Powe 2013). This contributes to possessing additional stressors. Consequently, having low socioeconomic status forces individuals with less resources to deal with stress (Clark et al., 1999). Repeated exposures to multiple mediums of stress can lead to depression, heart disease, arterial blood pressure changes, and pulmonary diseases (Clark et al., 1999). Detriments in vascular health have been found to lead to greater risk of neurodegenerative diseases, like dementia. Cardiovascular risk in middle-aged adults were related to more reduced perfusion in the grey matter in older age (Sierra, 2020). Hypertension has been associated with an increased risk for cognitive decline and dementia, specifically vascular dementia, and Alzheimer's disease (two common dementias found in African Americans) (Turner, James, Capuano, Aggarwal & Barnes, 2017). These studies are crucial to understanding why this topic is extremely important. Stress in African Americans may be leading to detrimental health effects in many cardiovascular issues, which are strongly associated with cognitive decline and specific dementias.

Stressful life events are associated with cognitive decline and the effects of stressful life events on cognition in older adults vary based on age and education (Harada, Natelson & Triebel, 2013). The effect of stressful life events has been found to be greater

within those with fewer years of education (Harada et al., 2013). Cumulative inequality theory indicates that *disadvantage increases exposure to risk*. Particular groups are not afforded resources due to cumulative inequality, which over time may increase the risk of certain cognitive deficits. Although modern progressive movements are attempting to bridge the gap between educational access amongst minorities, African Americans are still at a disadvantage in educational attainment based on area of residence, socioeconomic status, and access to tools to help them thrive in school. This is once again a by-product of cumulative inequality. Regardless, older African Americans still suffer from the repercussions of these still very present disparities in education. A study analyzing 407 older African American adults indicated that a higher level of perceived discrimination was related to worse performance on cognitive tests, specifically episodic memory measures (Turner, James, Capuano, Aggarwal & Barnes, 2017). Episodic memory deficits are a common consequence of Alzheimer's disease, and Alzheimer's disease is more prevalent in African Americans as compared to white Americans (Zhou, Elashoff & Teng, 2017).

A study assessing 46 African Americans used nineteen different cognitive tests and Cohen's Perceived Stress Scale findings suggest that there were higher levels of perceived stress in African Americans that indicated more rapid decline in global condition (Turner et al., 2017). The notable areas of global cognition in this sample were episodic memory and visuospatial ability (Turner et al., 2017). An astounding statistic included in the discussion section reported that in a population-based study, higher levels of perceived stress were related to lower cognitive scores at baseline, and the decline accelerated faster in African Americans, as compared to other groups in the study (Turner

et al., 2017).

The purpose of this thesis will be to identify a relationship among personality and cognition in an African American population. More specifically, this thesis will attempt to find a relationship between personality and cognition while controlling for specific sociodemographic characteristics. The question this thesis will explore is if there is a significant relationship between personality traits (i.e., openness, conscientiousness, extraversion, agreeableness, and neuroticism) and cognitive performance in African Americans. This thesis hypothesizes that personality factors are associated with cognition in African Americans adults while controlling for sociodemographic factors. This area is important for two reasons. First, it is to emphasize the importance of the study of African American personality and also, to advocate for the expansion and deeper understanding of personality in African Americans and its impact on socioeconomic and health outcomes. Secondly, it is to understand how personality factors affect cognitive factors.

II. LITERATURE REVIEW

Theoretical Framework

The main theoretical framework being used in this thesis is the five-factor theory of personality. The five-factor theory of personality was developed in 1949 by D. W. Fiske in 1942 and was expanded upon by various other researchers from the late 60s to the late 80s (McCrae & Costa, 2008). The five personality traits consist of openness, conscientiousness, extraversion, agreeableness, and neuroticism. This theory was initially developed and analyzed to understand behavior (McCrae & Costa, 2008). As the theory and research continued to develop, certain characteristics were found to be associated with each personality trait. Cumulative inequality theory (Merton, 1988; Ferraro, Shippee & Schafer, 2008) also helped frame this study.

Five-Factor Theory of Personality

The five-factor theory of personality was developed as an empirical generalization about the covariation of personality traits (McCrae & Costa, 2008). The theory uses some tenants of trait theory, stating that individuals can be characterized by thoughts, feelings, and actions, and that these traits can be quantitatively assessed (McCrae & Costa, 2008). The core components of personality are basic tendencies, characteristic adaptations, and the self-concept (McCrae & Costa, 2008). According to McCrae and Costa, personality starts with external influences such as cultural norms and life events, which then impact the biological bases of personality. The biological bases produce the basic tendencies of personality, which are thought to be openness, conscientiousness, extraversion, agreeableness, and neuroticism. From there, complex, and intricate processes then create and shape personality.

The five-factor theory of personality is an important development in psychology and personality research because it offers explanation for personality by conceptualizing traits on a scale versus describing a persons' personality in a binary manner (McCrae & Costa, 2008). These traits being described on a spectrum allows individuals to be more comprehensibly understood and accurately described. The five-factor theory of personality is the most widely accepted personality theory used to assess personality today (McCrae & Costa, 2008). The five basic tendencies in this model are universally referred to as the acronym OCEAN: openness, conscientiousness, extraversion, agreeableness, and neuroticism.

Openness

Openness refers to the tendency to be creative, curious, sensitive to aesthetics, and open to new ideas and experiences (Costa & McCrae, 1992). Those with greater openness to ponder ideas further, think creatively, and actively pursue cognitively stimulating experiences (Sharp, Reynolds, Pedersen & Gatz, 2010). Individuals with high openness are more likely to engage in stimulating activities, and openness may positively affect cognitive ability (Chapman et al., 2012). Research describes people with high openness showing traits of curiosity, creativity, and imagination (John & Srivastava, 1999). Those with low openness scores tend to show traits of unpredictability and lack of routine (John & Srivastava, 1999).

Conscientiousness

Conscientiousness refers to the tendency to be persistent, organized, and goal-directed, and to show self-control and self-discipline (Costa & McCrae, 1992). Traits of high and low conscientiousness are as follows: individuals with high conscientiousness

exhibit traits of high competence, organization, dutifulness, achievement striving, and self-discipline (Costa & McCrae, 1992). Those with low conscientiousness exhibit impulsiveness, incompetence, disorganization, and lack of discipline (Costa & McCrae, 1992). There may be a relationship between conscientiousness and cognitive ability such that conscientiousness is positively associated with cognitive functioning because conscientiousness influences health behaviors that are protective against age-related changes in the brain (Sutin, Terracciano, Kitner-Triolo, Uda, Schlessinger & Zonderman, 2011).

Extraversion

Extraversion refers to the tendency to be assertive and social, to experience positive affect, and to seek excitement (Costa & McCrae, 1992). Extraversion also reflects the level of comfort and assertiveness individuals have with others in social situations (Ackerman, 2017). Traits of high and low extraversion are as follows: those who are high in extraversion tend to be sociable, outgoing, and attention seeking (Clark, Anderson & Williams, 1999). Those who are low in extraversion prefer solitude, are reflective, and reserved (Clark, Anderson & Williams, 1999). Individuals who are high in extraversion may have a higher speed of response, higher assertiveness, and lower arousal and due to these factors, extraversion may provide advantages by lowering distraction during cognitive testing (Chapman et al., 2012).

Agreeableness

Agreeableness refers to the tendency to be altruistic, trusting, modest, and compliant (Costa & McCrae, 1992). Agreeableness is how people treat relationships and others, specifically on people's orientation and interactions with others (Ackerman,

2017). Traits of high and low agreeableness as follows (Clark, Anderson & Williams, 1999). Those with high agreeableness tend to be forgiving, straightforward, compliant, modest, and empathetic (Clark, Anderson & Williams, 1999). Individuals with low agreeableness tend to be more skeptical, demanding, stubborn, and unsympathetic (Clark, Anderson & Williams, 1999). Evidence suggests that agreeableness is not reliably associated with general cognitive ability, memory, or executive functioning in older adults, but it may have some association with processing speed and reasoning skills (Chapman et al., 2012).

Neuroticism

Neuroticism refers to the tendency to be emotionally unstable, and to experience negative emotions such as anger, anxiety, and depression (Costa & McCrae, 1992). Additionally, neuroticism considers how likely a person is to interpret events as threatening or difficult. Traits of high and low neuroticism are as follows (Clark, Anderson & Williams, 1999). Individuals who have high neuroticism are described as anxious, angry, hostile, and they tend to experience high levels of stress (Clark, Anderson & Williams, 1999). Individuals with low neuroticism are described as calm, resilient, and emotionally stable (Clark et al., 1999). According to research, individuals high in neuroticism may perform poorly on cognitive tasks because they are distracted by worry related thoughts or because their nervous system is easily aroused by stress (Gold & Arbuckle, 1990). It has also been suggested that neuroticism is more greatly associated with cognitive decline because the prolonged arousal those with high neuroticism tend to experience may cause neuronal damage over time (Sharp, Reynolds, Pedersen & Gatz, 2010). This prolonged arousal is a result of people with high neuroticism experiencing

greater stress or being overall more stressed in comparison to others (Sharp, 2010).

Cumulative Inequality Theory

The theory of cumulative inequality was initially developed in 1988 by Robert Merton and this theory has five axioms (Merton, 1988, pp. 609-611). Social systems generate inequality, which is manifested over the life course through demographic and developmental processes (Merton, 1988). Ferraro, Shippee and Schafer (2008) go further in explaining cumulative inequality theory in part with describing the Matthew effect. The Matthew effect states that accumulating benefits for those who are already advantaged often result in accumulated loss for those who are already disadvantaged (Ferraro et al., 2008). These authors also pose very important questions relative to the theory, asking if early disadvantages can be overcome and what mechanisms can counter the principles of the theory (Ferraro et al., 2008). These are extremely valuable questions to explore because with the knowledge of this theory prompts a call to action in how to disrupt it to make for a more equal and equitable society.

Inequality as a social construct is not an inevitable evil in society. Social structures shape human behavior and relations, and as a byproduct of these social forces, inequalities can be formed amongst groups. Disadvantage increases exposure to risk, but advantage increases exposure to opportunity (Merton, 1988). Social structures form an uneven playing field where some groups' position in society allows them to have access to resources that promote their success, while others do not have those same luxuries and are forced to try and excel when they are already disadvantaged. Life course trajectories are shaped by the accumulation of risk, available resources, and human agency (Merton, 1988). The perception of life trajectories influences subsequent trajectories (Merton,

1988). Life trajectory is affected by social structures as well their own perception of their life trajectory. Cumulative inequality may lead to premature mortality. Therefore, non-random selection may give the appearance of decreasing inequality in later life (Merton, 1988). Cumulative inequality provides support for why accumulation of inequality within marginalized groups may have detrimental long-term effects.

Empirical Literature

Background on Personality in African Americans

In a paper on Afrocentric theory of Black personality, Baldwin lays a great foundation for understanding black personality and explains why it is unique. Baldwin (1981) says that there are certain principles relating to black personality. Black personality is African in its basic nature, meaning it relates back to race and culture (Baldwin, 1981). Exposure to European culture and various psychological forces of oppression rooted in hate for the race has impacted black personality (Baldwin, 1981). Lastly, in mixed individuals where culturally normed “black features” are present, Africanism dominates the personality. Baldwin further elaborates on black people, the black experience, and how his framework is to lay a foundation for further research that can better explain black psychology (Baldwin, 1981). Black psychology is unique because: 1) black personality is deep rooted in black culture which has positives such as determination and resilience, but also 2) must consider oppressive forces and discrimination that may have an impact (Baldwin, 1981). The work of Joseph Baldwin as a framework to emphasize the concept of black personality and how black personality should be considered in psychological intervention in African American clients (Azibo & Allen, 1983). The article stresses that black personality is something that is based on

psychological experiences and biogenetics, and how the black experience must be considered when providing psychological intervention in African Americans (Azibo & Allen, 1983).

In black Afrocentric models of black personality, traditional African philosophical-cultural values, beliefs, and behavioral norms are assessed when analyzing personality. These models have three areas of emphasis: 1) an emphasis on traditional African culture in relation to cultural values, beliefs, and behavioral practices, that ultimately forms the core of African American personality, 2) structure, organization, and dynamics with society and the and lastly, 3) an emphasis on psychosocial nature, based heavily on interactions between African American culture and European culture. These points are very important in further understanding the derivation of black personality, its importance, and its implications.

Studies on black personality are important for understanding black psychology and the black experience in its uniqueness. The purpose, for the context of this thesis, is to understand how the concept of black personality may play a role in cognitive issues that affect African Americans. The aim of this section is to establish that black personality is categorical and deserves to be intricately assessed for a better and holistic understanding.

Personality and Cognition

Curtis, Windsor, and Soubelet (2015) performed a meta-analysis on associations between personality and cognition variables, outlining a vast amount of literature and its findings in relation to these variables. It has been hypothesized that individuals with high openness are more likely to engage in stimulating activities due to their predisposition to

think creatively and think over ideas (Curtis et al., 2015). Because of this predisposition, openness may positively affect cognitive ability, maintain cognitive function, and result in these individuals having a higher cognitive reserve (Curtis et al., 2015). As a positive consequence of the stimulating cognitive activities, openness tended to be positively related to older adults' cognitive ability.

Conscientiousness deals with self-control and self-discipline, as a result, it has been hypothesized that conscientiousness may positively influence cognitive function because that self-discipline may result in better health behaviors that act as protective factors against cognitive decline (Curtis et al., 2015). For example, conscientiousness has been found to be positively related to exercise, which is related to better cardiovascular health and cognitive health (Curtis et al., 2015). Research has also presented results relating conscientiousness to poorer cognitive health, such that those who have lower cognitive abilities overcompensate by being more organized and hardworking (Curtis et al., 2015).

Highly extraverted individuals tend to have a high speed of response and high assertiveness which may give them a positive advantage in cognitive testing (Curtis et al., 2015). Extraversion was shown to be positively associated with long term memory, but not executive function, processing speed, or auditory processing (Curtis et al., 2015). There is also a contrary hypothesis about extraversion and cognition that high extraversion could impair cognitive test performance because cognitive tests can be easily distracting and discomforting because they may have a lower tolerance for repetition (Curtis et al., 2015). Agreeableness, another of the five-factor personalities, did not show any significant relationships to cognitive abilities in older adults.

Individuals who exhibit high traits of neuroticism tend to be emotionally unstable, and exhibit anger, anxiety, and depression (Curtis et al., 2015). The literature has shown connections between neuroticism and cognition, such that since those with high neuroticism experience severe anxiety, and that anxiety can impair testing performance on cognitive testing (Curtis et al., 2015). It has been hypothesized that those with high neuroticism may suffer from stress and worry-related thoughts and that may cause distraction and poor performance on a cognition test (Curtis et al., 2015). There is also evidence that neuroticism is negatively related to cognitive ability because prolonged stress, anxiety, and arousal can cause neuronal damage over time (Curtis et al., 2015). These results provide an idea of how much personality may influence cognition and proves that further research in this topic is crucial to a better understanding (Curtis et al., 2015).

An additional study found that people with higher levels of openness tend to have higher levels of cognitive functioning in comparison to those with lower levels (Soubelet & Salthouse, 2010). Older adults were assessed in communal living and the effect of personality traits were examined on multiple cognitive domains, finding evidence that openness had a significant relationship with verbal memory and general cognitive ability. This may be due to lifelong patterns in education or hobbies according to Booth, Schinka, Brown et al. (2006). Both neuroticism and extraversion were found to not contribute to cognitive performance in any of their measures (Booth, Schinka, Brown, Mortimer & Borenstein, 2006). Although this study only found one personality trait, openness, to be a significant predictor of a cognitive domain, it still indicates that there is something to learn from personality as it relates to cognition. Furthermore, there is evidence that

openness had a moderate association with engagement in reading and writing activities (Soubelet & Salthouse, 2010). These results may indicate that openness could act as a protective factor against cognitive decline, due to the traits' high level of engagement in intellectually stimulating activities (Soubelet & Salthouse, 2010).

Literature also suggests that personality traits are related to self-assessed health and other types of health relevant cognition (Williams, O'Brien & Colder, 2004). Extraversion has been found to positively relate to health behavior, health behavior outcome expectancies, and estimates for positive health outcomes (Williams et al., 2004). This may be due to extraverted individuals usually being more "upbeat" and "optimistic," and this may a more positive view on certain health and cognitive conditions (Williams et al., 2004). Additionally, there was a curvilinear effect of extraversion on self-assessed health, such that extraversion was related to poorer global health ratings (Williams et al., 2004).

Research has been conducted to assess if there is a relationship between conscientiousness and the development of Alzheimer's disease. High conscientiousness scores were associated with an 89% reduction risk in Alzheimer's disease (Wilson, Schneider, Arnold, Bienias, & Bennett, 2007). Further, there were significant associations between conscientiousness and decreased incidence of mild cognitive impairment and reduced cognitive decline (Wilson et al., 2007). This evidence indicates that levels of conscientiousness may be a risk factor for development of Alzheimer's disease, thus should be further studied to understand the mechanisms causing this development. Agreeableness is another of the Big 5 personality traits that may have an association with Alzheimer's disease (D'Iorio, Garramone, Piscopo, Baiano, Raimo & Santangelo, 2018).

A meta-analysis was conducted that found overall, when using informant rated measures Alzheimer's patients were less agreeable when compared to healthy controls (D'Iorio et al., 2018). This may indicate that a high level of agreeableness may act as a protective factor of Alzheimer's disease (D'Iorio et al., 2018).

A systematic review analyzed eighteen studies identifying challenging behavior in people with dementia and their pre-morbid personality traits. The review presented that 72% of the studies they analyzed reported significant relationships between pre-morbid personality and behavior (Soubelet & Salthouse, 2010). A positive relationship was found between pre-morbid neuroticism and mood, aggression, and overall behavioral acts (Soubelet & Salthouse, 2010). Additional findings show that pre-morbid extraversion may have a negative relationship with behavior, and pre-morbid neuroticism may be associated with increased vulnerability to stress (Soubelet & Salthouse, 2010). These results indicate that some personalities may be a protective factor against challenging behaviors in people living with dementia, and other pre-morbid personality traits may be indicative of challenging behaviors if the individual has dementia later in life.

Traits of neuroticism have major public health implications, such that it has been linked to various psychopathological and physical health outcomes (Widiger & Oltmanns, 2017). Therefore, understanding the impact of neuroticism is extremely important and vital for longevity and quality of life. Neuroticism is substantially heritable, and its heritability peaks in early adolescent to early adulthood years (Lahey, 2009). Neuroticism being both a heritable personality trait and an area of public health concern makes the study of neuroticism even more important, especially in groups who already experience heritable public health issues.

Cardiovascular health within the African American community is an immense public health issue facing the community today (Whitfield, Jonassaint, Brandon, Stanton, Sims, Bennett & Edwards, 2010). Cardiovascular disease is not only detrimental to one's physical health, but cognitive health as well. For example, vascular dementia is a type of dementia that is extremely prevalent within the African American community, and it is intuitively linked to cardiovascular health (Whitfield et al., 2010). Results from a study analyzing 234 older African American adults found that those who had higher characteristics of neuroticism reported more cardiovascular health problems (Whitfield et al., 2010). Studies have historically shown that stress can be a risk factor for heart disease. Stress, perhaps from being neurotic, can also cause both physical and cognitive impairments (Whitfield et al., 2010).

Research shows that on days when individuals had high levels of neuroticism, a higher report of memory failures were reported (Neupert, Mroczek, & Spiro, 2008). Additionally, participants with high neuroticism were more cognitively reactive to daily stressors (Neupert et al., 2008). These findings suggest there may be a significant relationship between personality and cognitive health (Neupert et al., 2008). Aiming to explore behavioral relationships between neuroticism and stress responses, a study assessed neuroticism using the NEO Personality Inventory and stress through heart rate, self-reported experiences of stress, and cognitive indicators of stress (Mohiyeddini, Bauer & Semple, 2014). The results indicated that individuals with high neuroticism have a greater tendency to show negative emotional states (Mohiyeddini et al., 2014). Neuroticism was also positively associated with a self-reported experience of stress (Mohiyeddini et al., 2014). These results further illuminate the relationship between

stress and characteristics of neuroticism.

The impact of personality and negative mood states were studied using cognitive domains in 398 community dwelling adults (Booth, Schinka, Brown et al., 2006). The cognitive domains in this study consisted of measures assessing general cognitive ability, executive function, and memory (Booth et al., 2006). Multiple linear analyses were conducted, and the research found that personality traits did in fact contribute significantly to cognitive function (Booth et al., 2006). The relationship between personality traits and cognitive ability in older adults was studied in a meta-analysis analyzing personality traits and assessing their impact on cognitive function and outcomes, to gain a better understanding of personality differences and cognitive aging (Mohiyeddini et al., 2014). Evidence showed that those with high levels of neuroticism were more prone to exhibiting trait anxiety because of stress and arousal (Mohiyeddini et al., 2014). This can result in psychopathological effect because of two reasons: prolonged arousal over a life course may cause neuronal damage and anxiety, and stress can activate the hypothalamic-pituitary-adrenal axis (HPA) axis which release cortisol in response to stress which can impair cognitive performance (Mohiyeddini et al., 2014). There are various findings for both hypotheses as to why high neuroticism may cause poorer cognitive performance, but the theme of prolonged stress and anxiety being a key element is a considerable finding.

In some cases, neuroticism may be found to worsen the adverse association between stress and cognitive performance. Using MRI data a study assessed brain interregional connectivity in 18 individuals, attempting to understand the brain of someone with neuroticism characteristics (Ueda, Kakeda, Watanabe, Sugimoto, Igata,

Moriya & Korogi, 2018). Unique brain regions across the brain related to neuroticism and the interactions of these unique brain regions are likely due to the presence of neuroticism (Ueda et al., 2018). The relationships between daily stressors and people with neuroticism suggested that the “neurotic brain” is less cognitively controlled and as a result can impact information processing, which may be a contributor to the prevalence of poor cognition in those with high neuroticism (Ueda et al., 2018). These findings are extremely interesting in that the brain of someone who is neurotic is unique, and there exists brain atrophy to prove it. Understanding these pathways and the mechanisms that formed them is crucial for understanding what makes the brain of someone with traits of neuroticism and what are the consequences of that. These findings also support the findings of Curtis et al. (2014), that there are unique brain mechanisms at play in the cognitive performance of those with traits of neuroticism.

The influence of personality on cognition is an important area of study, and for the context of this thesis it is imperative to find literature relevant to the African American community within this topic. Research studying correlates between cognitive functioning and personality assessed cognition through verbal learning and attention/working memory measures and personality through the Neuroticism, Extraversion, Openness Personality Inventory Revised, which is a 240-item measurement of personality designed to assess the domains of neuroticism, extraversion, openness, conscientiousness, and agreeableness (Aiken-Morgan, Bichsel, Allaire, Savla, Edwards & Whitfield, 2012). There was a significant negative relationship between neuroticism and verbal learning, and a positive relationship between openness and verbal learning (Aiken-Morgan et al., 2012). An explanation for this relationship is that those with high

neuroticism experience greater levels of stress and anxiety and may cause them to perform worse on cognitive measures (Aiken-Morgan et al., 2012). There was a significant positive relationship between pre-morbid personality and dementia behavior, specifically those with pre-morbid neuroticism traits had a positive relationship with aggression and behavioral acts with dementia (Aiken-Morgan et al., 2012). This may be due to a long-term vulnerability to distress, such is a consequence of neuroticism.

Cumulative Inequality and African Americans

Health inequality became a part of U.S. history very early, and the more America grows and diversifies, the disparities have grown and have become a public health issue (Ferraro, Kemp, & Williams, 2017). Health disparities have been shown to be due to exposure to environmental hazards, poverty, and behaviors that harm health such as smoking, and to limited access to high quality healthcare (Ferraro et al., 2017). African Americans tend to report poorer health, shorter life expectancies, increased disabilities, and a higher rate of cancer and heart disease (Ferraro et al., 2017). Owing to these facts, racial health inequality research was developed to assess the impacts of discrimination and overall health outcomes (Ferraro et al., 2017). Racial health inequality research considers social and environmental forces including cumulative inequality, as an explanation of health outcomes in minority groups (Ferraro et al., 2017). Racism is a large part of American history, impacting all racial minorities, but for the context of this thesis, racism towards African Americans will be the focus. Consequences of racism as it relates to cumulative inequality are poverty and less access to quality health care, quality education, and occupational attainment (Ferraro et al., 2017). A clear example of this in the United States is that public schools were not desegregated until 1954, and this led to a

clear divide between educational attainment between Whites and African Americans. An additional example of racism being a cause of cumulative inequality is that there is an established wage gap between African Americans and Whites, and research reports that this gap arises from occupational choice and educational attainment (Karageorge, 2017). There are also “unexplained factors” that contribute to this gap that research suggests are discrimination, differences in school quality, and differences in opportunity, again relating back to effects of racism in the United States (Karageorge, 2017). Therefore, when exploring African American cognition, simultaneously considering cumulative inequality is vital.

African Americans are highly susceptible to many severe health conditions, such as the prevalence of cardiovascular disease. The prevalence of cardiovascular disease has been present in the African American community for generations, and its prevalence, to some degree, may be explained by cumulative inequality theory. For example, since African Americans have historically dealt with high levels of perceived stress and discrimination over many generations, accumulated stress may be indicative of the extremity of cardiovascular disease within the population (Schulz, Israel, Williams, Parker, Becker, & James, 2000). Personality traits and mortality in 5,450 participants were assessed, and the findings suggest that that socioeconomic status interacted with neuroticism and influenced cardiovascular mortality risk (Hagger-Johnson, Roberts, Boniface, Sabia, Batty, Elbaz & Deary, 2012). Low socioeconomic status and high neuroticism increased the risk of cardiovascular disease mortality (Hagger-Johnson et al., 2012). This relationship was analyzed further, and the researchers found that these results were not influenced by exterior health behaviors or physiological variables previously

present (Hagger-Johnson et al., 2012). Furthermore, the findings relating to an interaction effect between neuroticism, socioeconomic status, and cardiovascular mortality were significantly represented in the sample of women in the study (Hagger-Johnson et al., 2012). Interestingly, the study also found that those with high neuroticism and high socioeconomic status were at a lower risk of cardiovascular disease mortality, which may indicate that high socioeconomic status may be a protective factor against certain physiological health outcomes (Hagger-Johnson et al., 2012).

Cumulative Inequality and Cognition

According to cumulative inequality theory, cumulative inequality may lead to premature mortality. Cumulative inequality can be both the result of inequalities over the life course or inequalities accumulated across generations: these can go hand in hand. A population based longitudinal study assessed the relationship between cumulative experiences of discrimination and its effects on health (Gonzales, Jung & Wang, 2018). African American participants experienced higher levels of discrimination, lower levels of health at baseline, and greater levels of depression and lower levels of cognition in comparison to their White counterparts (Gonzales et al., 2018). This study offered strong support for cumulative disadvantage to have a direct impact on health outcomes, both physical and cognitive.

Another facet of cumulative inequality is socioeconomic status. Socioeconomic disadvantage as a consequence of cumulative inequality can impact overall quality of life, longevity, physical health, cognitive health, and mortality. A study using data from a 12-year observation period attempted to examine if there was a relationship between life course socioeconomic status and cognitive functioning in older adults (Lyu & Burr,

2015). Socioeconomic disadvantage during childhood was associated with lower cognitive function at baseline in this sample, and those who had higher cumulative socioeconomic advantage over the 12-year period had an advantage in cognitive function (Lyu & Burr, 2015). These results indicate that socioeconomic disadvantage is a risk factor for poor cognition in later life (Lyu & Burr, 2015). This further supports cumulative inequality theory such that life course trajectories are shaped by the accumulation of risk and disadvantages, being socioeconomic disadvantage in this case. Likewise, a study done in older Swedish adults found that childhood living conditions impact cognitive function in later life (Fors, Lennartsson & Lundberg, 2009). Living conditions were categorized by economic hardship, number of siblings, social class of father, broken home, and conflicts in childhood family (Fors et al., 2009). Economic hardship and social class are direct representations of socioeconomic status. Social class of father, conflicts, low education of father, and a father who did manual labor were all associated with lower cognitive functioning in the older adults in this study (Fors et al., 2009). These results indicate that living conditions of a child, some of which are a consequence of socioeconomic status, can in fact impact cognition later in life. Brown (2010) further supported these notions with her findings from analyzing early life characteristics and psychiatric history. Using data from six waves of the Health and Retirement Study, the results suggest that a combination of childhood disadvantage and psychiatric problems impacts cognitive function, furthering support that cumulative disadvantages morph cognitive health in later life (Brown, 2010).

Data from three waves of the Health and Retirement survey support the relationship between socioeconomic state and health. Smith suggests that the influence of

socioeconomic status on health is strongest during childhood and early adulthood (Smith, 1998). Further, this work presented that new health events have effects on wealth accumulation in individuals in their 50s (Smith, 1998). This article adds to the support that socioeconomic status and health have a major relationship, and those who are of low socioeconomic status need to be assessed for health disparities to further explore the causal relationship (Smith, 1998).

This thesis will add to the literature on the associations between personality and cognition. What makes this proposed study unique is that it will assess each personality trait and its influence on cognition in a strictly African American sample. Personality in African Americans specifically has not been sufficiently studied and there has been literature explaining that with the African American experience, upbringing, and culture, African American personality may need to be measured in a different way to accurately understand the multifaceted dimensions of the African American personality. Although this thesis will use the five-factor personality theory, a critique on measurement of African American personality still bears mentioning. Since there is a disproportionate prevalence of dementia in the African community, it is important to explore any area that may serve as a protective factor or identify anything that may be a new risk factor to this population. Based on the literature, black personality is different in its origin and how it is expressed, it bears mentioning if there is any aspect of personality in African Americans that may be affecting cognition. This thesis will attempt to bridge the gap as it pertains to cognitive health and outcomes for African Americans.

The study, “Five-Factor Personality Dimensions, Mood States and Cognitive Performance in Older Adults,” reported that openness had a significant relationship with

verbal memory and general cognitive ability, and this may be due to lifelong patterns in education or hobbies (Booth et al., 2006). Cumulative Inequality theory is a notable sociological theory, in aging, assessing how cumulative inequality affects the life course (Merton, 1988).

An additional gap in the literature is measurements to fully assess African American personality in a way that is quantifiable. Joseph Baldwin in some of his literature spoke of measures of black personality he was attempting, but these may not have been widely accepted, or maybe not generalizable, as there were not many traces or mentions of it outside of his own work. Further research may want to explore different measures in assessing black personality and trying to understand what exactly it is about black personality that needs to be captured to assess and analyze this personality on external variables. A study saw some gaps in the literature and did this analysis for that exact reason. These researchers found that there may be precision issues of the Abridged Big Five Circumplex in item functioning by gender and ethnicity (Mitchelson, Wicher, LeBreton, & Craig, 2009). Because personality measures are usually self-reported measures, it is important that items on these measures are accurately assessing people and considering ethnic and gender differences (Mitchelson et al., 2009). This paper served as additional support that there are some gaps in how variant groups are included in certain measures and how this is something that should be considered in future research.

This thesis will not propose new personality measures, but still offers valuable information to consider for the scope of this study which is assessing if personality, as standardly measured, influences cognition and memory in older age. Do any of the presented personality traits in the Big 5 present as risks or protective factors within this

demographic? This study is attempting to add to the body of literature by assessing if minority groups, in this case, African Americans show differences in personality leading to cognitive decline later in life, again this is specifically important because of the impactful prevalence of dementias in the African American community.

A study within this topic is important due to the severity of health disparities in the African American community. Severe disparities in both physical and cognitive health are very prevalent in the African American community and due to this fact, it is important to assess any aspect that may be an additional contributor to these health disparities. Personality is a unique measure to look at because personality is severely impacted by one's upbringing, childhood experiences, sociodemographic, and culture.

The conceptualization of this thesis begins with analyzing disparities as they impact African Americans. African Americans historically have been negatively impacted by societal structures, be that discrimination and racism, the wealth gap, or facets of educational discrimination and disparities (Shapiro, Meschede, & Osoro, 2013). Although there have been major improvements on the treatment and equality of African Americans, the long-term implications and impacts of these inequalities and discrimination will intuitively have an impact on African Americans as a group across generations and cohorts. Aligned with these facets of discrimination, one must question the connection between racial discriminations African Americans face and disproportionate health effects within the African American community. For example, hypertension disproportionately effects African Americans and genetic and environmental factors contribute to that (James, 1994). Further, socioeconomic status, which can be directly impacted by inequalities and discrimination, have been found with

extensive literature support to be inversely related to hypertension (James, 1994). In attempting to understand the external mechanisms that impact African Americans that may also relate to socioeconomics, the idea of personality becomes relevant.

Personality refers to the pattern of thoughts, feelings, and behaviors that tend to reflect the way an individual conducts themselves in society and how they respond to certain things under certain circumstances (Matthews, Deary & Whiteman, 2003). What makes personality intriguing are factors thought to form personality which are: physical environment, heredity, experiences, and culture circumstances (Matthews et al., 2003). This thesis is analyzing the influence of personality on cognition with cumulative inequality as a secondary framework because of these four domains. Cumulative inequality refers to how inequalities develop and a large part of how inequalities develop are due to external factors such as, two of which are facets that encompass personality, physical environment, and experiences (Ferraro & Shippee, 2009). An individual's physical environment is going to vary based on certain socioeconomic domains. For example, an individual who is born into a two-parent household, with a high income, living in a prosperous and safe suburb is going to have a different early life experience than an individual who lives in a single parent household, with a low income, and living in a low-income inner-city residence. This is not to say these two individuals cannot possibly accomplish the same goals, but the route to obtain these goals and overcome certain obstacles will vary based on access to resources. These two individuals' upbringings are going to vary quite differently, as they will be exposed to different life events and experiences. Events and experiences shape a person, and these are examples of advantages and disadvantages that cumulative inequality refers to, that personal

trajectories are shaped by the accumulation of risk, available resources, perceived trajectories, and human agency (Ferraro & Shippee, 2009). Individuals who at a young age are introduced to certain advantages are set to continue to advance, whereas others without certain advantages must overcome a number of barriers to advance. These are mostly due to societal inequities amongst groups. Cumulative inequality theory also refers to not only an individual's life course, but generations as well (Ferraro & Shippee, 2009). Similarly, there are traits of personality, as mentioned before are hereditary. The conceptualization of this thesis is based the presence of sociodemographic and socioeconomic influence on both personality and on cognition. Socioeconomic status, as the literature reports, is an important factor in cognitive, social, and brain development (Duncan & Magnuson, 2012). Further, there is research showing that individuals with low socioeconomic status in early life have poorer cognition when compared to those with higher socioeconomic status in early life, further supporting the theory of cumulative inequality (Hughes, Costello & Pearman, 2021). Cognition, the variable of interest in this study has been shown in the literature to relate to both personality (ex; individuals with high levels of openness, a big five personality trait, have high levels of educational attainment) and areas of socioeconomics (ex; individuals with low socioeconomic status having poorer cognition). In short, there are relationships between certain areas of socioeconomic status and both personality and cognition over the life course, and understanding these mechanisms separately presented the question this thesis poses of, what influence does personality have on cognition in a solely African American sample a group that has historically suffered various disadvantages that has directly impacted socioeconomic status.

III. RESEARCH DESIGN AND METHODOLOGY

Participants

The data used this thesis is from the Midlife in the United States national longitudinal study (MIDUS, <http://midus.wisc.edu/>). The study is a national longitudinal study of health and well-being and the data captured by different protocols including survey measures, cognitive assessments, daily stress diaries, clinical, biomarker and neuroscience data, separately (Radler, 2014). The MIDUS consists of a national sample of American adults aged 25-74. The baseline survey data (MIDUS 1) consisting of 7,108 individuals were collected from 1995-1996. The first (MIDUS 2) and the second follow-up waves (MIDUS 3) were completed in 2009 and 2014, respectively. Data on cognitive function were collected in MIDUS 2 and MIDUS 3. There were 3,683 individuals participated in the baseline and the follow-up surveys, of those, 2,956 participated in the cognitive assessments in MIDUS 2 and MIDUS 3. The MIDUS has continued to increase its sample since baseline. In 2005, 592 African Americans from Milwaukee were added to the MIDUS 2 sample to examine health issues in minority populations. Respondents were interviewed in their homes using a Computer Assisted Personal Interview (CAPI) survey protocol and asked to complete and return a Self-Administered Questionnaire (SAQ). The average length of completion for the CAPI instrument was 153 minutes. The SAQ is a 44-page test done independently by the respondent. Afterwards these individuals were eligible for participation in the same research protocol as the national MIDUS 2 sample, including cognitive, daily stress, biomarker, and neuroscience projects.

The current study used the data selected from the Milwaukee African American sub-sample in MIDUS 3. These data are publicly restricted due to the relatively small

number of African Americans in the sample compared to their White counterparts, making it difficult to keep their identities confidential. Given that the survey protocol and the protocol of cognitive assessment were two separate data files, the current study combined the two protocols into one data file, using participants' identification numbers. This thesis combined the two data files primarily first by identifying the participants who had participated and reported data in both data files, and second by using respondent ID. For the cognitive project, the data file had to be cleaned to account for only African Americans and those who had completed all of the cognitive tests being analyzed in this thesis. From there the data were merged, using the merge files application on SPSS. After this, these data were cleaned to account for any missing values across all variables, resulting in the 94 participants for data analysis.

Measures

Personality (Openness, Conscientiousness, Extraversion, Agreeableness, and Neuroticism)

All personality measure scores were derived using the Midlife Development Inventory Personality Scales (MIDI; Lachman & Weaver, 1997). This measure was piloted in 1994 specifically to assess personality in the MIDUS surveys. The researchers developed this measure through regression analysis that determined the smallest number of adjectives to describe each of the big five personality traits, being, openness, conscientiousness, extraversion, agreeableness, and neuroticism. The Midlife Development Inventory Personality Scale responses are based on a Likert Scale, 1 being 'a lot', 2 being 'some', 3 being 'a little', and 4 being 'not at all'. All scores were then reverse-coded such that high scores reflect high standing. Mean level scores were found

for each personality trait based on the sum of the Likert scale score for each personality, then divided by the number of items associated with that trait. Each participant had five mean scores with each score for each personality trait and the highest mean score indicated the individual's actual personality. For the context of this thesis, personality scores were dichotomized such that those that scored a '1' or a '2', would be coded as '0' representing a low score of that personality and scores of '3' or '4' are coded as '1' indicating a high score of that personality. Each personality had a certain number of items, and the items corresponded with adjectives that are representative of that specific trait. Section C, question 7 on the Self-Administered Questionnaire (SAQ) in this study is what the authors used to assess personality. Question seven states, "how well does the following describe you?" The question then listed each adjective 'a' - 'ee' and the respondent had to provide a response for each adjective based on the Likert scale. Please refer to the appendix for supplemental documentation to exhibit the personality test as done in the MIDUS data collection. The following table provides descriptions of each personality trait as assessed in this dataset.

Table 1
Personality Descriptions

	Number of Items	Adjectives describing personality trait
Openness	7	Creative, Imaginative, Intelligent, Curious, Broad-Minded, Sophisticated, and Adventurous.
Conscientiousness	4	Organized, Responsible, Hardworking, and Careless
Extraversion	5	Outgoing, Friendly, Lively, Active, and Talkative
Agreeableness	5	Helpful, Warm, Caring, Softhearted, and Sympathetic
Neuroticism	4	Moody, Worrying, Nervous, and Calm

Note: This table includes the number of items and appropriate descriptions for each personality trait as described in the MIDAS protocol.

Cognition

The Cognitive Project from 2013-2017 consists of a phone survey called the Brief Test of Cognition via Telephone (BTACT). There is documentation describing the BTACT further in the appendix section (Appendix B). The BTACT includes seven subtests that provide an index of cognitive functioning. The following table describes each of the seven BTACT subtests.

Table 2
Cognitive Test Descriptions

	Number of items	Domain of cognition being assessed	Description of test
Immediate Word List Recall Test	15	Episodic Memory	This test consists of a 15-word list from the Rey Auditory Learning test. The respondent must try and recall the words back from memory.
Digit Backward Span test	Varies	Working Memory (Executive Function)	Test using the Weschler Adult Intelligence Scale. The respondent is asked to repeat strings of digits, ranging from 2–8-digit strings, and were tasked with repeating the strings in the reverse order in which they were heard. Each increasing question, increased difficulty.
Category Fluency Test	-	Executive Function	In this test respondents are tasked with saying words from a specific category, in this case the category was animals, and saying as many animals as possible in one minute.
Number Series Test	-	Indicative Reasoning (Executive Function)	This task asks the respondent to complete the pattern in a series of five numbers with a final number. For example, the participant might be given this number series ‘1 __ _9,’ and they are tasked with figuring out the missing numbers in the series.
Backward Counting Test	-	Executive Function	The backward counting is similar in nature and assessing the same domains as the digits backward span test.
Delayed Word List Recall Test	15	Episodic Memory	The respondents were instructed to listen carefully to a 15-word list and then the participant is tasked with recalling as many of the 15 words as they can in one minute.

Note: This table includes the cognitive test measures used in this thesis, what domain of cognition it assesses, and a brief description of that measure.

For this thesis, standardized scores were created to measure episodic memory and executive function. Episodic memory scores combined the scores from the Word List Immediate test and Word List Delayed test. Both of these tests were scored in the same way and had the same dispersion of scores; these two scores (word list immediate total

unique items and word list delayed total unique items) were therefore transformed on SPSS to measure episodic memory. The tests that MIDUS used to assess executive function are as follows: Digits Backward test, Category Fluency test, Number Series test, and Backward Counting test. Because the scores of these tests used different scales, factor scores were generated on SPSS, using the highest number of digits recalled in the Digits Backward test, total number of unique items in the Category Fluency test, the total correct in the number series test, and finally, the total number counted correctly in the Backwards Counting test. The factor analysis tool on SPSS allowed for the creation of one new variable for each factor included in the analysis, in this case the aforementioned tests. The scores that are produced have a mean of 0. The cognition measures for this thesis are therefore episodic memory and executive function, and these scores were used in analyses.

The sociodemographic measures used as controls in the analyses of this thesis are, age at the time of assessment, gender, highest level of education obtained, current marital status, pre-tax income last calendar year, current self-rated physical health (rated from excellent (1) to poor (4)), and self-rated mental health (rated from excellent (1) to poor (4)).

The respondent is asked, “what is your current age in years,” and their open response was then recorded.

The respondent is also asked, what is your sex (gender), then the respondent would respond with either “male” coded as ‘1’ or “female” coded as ‘2’.

In relation to education, the respondent is asked, “what is the highest grade of school or year of college you completed?” and their response is then recorded.

Household income in the last calendar year was surveyed as follows, “In the last calendar year what was your, your spouse, or any other family member in your household income from wages, salaries, and other stipends from all your jobs, including self-employment? Do not include pensions, investments, or any other financial assistance or non-wage income.” Additionally, for this thesis, the income was log transformed for analyses.

Both physical and mental health rating questions were surveyed as follows, “In the past 12 months, how would you rate your physical health, then the respondent would answer based on the Likert scale from 1, ‘excellent,’ to 4, poor. The same was done for mental health. For the analyses conducted in this thesis, the scores were then recoded as 0 and 1. 0 represents scores ‘3’ and ‘4’ which is poor and 1 represents scores ‘1’ and ‘2’ which is good.

The question about marital status asks the respondent, “Are you married, separated, divorced, widowed, or never married? The respondent then chooses the corresponding answer. 1 is married, 2, separated, 3, divorced, 4, widowed, 5, never married, 7, don’t know/ not sure, 8 is refused to answer and nine is not applicable. For the analyses conducted in this thesis, scores were recoded into 0 and 1. 0 representing not married and 1 representing married.

Procedure

This thesis reports results from correlation analyses, Analysis of Variance (ANOVA) tests and Analysis of Covariance (ANCOVA) tests in order to evaluate the overarching hypothesis. Additionally, frequencies, means, and missing values were examined. These correlation analyses attempted to address if there is a significant

relationship between personality and cognitive function. The analysis of variance attempts to identify if cognition varies significantly by personality type in African Americans. Included in the data analyses are the data from those African American participants who completed the MIDUS 3 assessments, then moved forward to the Cognitive Project with reported scores, only including those who were grouped in the Milwaukee group from the Cognitive Project. From these inclusion criteria this thesis has a sample size of 94 ($N=94$). All analyses were conducted, using primary sources, and using the statistical software, Statistical Package for Social Sciences 27 (SPSS).

The sample size for this sample was found by using only MIDUS data from the MIDUS 3: Milwaukee African American sample 2016-2017, then using only Cognitive Project data for those in the Milwaukee group, making the sample size 94 African American adults. 65.3% of this sample are female and 34.7% are men. Within this sample, the average age is 61 years old (ages ranging from 44-94). The cognition measure descriptives are reported below in Table 3 as follows.

Table 3

Cognitive Descriptive Statistics

	<i>N</i>	Range	Minimum	Maximum	Mean	Standard Deviation	Variance
Executive Function	323	5.44	-2.57	2.88	0.00	1.00	1.00
Episodic Memory	312	26.00	1.00	27.00	9.99	5.16	26.62

The personality scores are reported as individual means that were already reverse coded in the data. Frequency analyses were conducted as the descriptives of each personality trait, openness, conscientiousness, extraversion, agreeableness, and neuroticism. Because personality scores were based on means ranging from 1-4, 4 being the highest, the frequencies show that in this sample agreeableness, extraversion,

openness, and conscientiousness scores were high, with all the highest frequencies being above 3.0, reflecting an overall high standing. Neuroticism's highest frequencies were within the range of 1.75- 2.25, reflecting a lower overall standing.

The measures for sociodemographic controls means are as described below in Table 4.

Table 4
Sociodemographic Control Descriptions

	Descriptions
Gender	65.3% women, 34.7% men
Marital Status	75.5% unmarried, 24.4% married
Education	28.9% 1-2 years of college 24.7% graduated from high school 15.2% some high school but no diploma 7.5% graduated from a 2-year college or vocational school 6.7% graduated from a 4- or 5-year college with a bachelor's degree 5.4% have a master's degree 4.4% have a GED, and 1.8% have a professional degree
Self-Rated Mental Health	22.8% "poor or fair" 77.2% "good, very good, or excellent"
Self-Rated Physical Health	39% "poor or fair" 61.1% "good, very good, or excellent"
Household Income	Mean: \$45,556 Standard Deviation: \$45,017.38

IV. RESULTS

The analyses conducted in this thesis include descriptive statistics and inferential analysis. Descriptive analysis was used to estimate the frequency, mean, range, and missing values in the sample. Analysis of Variance (ANOVA) tests and Analysis of covariance (ANCOVA) were used for comparing the mean difference in the cognitive outcomes across different personality traits.

One correlational matrix presented here is the correlational matrix for sociodemographic controls. This table gives more insight as to the role sociodemographic play within this sample, before seeing their influence in the correlation analysis amongst personality and cognition variables. Table 5 describes the significant relationships amongst the sociodemographic covariates.

Table 5*Sociodemographic Controls Correlational Matrix*

		Age	Sex	Highest level of Education	Marital Status Currently	Self- Reported Physical Health	Self- Reported Mental Health	Household Income
Age	Correlation	1.00	0.09	-0.06	-0.13	0.02	-0.04	-0.27
	p-value	--	0.09	0.22	0.01*	0.78	0.42	0.00**
Sex	Correlation	0.09	1.00	0.00**	0.27	-0.02	-0.13	-.123
	p-value	0.09	--	0.99	0.00**	0.74	0.02*	0.06
Highest Level of Education	Correlation	-0.06	0.00**	1.00	-0.09	0.08	0.23	0.37
	p-value	0.22	0.99	--	0.09	0.14	0.00**	0.00**
Marital Status Currently	Correlation	-0.13	0.27	-0.09	1.00	0.00**	-0.06	-0.12
	p-value	0.01*	0.00**	0.09	--	0.94	0.23	0.07
Physical Health	Correlation	0.02	-0.02	0.08	0.00**	1.00	0.32	0.07
	p-value	0.78	0.74	0.14	0.94	--	0.00**	0.30
Mental Health	Correlation	-0.04	-0.13*	0.23	-0.06	0.32	1.00	0.14
	p-value	0.42	0.02*	0.00**	0.23	0.00**	--	0.03*
Household Income	Correlation	-0.27	-0.12	0.37	-0.12	0.07	0.14	1.00
	p-value	0.00**	0.06	0.00**	0.07	0.30	0.03*	--

Note: * *p-value* <0.05 and ** *p-value* <0.001. Dashes signify that information was not available

Table 6 is the correlational matrix for these variables without the use of control variables. Correlational analyses were conducted between each of the five-factor personalities and the cognitive measures. One of the primary interests in this study is to understand if personality has an influence on domains of cognition. This correlational

matrix explores these relationships without the use of any of the sociodemographic variables to provide a baseline for the associations between these variables.

Table 6

Correlation Matrix without Control Variables

		Agreeablen ess	Extravers ion	Neurotici sm	Conscientious ness	Openn ess	Episod ic Memo ry	Executi ve Functio n
Agreeableness	Correlati on	1.00	0.73	-0.17	0.65	0.61	-0.01	0.16
	p-value	--	0.00**	0.02*	0.00**	0.00**	0.82	0.01*
Extraversion	Correlati on	0.73	1.00	-0.22	0.70	0.78	0.00	0.11
	p-value	0.00**	--	0.00**	0.00**	0.00**	0.10	0.11
Neuroticism	Correlati on	-0.17	-0.22	1.00	-0.32	-0.24	-0.13	-0.10
	p-value	0.02	0.00**	--	0.00**	0.00**	0.08	0.15
Conscientious ness	Correlati on	0.65	0.70	-0.32	1.00	0.74	0.10	0.07
	p-value	0.00**	0.00**	0.00**	--	0.00**	0.15	0.30
Openness	Correlati on	0.61	0.78	-0.24	0.74	1.00	0.18	0.26
	p-value	0.00**	0.00**	0.00**	0.00**	--	0.01*	0.00**
Episodic Memory	Correlati on	-0.01	0.00**	-0.13	0.10	0.18	1.00	0.37
	p-value	0.82	0.10	0.08	0.15	0.01*	--	0.00**
Executive Function	Correlati on	0.16	0.11	-0.10	0.07	0.26	0.37	1.00
	p-value	0.01*	0.10	0.15	0.30	0.00**	0.00**	--

Note: * *p-value* < 0.05 and ** *p-value* < 0.001. Dashes signify that information was not available

This correlational matrix shows significant associations without the control variables. There is a significant relationship between agreeableness and executive function as shown in Figure 1 ($r=0.16$, $p=0.01$). This correlation insinuates that those with higher agreeableness scores also scored better on tests assessing for executive function, exhibiting a positive and significant relationship between agreeableness and executive function. Openness had a significant relationship with both episodic memory ($r=0.18$, $p=0.01$) and executive function ($r=0.26$, $p=0.00$). This relationship exhibits that respondent with high levels of openness scored highly in both episodic memory and executive function tests, describing a significant and positive relationship between openness and both episodic memory and executive function, such that as openness increases, as does executive function and episodic memory. Episodic memory and openness' relationship is represented in Figure 2 and the relationship between openness and executive function is shown in Figure 3.

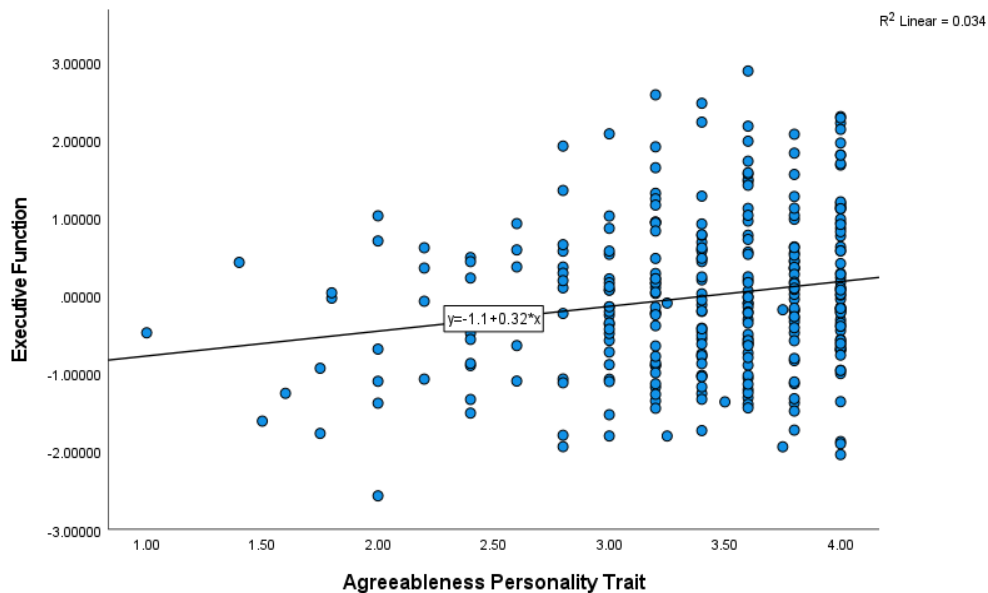


Figure 1: Agreeableness and Executive Function Scatterplot

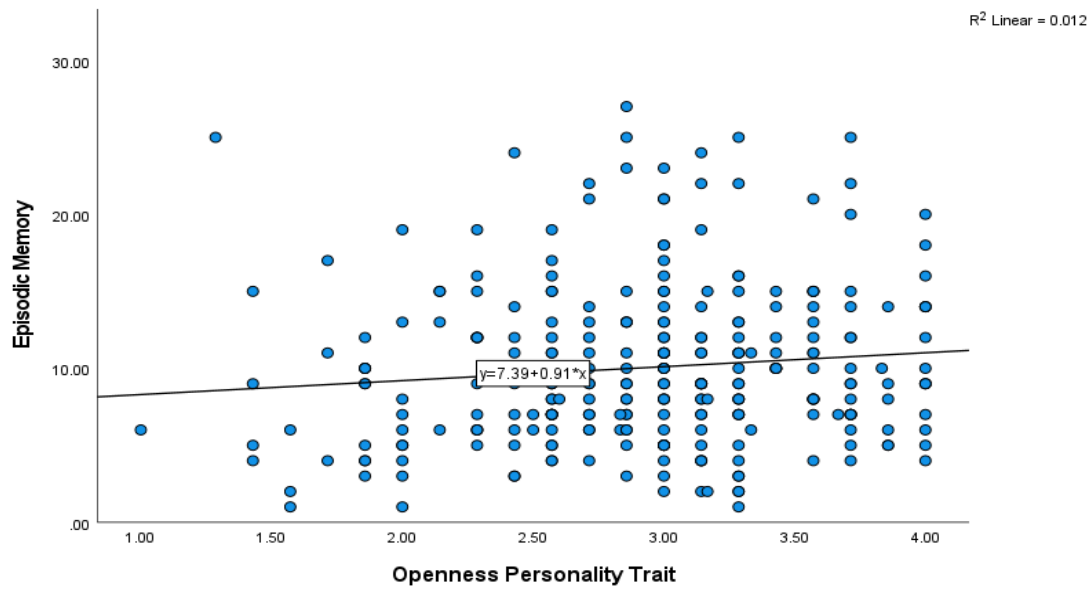


Figure 2: Openness and Episodic Memory Scatterplot

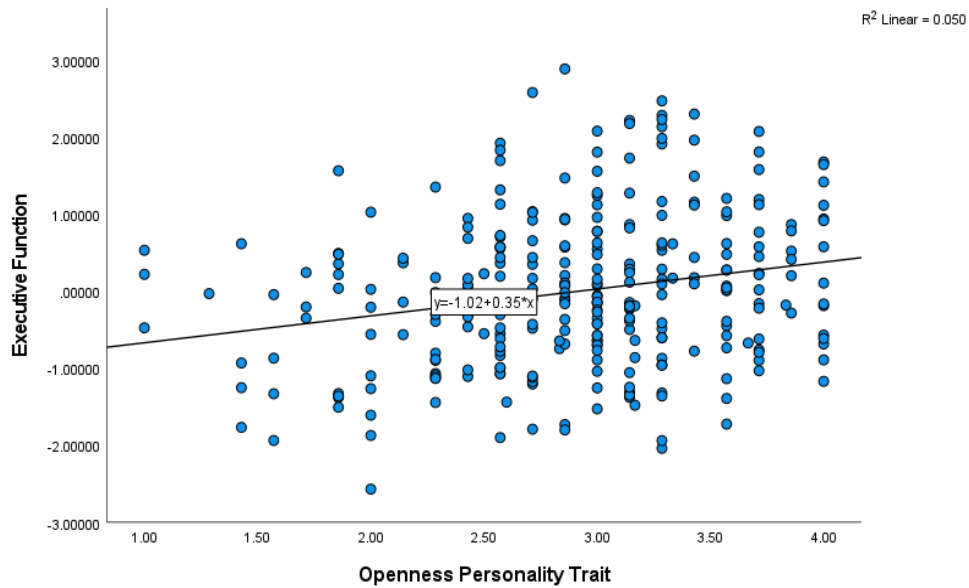


Figure 3: Openness and Executive Function Scatterplot

Table 7 is the correlational matrix between all variables, but while analyzing with the control variables. Correlational analyses were conducted between each of the five-factor personalities and episodic memory and executive function.

Table 7*Correlation Matrix with Control Variables*

		Agreeableness	Extraversion	Neuroticism	Conscientiousness	Openness	Episodic Memory	Executive Function
Agreeableness	Correlation	1.00	1.00	0.10	1.00	1.00	0.27	-0.04
	Significance	--	0.00**	0.47	0.00**	0.00**	0.06	0.81
Extraversion	Correlation	1.00	1.00	0.10	1.00	1.00	0.27	-0.04
	Significance	0.00**	--	0.47	0.00**	0.00**	0.06	0.81
Neuroticism	Correlation	0.10	0.10	1.00	0.10	0.10	-0.05	-0.24
	Significance	0.47	0.47	--	0.47	0.47	0.75	0.09
Conscientiousness	Correlation	1.00	1.00	0.10	1.00	1.00	0.27	-0.04
	Significance	0.00**	0.00**	0.47	--	0.00**	0.06	0.81
Openness	Correlation	1.00	1.00	0.10	1.00	1.00	0.27	-0.04
	Significance	0.00**	0.00**	0.47	0.00**	--	0.06	0.81
Episodic Memory	Correlation	0.27	0.27	-0.05	0.27	0.27	1.00	0.21
	Significance	0.06	0.06	0.75	0.06	0.06	--	0.14
Executive Function	Correlation	-0.04	-0.04	-0.24	-0.04	-0.04	0.21	1.00
	Significance	0.81	0.81	0.09	0.81	0.81	0.14	--

Note: * p -value <0.05 and ** p -value <0.001 . Dashes signify that information was not available

The correlational matrix in Table 7 shows no statistical significance between personality scores and executive function and episodic memory. The results for the relationship between personality and cognitive tests are all reported while controlling for age, sex, highest level of education, current marital status, physical health, mental health, and household income for the last calendar year.

Prior to presenting the results of the ANCOVA, this thesis will present the findings of the ANOVA between measures of personality and cognition. This will present if there are significant changes in cognition based on a specific personality trait. The results of these ANOVA's are as follows.

Table 8

Openness ANOVA

Dependent Variable		Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Openness	Executive Function	12.46	1.00	12.46	12.43	0.00	0.06
	Episodic Memory	147.36	1.00	147.36	5.39	0.02	0.03

Note: * p -value <0.05 and ** p -value <0.001 . Dashes signify that information was not available

Episodic memory and executive function both statistically significantly varied by levels of openness as presented in Table 8. There was a statistically significant difference between the more open group and those with in terms of cognition determined by this one-way ANOVA for Episodic Memory ($F(1,183) = 5.39, p=0.02$) and for Executive function ($F(1,183) = 12.46, p=0.00$), such that openness made a statistical difference on the means on both domains of cognition. The Partial Eta score of 0.06 (Executive Function) and 0.03 (Episodic Memory) represent a small effect in this relationship and that 3% of the variance in Episodic Memory can be explained by openness and 6% of the

variance in Executive function can be explained by the openness personality trait.

Table 9

Agreeableness ANOVA

	Dependent	Type III Sum of	Mean			Partial Eta	
	Variable	Squares	df	Square	F	Sig.	Squared
Agreeableness	Executive	7.55	1.00	7.55	7.55	0.01	0.03
	Function						
	Episodic Memory	1.12	1.00	1.12	0.04	0.84	0.00

Note: * p -value <0.05 and ** p -value <0.001 . Dashes signify that information was not available

Episodic memory and agreeableness had a statistically significant relationship as represented in Table 9. There was a statistically significant difference between groups of cognition determined by this one-way ANOVA ($F(1,250) = 7.55, p=0.04$), such that the personality agreeableness made a statistical effect on the mean scores of episodic memory tests. The Partial Eta score of 0.03 represents a small effect in this relationship and that 3% of the variance in Executive function can be explained by agreeableness. The aforementioned results indicate that amongst all five of the tested personality traits, agreeableness and openness provided the most positive and significant effect on cognitive performance.

The analysis of covariance (ANCOVA) was used to attempt to address this thesis' question of, is there a relationship between personality and cognition in African Americans while considering sociodemographic controls. ANCOVA was used to control for specific variables to adequately assess the hypothesis.

The ANCOVA as they relate to personality and cognition scores solely did not produce significant results. Although, all the ANCOVA models were significant, indicating that one or more of the covariates tested for effected the cognitive domains;

Openness (Episodic Memory ($F=3.50, p=0.00$) and Executive Function ($F=4.38, p=0.00$)), Conscientiousness (Episodic Memory ($F= 4.13, p=0.00$) and Executive Function ($F=3.19, p=0.00$)), Extraversion (Episodic Memory ($F= 3.77, p=0.00$) and Executive Function ($F=4.64, p=0.00$)), Agreeableness (Episodic Memory ($F= 3.31, p=0.00$) and Executive Function ($F=3.90, p=0.00$)), and lastly Neuroticism (Episodic Memory ($F= 4.11, p=0.00$) Executive Function ($F=2.10, p=0.04$)).

Openness

Although openness did not have a significant effect on cognition in this ANCOVA, there are still interesting findings. Of all the respondents in the sample 8 of them scored in the zero category, meaning they had low openness and the remaining 96 respondents were in the ‘one’ category representing high openness exhibiting that this sample consisted greatly of highly open individuals.

Conscientiousness

Conscientiousness did not have a significant effect on cognition in this ANCOVA test. Nevertheless, of all the respondents in the sample 4 of them scored in the zero category, meaning they had low conscientiousness and the remaining 122 respondents were in the ‘one’ category representing high conscientiousness exhibiting that this sample consisted greatly of highly conscientious individuals.

Extraversion

Extraversion also did not have a significant effect on cognition in this ANCOVA test. Of all the respondents in the sample 7 of them scored in the zero category, meaning they had low extraversion and the remaining 104 respondents were in the ‘one’ category representing high extraversion exhibiting that this sample consisted greatly of highly

extraverted individuals.

Agreeableness

Agreeableness did not have a significant effect on cognition in this ANCOVA test. Of all the respondents in the sample 6 of them scored in the zero category, meaning they had low agreeableness and the remaining 127 respondents were in the 'one' category representing high agreeableness exhibiting that this sample consisted greatly of highly agreeable individuals.

Neuroticism

Neuroticism did not have a significant effect on cognition in this ANCOVA tests. Of all the respondents in the sample 88 of them scored in the zero category, meaning they had low neuroticism and the remaining 17 respondents were in the 'one' category representing high neuroticism exhibiting that this sample consisted greatly of highly non-neurotic individuals.

V. DISCUSSION

As outlined in the literature review of this thesis, there is plausible evidence that personality may have influence on cognition. McCrae and Costa's (2008) work essentially spearheaded this with their publications that can act as a resource and starting point for future researchers studying this area. The five-factor personalities (openness, conscientiousness, extraversion, agreeableness, and neuroticism) have in some way related to areas of cognition, but the further investigation of these relationships is crucial in gaining a better understanding of the derivation and causes of this relationship particularly in the African American population.

The results of the correlational matrix without controls in this study indicate that there is a significant relationship between openness and agreeableness, and areas of cognition. Executive function refers to higher level cognitive skills that one may use to coordinate other cognitive abilities and processes necessary for the cognitive control of behavior (Gilbert & Burgess, 2008). Additionally, executive function assists in goal-directed behavior, organization or responses, future oriented actions. Executive function has also been found to possess individual differences in both health behavior trajectories and longevity (Hall & Fong, 2013). Correspondingly, executive function requires high level cognitive skill, thus still supporting the notion of personality and cognition possessing a relationship.

Episodic Memory refers to a type of long-term neurocognitive memory that allows individuals to recall events of their past (Tulving., 1993). Often episodic memory comes in the sense of reliving a moment from one's past, and in some literature is referred to mental time travel. Unfortunately, in aging and in diseases that impact

cognitive functioning, like Alzheimer's disease, episodic memory is amongst the first to be impacted (Pause, Kinugawa, Pietrowsky, & Dere, 2013).

The following sections will provide more support for the relationships of agreeableness, and openness with cognition.

Openness

As previously noted, openness is highly associated with self-control and self-discipline. This may result in better and healthier lifestyle behaviors leading to better cognition in later life (Curtis et al., 2015). Research shows that higher openness has been associated with higher performance across cognitive tests. In explaining for these results, it has been hypothesized that those with high levels of openness are more actively engaged in cognitively stimulating activities (Sharp et al., 2010). In relation to cognitively stimulating activities, a study provided results that showed openness had an association with time spent in number of daily activities such as writing, volunteering, reading, artistic activities, and others of the like (Jackson, Hill, Payne, Roberts & Stine-Morrow, 2012). Further, the study assessed openness and the most cognitively demanding activities used in the study (puzzles, computers, working, etc.), and openness still significantly related to time spent in these specialized categories of cognitive activities (Jackson et al., 2012). An explanation for this relationship between openness, activity engagement, and cognition may be attributed to cognitive reserve. Cognitive reserve refers to how flexibly and efficiently an individual can make use of their available brain reserve (Tucker & Stem, 2011). Things that can contribute to cognitive reserve are domains such as education, occupational attainment, engagement in leisure activities, a supporting and integral social network, and literacy (Tucker & Stem, 2011). Cognitive

reserve has also been shown to exhibit better cognitive outcomes in those with Alzheimer's disease, vascular injury, Parkinson's disease, and traumatic brain injury (Tucker & Stem, 2011). Something that is interesting in the assessment of cognitive reserve is that many of the variables used to measure it are measures of socioeconomic status (Tucker & Stem, 2011). The findings of this study only reported significant influence of openness and measures of cognition while controlling for sociodemographic factors, which include measures of socioeconomic status, i.e., education. The concept of cognitive reserve supports the idea that results of cumulative inequality, like inequity across socioeconomic statuses across racial groups, need to be considered when assessing cognition. Research shows that individuals with higher openness have greater activity in older age, strengthening their cognitive reserve and resulting in a smaller decline in cognition and executive functioning (Ihle et al., 2019). Openness may act as a protective factor against certain domains of cognitive decline. Thus, it is important to understand the origin and mechanisms that contribute to high levels of openness.

There is additional literature that exhibits relationships between openness and episodic memory. For example, in a sample of 55 Iranian participants who underwent Sepidar cognitive testing and a Persian version of the NEO five-factor inventory, researchers found that openness was positively and significantly associated with episodic memory (Karsazi, Rezapour, Kormi-Nouri, Mottaghi, Abdekhodaie & Hatami, 2021). This relationship was still present and significant when the authors controlled for years of education, sex, socioeconomic status, and age (Karsazi et al., 2021). The authors of this study mentioned a possible mechanism for openness to have such impact on episodic memory is because people that score high in areas of openness often have an intrinsic

desire to learn, be actively engaged, and have novel experiences (Karsazi et al., 2021). Due to these dynamic processes of learning and engagement over time in individuals who are highly open, it may act as a protective factor against cognitive decline in aging (Karsazi et al., 2021). In an additional study that actually also used MIDUS data, researchers report findings of openness being significantly associated with long term memory performance, like episodic memory (Stephan, Sutin, Luchetti, & Terracciano 2020). These authors contribute this protection openness provides to be due to the active and cognitively stimulating lifestyle openness over the life course may provide. Additionally, there is literature, as described in this study that show that higher openness is associated to lower inflammation which could contribute to the outcomes of better memory (Stephan et al., 2020). Lastly, a study that analyzed 40 older adult participants found that openness and executive control could predict the outcomes of a word recall test designed to assess episodic memory (Martinez, Fay, Onsekiz, Bouazzaoui & Taconnat, 2021). The authors attributed this to be because Openness is a reserve factor and is an essential component, along with executive control, in difficult memory tasks (Martinez et al., 2021).

Agreeableness

As previously mentioned, there have been studies to find agreeableness having an association with processing speed and reasoning skills (Chapman et al., 2012). This may be reason as to why there was a significant relationship between agreeableness and cognition in this particular sample of African American adults. A study amongst 58 healthy community-dwelling older adults found significant associations between self-reported agreeableness and executive function (Williams, Suchy, & Kraybill, 2010).

Agreeableness has been found to be associated with better performance in tasks where behavioral control is necessary and with stress regulation processes, which is helpful for long term cognitive health (Williams et al., 2010). An additional study in 16 to 18-year-old drivers found that younger drivers exhibited high risky driving behaviors, further those same younger drivers had poor executive function and had significantly low agreeableness scores (Starkey & Isler, 2016). This finding provides additional support that agreeableness and behavioral control are linked and exhibit the relationship that low executive function was associated with low agreeableness scores (Starkey & Isler, 2016).

When analyzing personality and cognition in 55 patients with Mild Cognitive Impairment and 84 healthy control older adults, researchers found one interesting finding, that there was a negative association between subjective cognitive decline and agreeableness, such that the higher someone scored in agreeableness, the lower their subjective cognitive decline (Studer, Donati, Popp & von Gunten, 2014). Additionally, in another study using data from the Health and Retirement Study, in a sample of 2,865 individuals who completed cognitive tasks relating to memory, executive function, fluency, and numeric reasoning, researchers discovered that openness and agreeableness were the only personality traits that were associated with better cognitive performance in all domains excluding numeric reasoning (Sutin et al., 2019).

Unfortunately, there is not a vast amount of literature finding significant relationships between agreeableness and cognition, but the findings in this thesis and in the aforementioned literature exhibit the need to take a more in-depth approach to assessing the mechanisms of agreeableness and how it may impact cognitive abilities and function.

Sociodemographic Controls

Age was the control variables that proved to have statistically significant impact on cognition as represented in the ANCOVA. Change in cognition is a normal part of aging and some areas in cognition may improve, but others like conceptual reasoning, memory, and processing speed will decrease over time even in a healthy brain (Harada et al., 2013). Seeing a significant influence in age in this sample is to be expected.

This thesis made a point to mention the various health deficits facing the African American community. That African Americans are twice as likely to die of heart disease, a high likelihood of high blood pressure, hypertension, and diabetes (CentraState Healthcare System, 2020). Thus, it is also important to mention that openness has also been linked to better health and a decreased overall mortality risk (Goodman & Friedman, 2007). The most common type of dementia to impact African Americans is vascular dementia, which intuitively is derived from those statistics of poor cardiovascular health within the community (Miles, Froehlich, Bogardus & Inouye, 2001). Due to openness being commonly linked to healthy lifestyles and daily activities, also things which would positively influence heart health, it is important to make this type of information available to majority African American communities. This would stress the importance of healthy living to ideally, positively impact both physical and cognitive health over the life course. The sample for this thesis is solely African American, and the results show that openness, which is indicative of those healthy lifestyles, had significant influence on cognition. One of those measures being episodic memory which, in individuals with vascular dementia, moderate to severe significant deficits in episodic memory has been shown (Graham, Emery, & Hodges, 2004).

Although there were findings of personality relating to cognition, it was interesting that no other relationships were found to be significant. For example, conscientiousness tends to be associated with self-control and self-discipline. Thus, studies have found relationships between conscientiousness and cognitive ability such that conscientiousness is positively associated with cognitive functioning because conscientiousness influences health behaviors that are protective against age-related changes in the brain (Sutin et al., 2011). The positive health behaviors associated with people with high conscientiousness is a likely an outcome from the self-control and self-discipline these individuals tend to exhibit, and those positive health behaviors are extremely beneficial to longevity and cognitive health/ function. A study was done that supports this notion with analyzing the relationship between conscientiousness and mild cognitive decline. These researchers focused on Mild Cognitive Impairment because it is believed to be a state that is likely to lead to dementia, often Alzheimer's disease (Wilson, Schneider, Arnold et al., 2007). This study found that high levels of conscientiousness is associated with reduced risk to cognitive impairment, and this significant association remained true after controlling for physical, cognitive, social activity, and cardiovascular health (Wilson et al., 2007). Additionally, this study reported findings that high levels of conscientiousness had significant association with reduced rates of decline in episodic, semantic, and working memory, as well as visuospatial ability (Wilson et al., 2007). There is one additional study that analyzed self-report measures of executive function and personality that found a correlation between executive function problems and low conscientiousness (Buchanan, 2016). This study used the following self-report measures; Trail Making test, Phonemic/ Semantic Fluency

test, and the Digit Span test, and on all three measures the correlation remained true with a medium to large effect size (Buchanan, 2016).

Additionally, there is immense research presenting that neuroticism may be a public health issue, even some studies showing that neuroticism causes unique brain atrophy. Traits of neuroticism have major public health implications, such that it has been linked to various psychopathological and physical health outcomes (Widiger & Oltmanns, 2017). Also, researching public health implications of neuroticism, it has been reported that neuroticism is substantially heritable, and that its heritability peaks in early adolescent to early adulthood years (Lahey, 2009). Neuroticism being a heritable personality trait and being an area of public health concern makes the study of neuroticism more important, especially in groups who already suffer from heritable public health issues. Additionally, in a paper assessing African Americans, the idea of stress is important in understanding the social stressors affecting the African American community because of things like social inequalities/ inequities, the national wealth gap, and discrimination. According to research, those with high levels of neuroticism are more prone to trait anxiety because of stress and arousal (Mohiyeddini et al., 2014). This can result in psychopathological effect because of two reasons: prolonged arousal over a life course may cause neuronal damage and anxiety, and stress can activate the hypothalamic-pituitary-adrenal axis (HPA) axis which release cortisol in response to stress which can impair cognitive performance (Mohiyeddini et al, 2014). There are various findings for both hypotheses as to why high neuroticism may cause poorer cognitive performance, but the theme of prolonged stress and anxiety being a key element is a considerable finding. Although this study did not find significant relationships between neuroticism and

cognitive outcomes, there is enough evidence in the literature to encourage study of this relationship in future research.

This study did present significant relationships between agreeableness and openness and cognition in some cases, but there were a number of cases that were not significant. Research in this area should continue to try and find more connections between personality and cognition in all groups. Minority groups are an important focus of this research because of how influential culture, biological bases, and external factors can be on personality. Many minorities pride themselves on their cultures and each of these cultures are heavily influenced by historical events, norms, practices, ideologies, and beliefs. This is what makes personality so interesting to study, it is multifaceted and unique amongst individuals, groups, and societies, thus should be assessed as such.

VI. LIMITATIONS

There are a few limitations this study faced. One would be the small sample size used for data analyses ($N=94$). This is a small sample size for such a large-scale question of finding personality influences on cognition, and there was quite the number of participants in this with missing data in various domains this thesis assessed that also contributed to the low sample size. This limitation arose because of the specificity of the research question in only attempting to answer this question in a solely African American sample. This study uses secondary data, and although this database did attempt to recruit a diverse population, there were still not a large number of African Americans involved. This dataset was unique in that it measured all of the five-factor personalities and various measures of cognition, and this is why the dataset was chosen. Additionally, it did an extensive cognitive battery, using many different cognitive tests measuring for both executive function and episodic memory. An additional limitation is that since this thesis did not do longitudinal research, the MIDUS calculated composite scores were not able to be used, although this thesis did develop its own composite scores using statistical processes. Further, additional limitation of this thesis that may have contributed to these results is a lack of sociodemographic and personality diversity within the population. Most of the African American in this sample had a high level of education, decent physical and mental health, and decent income, but this is very reflective of when and where this data was collected. It also attests to what individuals are involving themselves in research and which groups are not, A more sociodemographic diverse population may have exhibited more disperse results. Also, majority of individuals in this sample were highly open, agreeable, extraverted, and conscientious, and the only personality that was

completely inverted was neuroticism with 17 individuals scoring in the highly neurotic group.

This thesis did want to address cumulative inequality in an African American sample, and in the future a more longitudinal approach may be used to then be able to analyze the data in this dataset addressing childhood and parental history. Variables addressing socioeconomic status of parents, education of parents, childhood geographic location, parents' occupation, parents' marital status, and things of that nature would be helpful in establishing a cumulative impact of possible inequalities that may impact the presented question. This study, even with these areas of limitation did find some significant relationships, and in further research if these limitations are addressed, more significant results could possibly be produced.

VII. CONCLUSION

This thesis aimed to identify if personality significantly influenced cognition in African Americans. Based on the analyses conducted, it can be concluded that openness and agreeableness positively influenced cognition in an African American sample. The results suggest that openness and agreeableness may influence executive function and episodic memory. The results also show that age significantly influences cognition in select cases. Based on the findings of this study, there are personality influences on cognition in an African American sample and further research analyzing this relationship would be very helpful in this community. Specifically, openness and its relationship to a healthy lifestyle can act as a call to action to provide African American communities with facts and resources to healthier lifestyles and how it can lead to positive physical and cognitive outcomes. Dementias such as vascular dementia and Alzheimer's disease are highly prevalent in African Americans, and if traits of openness like activity engagement, cognitively stimulating daily activities, and a healthy lifestyle can influence cognitive function in later life, it is vital that this is heavily incorporated into the community. Researching personalities in African Americans on a larger scale would prove to be very helpful because there is little specific research in this area. This thesis revealed significant relationships, but there is much more to learn and explore, and the hope is this will ignite further research in finding more relationships and understanding the mechanisms involving them.

APPENDIX SECTION

Appendix A: MIDAS Personality Questionnaire

C7. How well does each of the following describe you?				
	A lot	Some	A little	Not at all
a. Outgoing	1	2	3	4
b. Helpful	1	2	3	4
c. Moody	1	2	3	4
d. Organized	1	2	3	4
e. Self-confident	1	2	3	4
f. Friendly	1	2	3	4
g. Warm	1	2	3	4
h. Worrying	1	2	3	4
i. Responsible	1	2	3	4
j. Forceful	1	2	3	4
k. Lively	1	2	3	4
l. Caring	1	2	3	4
m. Nervous	1	2	3	4
n. Creative	1	2	3	4
o. Assertive	1	2	3	4
p. Hardworking	1	2	3	4
q. Imaginative	1	2	3	4
r. Softhearted	1	2	3	4
s. Calm	1	2	3	4
t. Outspoken	1	2	3	4
u. Intelligent	1	2	3	4
v. Curious	1	2	3	4
w. Active	1	2	3	4
x. Careless	1	2	3	4
y. Broad-minded	1	2	3	4
z. Sympathetic	1	2	3	4
aa. Talkative	1	2	3	4

bb. Sophisticated	1	2	3	4
cc. Adventurous	1	2	3	4
dd. Dominant	1	2	3	4
ee. Thorough	1	2	3	4

(Midlife in the United States (MIDUS) Series (umich.edu))

Appendix B: Brief Test of Adult Cognition by Telephone

The BTACT consists of 6 primary subtests, presented in the following text in order of administration.

Word List Immediate Recall measures immediate recall of a 15-word list derived from the Rey Auditory Verbal Learning Test (RAVLT). The list is read aloud to participants, who then must immediately recall the words. The score represents the total number of words recalled correctly.

Digits Backward measures working memory with Digit Span Backward from the Wechsler Adult Intelligence Scale-III.¹⁴ A string of 2 to 8 numbers is read aloud and participants are asked to repeat the numbers in reverse order. The score ranges from 0 to 8, based on the longest set of digits correctly repeated backwards.

Category Fluency involves naming as many animals as possible in 60 seconds as a measure of executive functioning. The score is the total number of different animals named.

Number Series measures inductive reasoning by asking for a sixth number in a series of 5 presented numbers. Participants must identify the pattern in the sequence and apply that pattern to successfully determine the sixth number. The score ranges from 0 to 5 depending on the total number of sequences completed correctly.

Backward Counting, a measure of processing speed, requires participants to quickly generate a nonautomatic sequence of familiar items by counting backwards from 100 aloud as quickly and accurately as possible for a span of 30 seconds. The score is the total number of digits correctly produced.

Word List Delayed Recall, a measure of memory retrieval, involves recall of the RAVLT word list presented approximately 15 minutes earlier. The score ranges from 0 to 15, based on the total number of words recalled correctly.

Manual, M. I. C. T. B. Brief Test of Adult Cognition by Telephone (BTACT) with Stop & Go Switch Task (SGST) Margie E. Lachman, Project Leader Patricia A. Tun, Co-Investigator Brandeis University.

REFERENCES

- 7 common health concerns African Americans should monitor*. CentraState Healthcare System. (2020, February 27). Retrieved February 10, 2022, from <https://www.centrastate.com/blog/7-common-health-concerns-african-americans-should-monitor/>
- Aiken-Morgan, A. T., Bichsel, J., Allaire, J. C., Savla, J., Edwards, C. L., & Whitfield, K. E. (2012). Personality as a source of individual differences in cognition among older African Americans. *Journal of research in personality*, 46(5), 465-471.
- Baltes, B. B., & Dickson, M. W. (2001). Using life-span models in industrial-organizational psychology: The theory of selective optimization with compensation. *Applied Developmental Science*, 5(1), 51-62.
- Bogg, T., & Roberts, B. W. (2013). Duel or diversion? Conscientiousness and executive function in the prediction of health and longevity. *Annals of Behavioral Medicine*, 45(3), 400-401.
- Booth, J. E., Schinka, J. A., Brown, L. M., Mortimer, J. A., & Borenstein, A. R. (2006). Five-factor personality dimensions, mood states, and cognitive performance in older adults. *Journal of Clinical and Experimental Neuropsychology*, 28(5), 676-683.
- Brown, M. T. (2010). Early-life characteristics, psychiatric history, and cognition trajectories in later life. *The Gerontologist*, 50(5), 646-656.
- Buchanan, T. (2016). Self-report measures of executive function problems correlate with personality, not performance-based executive function measures, in nonclinical samples. *Psychological Assessment*, 28(4), 372.

- Chapman, B., Duberstein, P., Tindle, H. A., Sink, K. M., Robbins, J., Tancredi, D. J., & Franks, P. (2012). Personality predicts cognitive function over 7 years in older persons. *The American Journal of Geriatric Psychiatry*, 20, 612–621.
doi:10.1097/JGP.0b013e31822cc9cb
- Chapman, B. P., Fiscella, K., Duberstein, P., Coletta, M., & Kawachi, I. (2009). Can the influence of childhood socioeconomic status on men's and women's adult body mass be explained by adult socioeconomic status or personality? Findings from a national sample. *Health Psychology*, 28(4), 419.
- Cherry, K. (2019, October 14). *What Are the Big 5 Personality Traits?* *Verywell Mind*. Retrieved 12 June 2020, from <https://www.verywellmind.com/the-big-five-personality-dimensions-2795422>
- Cognitive effort*. Cognitive Effort - an overview | ScienceDirect Topics. (n.d.).
<https://www.sciencedirect.com/topics/computer-science/cognitive-effort#:~:text=Cognitive%20effort%20involves%20finding%20the,the%20results%20of%20the%20action>.
- Costa Jr, P. T., & McCrae, R. R. (1992a). Four ways five factors are basic. *Personality and Individual Differences*, 13, 653–665. doi:10.1016/0191-8869(92)90236-I
- Costa Jr, P. T., & McCrae, R. R. (1992b). Revised NEO personality inventory (NEOPI-R) and NEO Five-Factor Inventory (NEO-FFI) manual. Odessa, FL: Psychological Assessment Resources
- Crews, D. C., Pfaff, T., & Powe, N. R. (2013, September). Socioeconomic factors and racial disparities in kidney disease outcomes. In *Seminars in nephrology* (Vol. 33, No. 5, pp. 468-475). WB Saunders.

- Curtis, R. G., Windsor, T. D., & Soubelet, A. (2015). The relationship between Big-5 personality traits and cognitive ability in older adults—a review. *Aging, Neuropsychology, and Cognition*, 22(1), 42-71.
- D'Iorio, A., Garramone, F., Piscopo, F., Baiano, C., Raimo, S., & Santangelo, G. (2018). Meta-analysis of personality traits in Alzheimer's disease: a comparison with healthy subjects. *Journal of Alzheimer's Disease*, 62(2), 773-787.
- Duncan, G. J., & Magnuson, K. (2012). Socioeconomic status and cognitive functioning: moving from correlation to causation. *Wiley Interdisciplinary Reviews: Cognitive Science*, 3(3), 377-386.
- Ferraro, K. F., & Shippee, T. P. (2009). Aging and cumulative inequality: How does inequality get under the skin? *The Gerontologist*, 49(3), 333-343.
- Ferraro, K. F., Shippee, T. P., & Schafer, M. H. (2009). Cumulative inequality theory for research on aging and the life course. In V. L. Bengtson, D. Gans, N. M. Pulney, & M. Silverstein (Eds.), *Handbook of theories of aging* (pp. 413–433). Springer Publishing Company.
- Ferraro, K. F., Kemp, B. R., & Williams, M. M. (2017). Diverse aging and health inequality by race and ethnicity. *Innovation in aging*, 1(1).
- Friedman, H. S. (2019). Neuroticism and health as individuals age. *Personality Disorders: Theory, Research, and Treatment*, 10(1), 25.
- Gensowski, M., Gørtz, M., & Schurer, S. (2021). Inequality in personality over the life cycle. *Journal of Economic Behavior & Organization*, 184, 46-77.
- Gilbert, S. J., & Burgess, P. W. (2008). Executive function. *Current biology*, 18(3), R110-R114.

- Gonzales, E., Jung, L., Lee, Y., & Wang, Y. (2018). Cumulative Inequality: A Lens to Understand Structural Discrimination and its Effect on Health. *Innovation in Aging*, 2(suppl_1), 230-230.
- Graham, N. L., Emery, T., & Hodges, J. R. (2004). Distinctive cognitive profiles in Alzheimer's disease and subcortical vascular dementia. *Journal of Neurology, Neurosurgery & Psychiatry*, 75(1), 61-71.
- Grohol, J. M. (2019, May 30). *The Big Five Personality Traits*. PsychCentral. Retrieved 10 June 2020, from <https://psychcentral.com/lib/the-big-five-personality-traits>
- Hagger-Johnson, G., Roberts, B., Boniface, D., Sabia, S., Batty, G. D., Elbaz, A., et al. (2012). Neuroticism and cardiovascular disease mortality: socioeconomic status modifies the risk in women (UK Health and Lifestyle Survey). *Psychosomatic medicine*, 74(6), 596-603.
- Hall, P. A., & Fong, G. T. (2013). Conscientiousness versus executive function as predictors of health behaviors and health trajectories. *Annals of Behavioral Medicine*, 45(3), 398-399
- Harada, C. N., Natelson Love, M. C., & Triebel, K. L. (2013). Normal cognitive aging. *Clinics in geriatric medicine*, 29(4), 737-752.
<https://doi.org/10.1016/j.cger.2013.07.002>
- Hernandorena, I., Duron, E., Vidal, J. S., & Hanon, O. (2017). Treatment options and considerations for hypertensive patients to prevent dementia. *Expert opinion on pharmacotherapy*, 18(10), 989-1000.

- Hughes, B. T., Costello, C. K., Pearman, J., Razavi, P., Bedford-Petersen, C., Ludwig, R. M., & Srivastava, S. (2021). The Big Five Across Socioeconomic Status: Measurement Invariance, Relationships, and Age Trends. *Collabra: Psychology*, 7(1), 24431.
- Ihle, A., Zuber, S., Gouveia, E. R., Gouveia, B. R., Mella, N., Desrichard, O., et al. (2019). Cognitive reserve mediates the relation between openness to experience and smaller decline in executive functioning. *Dementia and geriatric cognitive disorders*, 48(1-2), 39-44.
- Jackson, J. J., Hill, P. L., Payne, B. R., Roberts, B. W., & Stine-Morrow, E. A. (2012). Can an old dog learn (and want to experience) new tricks? Cognitive training increases openness to experience in older adults. *Psychology and aging*, 27(2), 286.
- Jackson, M. I. (2015). Cumulative inequality in child health and academic achievement. *Journal of Health and Social Behavior*, 56(2), 262-280.
- James, S. A. (1994). John Henryism and the health of African Americans.
- John, O. P., & Srivastava, S. (1999). The Big-Five trait taxonomy: History, measurement, and theoretical perspectives. In L. A. Pervin & O. P. John (Eds.), *Handbook of personality: Theory and research* (Vol. 2, pp. 102–138). New York: Guilford Press.
- Kambon, K., & Bowen-Reid, T. (2009). Africentric theories of African American personality: Basic constructs and assessment.
- Karageorge, E. (2017). The unexplainable, growing black-white wage gap. *Monthly Lab. Rev.*, 140, 1.

- Karsazi, H., Rezapour, T., Kormi-Nouri, R., Mottaghi, A., Abdekhodaie, E., & Hatami, J. (2021). The moderating effect of neuroticism and openness in the relationship between age and memory: Implications for cognitive reserve. *Personality and Individual Differences, 176*, 110773.
- Krok-Schoen, J. L., & Baker, T. A. (2014). Race differences in personality and affect between older white and black patients: An exploratory study. *Journal of Racial and Ethnic Health Disparities, 1*(4), 283-290.
- Kuppens, P., Tuerlinckx, F., Yik, M., Koval, P., Coosemans, J., Zeng, K. J., & Russell, J. A. (2017). The relation between valence and arousal in subjective experience varies with personality and culture. *Journal of personality, 85*(4), 530-542.
- Lahey, B. B. (2009). Public health significance of neuroticism. *American Psychologist, 64*(4), 241.
- Lim, A. G. Y. (2020, June 15). *The big five personality traits*. Big Five Personality Traits | Simply Psychology. <https://www.simplypsychology.org/big-five-personality.html>.
- Lyu, J., & Burr, J. A. (2016). Socioeconomic status across the life course and cognitive function among older adults: An examination of the latency, pathways, and accumulation hypotheses. *Journal of Aging and Health, 28*(1), 40-67.
- Matthews, G., Deary, I. J., & Whiteman, M. C. (2003). *Personality traits*. Cambridge University Press.

- Martinez, L., Fay, S., Onsekiz, T., Bouazzaoui, B., & Taconnat, L. (2021). Episodic memory and aging: The role of cognitive reserve and cognitive resources according to task difficulty. *Gériatrie et Psychologie Neuropsychiatrie du Vieillissement*, 19(2), 219-228.
- M Tucker, A., & Stern, Y. (2011). Cognitive reserve in aging. *Current Alzheimer Research*, 8(4), 354-360.
- Maldonado, N. M., Sperandeo, R., Dell'Orco, S., Cozzolino, P., Fusco, M. L., Iorio, V. S., et al. (2017). The relationship between personality and neurocognition among the American elderly: an epidemiologic study. *Clinical practice and epidemiology in mental health: CP & EMH*, 13, 233.
- Maldonado, N. M., Sperandeo, R., Costa, V., Cioffi, V., Cozzolino, P., Santo, R. D., & Scognamiglio, C. (2017). Does Brain Sweat Pay Off? The Association between the Need for Cognition and Cognitive Function among the American Elderly. *J Psychol Psychother*, 7(326), 2161-0487.
- McCrae, R. R., & Costa, P. T., Jr. (2008). The five-factor theory of personality. In O. P. John, R. W. Robins, & L. A. Pervin (Eds.), *Handbook of personality: Theory and research* (pp. 159–181). The Guilford Press.
- Merton, R. K. 1988. The Matthew effect in science, II: Cumulative advantage and the symbolism of intellectual property. *ISIS*, 79,606-623.
- Miles, T. P., Froehlich, T. E., Bogardus Jr, S. T., & Inouye, S. K. (2001). Dementia and race: are there differences between African Americans and Caucasians? *Journal of the American Geriatrics Society*, 49(4), 477-484.

- Mitchelson, J. K., Wicher, E. W., LeBreton, J. M., & Craig, S. B. (2009). Gender and ethnicity differences on the Abridged Big Five Circumplex (AB5C) of personality traits: A differential item functioning analysis. *Educational and Psychological Measurement, 69*(4), 613-635.
- Mohiyeddini, C., Bauer, S., & Semple, S. (2015). Neuroticism and stress: The role of displacement behavior. *Anxiety, stress, & coping, 28*(4), 391-407.
- Neupert, S. D., Mroczek, D. K., & Spiro III, A. (2008). Neuroticism moderates the daily relation between stressors and memory failures. *Psychology and Aging, 23*(2), 287.
- Pause, B. M., Zlomuzica, A., Kinugawa, K., Mariani, J., Pietrowsky, R., & Dere, E. (2013). Perspectives on episodic-like and episodic memory. *Frontiers in Behavioral Neuroscience, 7*, 33.
- Radler B. T. (2014). The Midlife in the United States (MIDUS) Series: A National Longitudinal Study of Health and Well-being. Open health data, 2(1), e3.
<https://doi.org/10.5334/ohd.ai>
- Roberts, B. W., Kuncel, N. R., Shiner, R., Caspi, A., & Goldberg, L. R. (2007). The power of personality: The comparative validity of personality traits, socioeconomic status, and cognitive ability for predicting important life outcomes. *Perspectives on Psychological science, 2*(4), 313-345.
- Schulz, A., Israel, B., Williams, D., Parker, E., Becker, A., and James, S. (2000). Social inequalities, stressors and self-reported health status among African American and White women in the Detroit metropolitan area. *Soc. Sci. Med. 51*: 1639–1653.

- Shapiro, T., Meschede, T., & Osoro, S. (2013). The roots of the widening racial wealth gap: Explaining the black-white economic divide.
- Sharp, E. S., Reynolds, C. A., Pedersen, N. L., & Gatz, M. (2010). Cognitive engagement and cognitive aging: Is openness protective? *Psychology and aging*, 25(1), 60.
- Smith, J. P. (1998). Socioeconomic status and health. *The American Economic Review*, 88(2), 192-196.
- Soubelet, A., & Salthouse, T. A. (2010). The role of activity engagement in the relations between Openness/Intellect and cognition. *Personality and Individual Differences*, 49(8), 896-901.
- Staff, R. T., Hogan, M. J., & Whalley, L. J. (2017). Childhood intelligence and personality traits neuroticism and openness contributes to social mobility: A study in the Aberdeen 1936 Birth Cohort. *Personality and Individual Differences*, 114, 206-212.
- Starkey, N. J., & Isler, R. B. (2016). The role of executive function, personality and attitudes to risks in explaining self-reported driving behaviour in adolescent and adult male drivers. *Transportation research part F: traffic psychology and behaviour*, 38
- Stefan Fors, Carin Lennartsson, Olle Lundberg, Childhood Living Conditions, Socioeconomic Position in Adulthood, and Cognition in Later Life: Exploring the Associations, *The Journals of Gerontology: Series B*, Volume 64B, Issue 6, November 2009, Pages 750–757, <https://doi.org/10.1093/geronb/gbp029>

- Stephan, Y., Sutin, A. R., Luchetti, M., & Terracciano, A. (2020). Personality and memory performance over twenty years: Findings from three prospective studies. *Journal of psychosomatic research*, 128, 109885.
- Studer, J., Donati, A., Popp, J., & von Gunten, A. (2014). Subjective cognitive decline in patients with mild cognitive impairment and healthy older adults: Association with personality traits. *Geriatrics & Gerontology International*, 14(3), 589-595.
- Sutin, A. R., Stephan, Y., Luchetti, M., & Terracciano, A. (2019). Five-factor model personality traits and cognitive function in five domains in older adulthood. *BMC geriatrics*, 19(1), 1-10.
- Sutin, A. R., Terracciano, A., Kitner-Triolo, M. H., Uda, M., Schlessinger, D., & Zonderman, A. B. (2011). Personality traits prospectively predict verbal fluency in a lifespan sample. *Psychology and Aging*, 26, 994–999. doi:10.1037/a0024276
- Taylor, M. G., Min, S. N., & Reid, K. M. (2020). Cumulative Inequality at the End of Life?: Racial Disparities in Impairment in the Time Before Death. *The Journals of Gerontology: Series B*, 75(6), 1292-1301.
- Terracciano, A., Bilgel, M., Aschwanden, D., Luchetti, M., Stephan, Y., Moghekar, A. R., et al. (2022). Personality associations with amyloid and tau: Results from the Baltimore Longitudinal Study of Aging and meta-analysis. *Biological psychiatry*, 91(4), 359-369.
- Tulving, E. (1993). What is episodic memory? *Current directions in psychological science*, 2(3), 67-70.

- Turner, A. D., James, B. D., Capuano, A. W., Aggarwal, N. T., & Barnes, L. L. (2017). Perceived stress and cognitive decline in different cognitive domains in a cohort of older African Americans. *The American Journal of Geriatric Psychiatry*, 25(1), 25-34.
- Ueda, I., Kakeda, S., Watanabe, K., Sugimoto, K., Igata, N., Moriya, et al. (2018). Brain structural connectivity and neuroticism in healthy adults. *Scientific reports*, 8(1), 1-8.
- U.S. Census Bureau quickfacts: United States. (n.d.). Retrieved March 5, 2022, from <https://www.census.gov/quickfacts/fact/table/US/PST045221>
- Wallace, S. P. (2012). Social determinants of health inequities and healthcare in old age. *Public health for an aging society*, 99-118.
- Whitfield, K. E., Jonassaint, C., Brandon, D., Stanton, M., Sims, R., Bennett, G., et al. (2010). Does coping mediate the relationship between personality and cardiovascular health in African Americans? *Journal of the National Medical Association*, 102(2), 95-100.
- Widiger, T. A., & Oltmanns, J. R. (2017). Neuroticism is a fundamental domain of personality with enormous public health implications. *World Psychiatry*, 16(2), 144.
- Williams, M. T., Kanter, J. W., & Ching, T. H. (2018). Anxiety, stress, and trauma symptoms in African Americans: Negative affectivity does not explain the relationship between microaggressions and psychopathology. *Journal of racial and ethnic health disparities*, 5(5), 919-927.

- Williams, P. G., D O'Brien, C., & Colder, C. R. (2004). The effects of neuroticism and extraversion on self-assessed health and health-relevant cognition. *Personality and individual differences*, 37(1), 83-94.
- Williams, P. G., Suchy, Y., & Kraybill, M. L. (2010). Five-factor model personality traits and executive functioning among older adults. *Journal of Research in Personality*, 44(4), 485-491.
- Wilson, R. S., Krueger, K. R., Gu, L., Bienias, J. L., de Leon, C. F. M., & Evans, D. A. (2005). Neuroticism, extraversion, and mortality in a defined population of older persons. *Psychosomatic medicine*, 67(6), 841-845.
- Wilson, R. S., Schneider, J. A., Arnold, S. E., Bienias, J. L., & Bennett, D. A. (2007). Conscientiousness and the incidence of Alzheimer disease and mild cognitive impairment. *Archives of general psychiatry*, 64(10).