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Understanding the Predictive Value of Personality Traits and Executive Functioning in Emotional Intelligence

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Walden University
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Abstract

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by

Isa Wright

MA, Walden University, 2016

BS, University of Phoenix, 2014

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

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Abstract

The concept of Emotional Intelligence (EI) identifies numerous areas within life that are impacted by the development of higher EI, including school performance, work performance, parenting, relationship patterns, and more. The implications of EI appear to be far reaching, yet the understanding of how EI develops in an individual continues to be vague and unclear. The purpose of this quantitative study was to account for the roles that personality factors and executive functions play in EI. By incorporating personality trait theory and executive function theory, a survey was designed and disseminated online resulting in 89 completed surveys of participants between the age of 25 – 65 years. A multiple linear regression was run to understand the relationship between personality factors and executive function with EI. Results showed that emotional regulation, openness, extraversion, conscientiousness, neuroticism, agreeableness, self-management to time, organization/problem-solving, motivation, and self-restraint account for 32.4 % of the variance in EI with an adjusted R^2= of 23.9%. The model, as a whole, was able to significantly predict EI. Understanding the possible antecedents to the development of EI may help to support positive social change in various aspects of individual's lives, from school to work, by helping individuals increase problem-solving, decision-making, and attention skills that are core to EI. These factors are important and have been shown to positively impact productivity in school and work and may contribute to upward social mobility.

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Dedication

To my family who have continually shown me support and encouragement throughout my doctoral journey. To my husband, Tom, who picked up slack when I thought I had nothing left to give. You never gave up for me.

To my mother, Marybeth, whose continued love of knowledge has made my love for learning never end. You asking questions helped me more than you will ever know.

To my incredible boys, Dylan, and Kaleb, you are my inspiration. The unyielding love you have always given, even though the sacrifices I have asked in time and expectations, filled my cup when I needed it most. I hope you both find the passion to always reach for what you want in life.

To my friends, Jennifer, Chad, and Steve, who are truly family. The almost done has finally come to fruition and I could not have done it without all your love and encouragement.

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Chapter 1: Introduction to the Study

Introduction

Intelligence has captivated the realm of psychology for years, supporting the incredible advancements in the understanding of intelligence. In conjunction with these advancements has come a plethora of information regarding differences in cognition, perception, attention, emotions, and so forth. Emotional intelligence (EI) emerged within the literature to capture the wide array of individual differences within these constructs (Hughes et al., 2018). However, EI researchers quickly diversified their approach creating many substantively different definitions and measures. Diversification within the research has led to a lack of meaningful theoretical advancements and the commercialization of EI measures has further exacerbated the inconsistencies in terminology, measurement, and empirical findings (Locke, 2005; Zeidner et al., 2008).

In Chapter 1, I address the background related to the development of EI and the outcomes measured by EI. More specifically, the chapter identifies information on how EI impacts various aspects of life and how important it is to gain a better understanding of how EI may develop to support optimal development of EI with a particular focus on the factors of personality traits and executive function. Lastly, the nature of the study, assumptions of the study and limitations, scope, and delimitations will also be addressed.

Background

Antecedents of EI development are largely unexplored; however, there is evidence that temperament is a predictive factor in the development of EI (Petrides et al., 2016). Gardner et al. (2011) further suggest that temperament, and not environmental

factors, is more predictive of trait EI. However, Costa et al. (2018), indicate that parental interactions may be a strong predictor of adolescent EI. Similar results were found in a study conducted by Cindea (2015). The studies indicate there remains some lack of clarity within the literature on what leads to the development on EI.

Another antecedent and integrated aspect of EI is personality factors (Pertrides et al., 2016). However, the overlap between personality factors and EI factors requires enhanced understanding of the relationship (Hughes & Evans, 2018). Di Fabio and Saklofsmotike (2018) suggested that replication studies can examine the effectiveness of including both EI and personality factors in programs intended to enhance resiliency and within larger and other populations to confirm findings.

Further, Hughes and Evans (2018) explain a need to explore the relationship between emotional regulation, captured as executive functioning, and the factors of EI, indicating the definition of EI had become so broad that almost any intrapersonal, interpersonal, or emotional regulation behavior would classify within the meaning. Concerned with a lack of understanding within the literature regarding EI, they suggest ed the need for further exploration of antecedents to the development of EI.

Problem Statement

EI has been consistently identified as a predictor for various outcomes in physical and psychological health (Fernandez-Abascal & Martın-Dıaz, 2015), psychopathology (Davis & Humphrey, 2012; Mikolajczak et al., 2009), academic performance (Di Fabio & Saklofsmotike, 2018), and prosocial and antisocial behaviors (Gugliandolo et al., 2015; Petrides et al., 2006). Thus, EI plays a pivotal role in the different outcomes of health,

mental health, performance, and behaviors. The current understanding of the research supports the notion that EI is a fundamental part of success in different aspects of life. However, less is known about the antecedents to EI, suggesting further research is needed.

Emotions carry a distinctive influence on the processes needed to make meaningful decisions and problem solve. According to Hughes and Evans (2018), the relationship between emotions, intelligence, and emotional regulation needs to be better understood. There are discrepancies among the different models of EI that must be further researched to define what is and is not EI. Accordingly, they suggested that future researchers adopt a more specific approach measuring theoretically relevant abilities, personality traits (or facets), and regulation strategies (Hughes & Evans, 2018). The lack of clarity within the models of EI has led some to use caution surrounding such constructs, leading to the need for clear and concise definitions that may provide more precise boundaries for each related construct.

Purpose of the Study

The purpose of this quantitative study was to examine the relationship between personality factors and executive functioning when measuring the variance in EI. This study explored how each specific domain of personality, (extroversion, agreeableness, openness to experience, conscientiousness, and neuroticism) and the different components of executive function (self-management to time, self-organization/problem-solving, self-discipline/inhibition, self-motivation, concentration/attention, and self-activation/initiation) relate to the variance in EI. By doing this investigation, I provided

some needed clarity within the literature to bridge the gap within the emergent theories of EI. A more precise delineation between the intersections of cognitive ability, personality traits, and competency-based emotion regulation will better support the theory of EI as opposed to dividing these concepts into separate models.

Research Question and Hypotheses

In this study, the relationship between the big five personality traits and components of executive functioning were measured against levels of EI. This was done by measuring personality traits and executive functions of adults in correlation with their EI. The assumption is that personality traits and executive functions can predict EI.

Research Question 1: What is the relationship between the personality traits of openness, agreeableness, extroversion, conscientiousness, and neuroticism and the executive functions of self-management to time, self-organization/problem-solving, self-discipline/inhibition, self-motivation, concentration/attention, and self-activation/initiation to predict the total variance of EI?

$H_1$1: There is a relationship between personality traits and executive function in the variance of EI.

$H_0$1: There will be no relationship between personality traits and executive function in the variance of EI.

Trait Theory and the Theory of Executive Function

The theories used for this study are trait theory and the theory of executive function. Trait theory posits that each individual is derived of specific combination of traits that create their pattern of thinking, feeling, and behaving (DeYoung, 2015). The

integration of personality traits within EI is best understood through the exploration and understanding of the different theoretical constructs of personality. Specifically, trait theory seeks to assess the distinctive personality characteristics as a means of predicting how individuals will act in different situations.

Overall, traits will influence not only immediate behavior but the environmental experiences which impact development over the lifespan. Van der Linden (2017) found that traits may be switched on or off dependent upon a situation. Trait theory has been shown to have a relationship within the domain of EI, and a subsequent theory of Trait EI has emerged from these studies (Petrides, 2007). However, the relationship between personality traits and EI, although defined by Petrides (2007), contributes to the unclear delineation between the two constructs. Therefore, I felt that the inclusion of trait theory supports the understanding of the relationship between personality traits and EI, including whether personality traits predict EI development.

Executive functioning (EF) is a theoretical construct representing a domain of cognitive processes that regulate, control, and manage other cognitive functions (Barkley, 2012). Wade et al. (2018) found robust evidence from cross-sectionally and longitudinally derived sources that EF may have a directional relationship with components of theory of mind. More specifically, this directional relationship appears to impact aspects of how individuals can moderate their affect to understand those around them. Applying the theory of executive function within the study supported a clearer path towards understanding important variables which impact the development of EI.

Nature of the Study

The study used quantitative measures to elicit the potential relationships between these different variables. A multiple regression analysis was conducted to evaluate the prediction of personality traits and executive functions in the variance of EI. The dependent variable was the variance in EI, and the independent variables were the various personality traits (extroversion, agreeableness, openness to experience, conscientiousness, and neuroticism) and executive functions (self-management to time, self-organization/problem-solving, self-discipline/inhibition, self-motivation, concentration/attention, and self-activation/initiation).

Definitions

Agreeableness: personality trait that focuses on being cooperative, trustworthy, and good-natured, ranging from critical and uncooperative to helpful, trusting, and empathetic (Costa & McCrae, 1992).

Behavioral Inhibition: individuals inhibit prepotent responses or stop an ongoing response to control interference (Barkley, 1997).

Conscientiousness: personality trait may range from being impulsive, careless, and disorganized to hardworking, dependable, and organized, focusing mainly on competence, self-discipline, and thoughtfulness (Costa & McCrae, 1992).

Emotional Intelligence: a set of skills hypothesized to contribute to the accurate appraisal and expression of emotion in oneself and others, the effective regulation of emotion in self and others, and the use of feelings to motivate, plan, and achieve in one's life. (Mayer & Salovey, 1990)

Executive Function: self-directed actions needed to choose goals and to create, enact, and sustain actions toward those goals, or more simply as self-regulation (SR) to achieve goals (Barkley, 2012).

Extraversion: personality trait that focuses on emotional expression which may range from being quiet and reserved to outgoing and adventuresome (Costa & McCrae, 1992).

Internalization of Speech: the ability for an individual to develop reflective and moral reasoning based on rule-governed behaviors and to mentally shift one's behavior based on these cognitive understandings of metarules (Barkley, 1997).

Neuroticism: personality trait that focuses on the tendency toward unstable emotions, ranging from those who are calm and even-tempered to those who are anxious, unhappy, and prone to negative emotions (Costa & McCrae, 1992).

Openness: trait of openness may range from being practical and routine-oriented to curious and independent, focusing mainly on imagination, feelings, actions, and ideas (Costa & McCrae, 1992).

Personality Trait: traits that supports the idea of a person's unique patterns of thinking, feeling, and behaving (DeYoung, 2015).

Self-Management: monitoring the self for goal-directed persistence (Barkley, 1997).

Self-Regulation: focuses on emotional self-control to regulate motivation and arousal to achieve goal-directed behavior (Barkley, 1997).

Working Memory: allows individuals to attend to needed information to maintain a stream of thought (Barkley, 1997).

Assumptions

There are several assumptions regarding the study. First, I assumed the participants were honest when completing the self-assessment. Second, it is assumed the measures chosen were an accurate portrayal of the variables desired to be captured within the study. Also, I assumed that the participant who participated in the study provided a normally distributed sample of the general public thus providing a broad range of levels of EI, differing personality traits, and executive functioning to support the examination of the relationship between the variables.

Scope and Delimitations

The scope of the study included adults between the ages of 25- and 65-years-old. The target age range was decided based on developmental trajectories over a lifespan based on periods of cognitive growth. According to Berk (2010), early adulthood is a time when this growth begins to shift towards advanced experience-dependent growth around the ages of 25 – 40 years. This growth will eventually begin to flatten in late adulthood around the age of 65 years (Berk, 2010). The responses from the participants are expected to provide a better understanding of possible predictors of EI through the analysis of their level of EI, personality characteristics, and areas of possible dysfunction within their executive functions.

Limitations

There are anticipated limitations for the study. Although there is an assumption that participants provided an accurate and truthful portrayal of themselves when completing the self-report surveys, it cannot be guaranteed. Self-report bias is a limitation to the study based on the nature of the survey questions. Further, this study was limited by the convenience sampling strategy selected. The participants volunteered for this study; there was no way to ensure the sample represented the general public, and therefore the results may not be generalizable. Further, the limitation inherent within correlational studies leads to the inability to assume causation. This study does not indicate whether personality traits or executive functions cause changes in EI development.

Significance

More recently, there has been growing interest in how EI interacts with a person's ability to navigate their day-to-day experiences, from the role of EI in cognition to affect-related issues (Costa et al., 2018). EI is a relatively new concept in the field of psychology and deals mainly with the idea of identifying, managing, and showing empathy for the feelings of others (Salovey & Mayer, 1990). Different theoretical models of EI indicate aspects of emotional regulation and personality traits that may influence emotions but also impact motivation, impulse control, persistence, delayed gratification, adaptability, optimism, and hope (Salovey & Mayer, 1990).

Understanding the potential developmental origins of EI could provide essential suggestions on the promotion of an important protective factor for a wide range of

social/emotional outcomes. For example, EI was shown to be a protective factor for victims of school violence (Estevez et al., 2019). Moreover, those who were identified as the aggressors of school violence scored significantly lower in EI than their peers (Estévez et al., 2019). These results could lead to effective educational or preventive interventions designed to increase EI in adults, which may have implications on prosocial and antisocial behaviors, aggression, resiliency, violence in the home, and ultimately upward social mobility.

According to Salovey and Mayer (1990), EI is a set of skills that fosters a deeper understanding of self and others and increases one's capacity for problem-solving and cognition. EI can foster a greater sense of how an individual's own emotions can guide or derail themselves, and thus individuals can become better equipped to navigate the complexities of other relationships and their own resiliency (Di Fabio & Saklofsmotike, 2018). This study has added to the existing literature on the relationship between the variances of EI constructs, including personality traits and emotional regulation (identified through the executive functions). The understanding can support enhanced programming for a multitude of outcomes based on an individual's ability to effectively regulate emotions and attend to necessary stimuli in their environment.

Understanding the potential developmental origins of EI could provide essential suggestions on the promotion of an important protective factor for a wide range of affect-related outcomes, leading to potential important social changes. According to Mayer, Salovey, and Caruso (2008), different domains of EI influence emotions but also impact motivation, impulse control, persistence, delayed gratification, adaptability, optimism,

and hope. These factors all have important roles in supporting a person's success within society, whether it is within family, relationships, school, or work (Costa et al., 2018; Cindea, 2015; Di Fabio & Saklofsmotike, 2018; Estevez et al., 2019).

Summary

Since the emergence of EI in the literature, there has been increasingly more information suggesting the importance of EI within differing areas of life. Therefore, an essential area of study is also understanding what impacts EI. The recognition of factors that may contribute to the development of increased EI in individuals may have implications across aspects of work, school, relationships, and more. The purpose of this quantitative cross-sectional correlational study was to determine whether factors of personality traits and executive functioning predict levels of EI in adults. Chapter 2 will include the theoretical frameworks used to support the study and an in-depth analysis of the literature regarding personality traits, executive functions, and the known relationships between these components.

Chapter 2: Literature Review

Introduction

There are discrepancies among the different models of EI that must be further researched to define what is and is not EI. Accordingly, it is suggested that future researchers adopt a more specific approach measuring theoretically relevant abilities, personality traits (or facets), and regulation strategies (Hughes & Evans, 2018). The lack of clarity within the models of EI has led some to use caution surrounding such constructs, leading to the need for clear and concise definitions that may provide more precise boundaries for each related construct. Understanding the theoretical construct of EI involves a review of literature that will draw from past intelligence movements. This is mainly because the construct of EI is based on the notion that it represents a different type of intelligence (Mayer & Salovey, 1997). A further review of literature on concepts of personality traits and the domain of executive functioning will give more understanding of EI constructs.

This chapter includes a discussion of the search strategies used to review the literature of EI, personality traits, and executive functioning and the relationships between these constructs. Trait theory and the theory of executive functioning are used to examine the relationships. Further a brief overview of the history of intelligence theories will provide meaning to the development of EI.

Literature Search Strategy

The literature search strategy included an in-depth review of Walden University's library databases for peer-reviewed journals and seminal articles related to the topics of

EI, personality traits, and executive functioning. The keywords used during the literature search include *emotional intelligence, executive function, trait theory, self-regulation, personality traits,* and *personality trait theory*. The following is a list of Boolean operators used: *executive function* AND *emotional intelligence*, *emotional intelligence* AND *emotional regulation*, *personality traits* AND *emotional intelligence*. The search primarily consisted of sources published from 2016 to 2021, but the search also included critical articles and seminal literature dating as early as 1848. These databases were used in the search: Thoreau Multi, EBSCO, ProQuest Central, PsycTESTS, PsycINFO, and Google Scholar, resulting in 101 full-text, peer-reviewed articles used to complete the literature review. Further, there was an inclusion of articles obtained via reviewed articles by conducting forward searches on relevant articles.

Theoretical Foundation

The following theoretical frameworks support the consolidation of past research on intelligence, personality, and executive functions. This consolidation of theoretical perspectives should provide a conceptualization of how these different constructs are interrelated. Further, these frameworks will provide a rationale for the study.

Trait Theory

According to Stelmack and Stalikas (1991), the basic tenets of modern trait theory have a long history, whereas the more contemporary forms of trait theory stem from the work of three founding fathers, Gordon Allport, Raymond Cattell, and Hans Eysenck (Boyle et al., 2016). Allport defined a trait or disposition as a generalized neuropsychic structure which is peculiar to the individual with the capacity to render many stimuli

functionally equivalent and to initiate and guide consistent forms of adaptive stylistic behavior (Allport, 1937). Allport's idiographic approach to traits describes the filtering of experience through the characteristic dispositions or habits. For instance, a trait anxious person may experience the world as predominantly hostile (Boyles et al., 2016). The manner in which a person filters their experiences will have an impact on how they will perceive others' emotions and influence their own emotional affect.

Nomothetic trait models are primarily influenced by the work of Cattell (Cattell, 1973, 1978, 1980; Cattell & Kline, 1977). Cattell's research, and propensity towards quantitative measures, led him to develop his theory of human development that integrates cognition, personality, and temperament with environmental and cultural influences. His research culminated in his taxonomy of 16 different personality traits that can be used to describe and explain individual differences among people (Cattell, 1980, 1995).

The third influential psychologist among trait theories is Eysenck (Eysenck, 1947, 1957, 1967). Initially, Eysenck focused on two broad factors of personality – extraversion and neuroticism – and he later included psychoticism within his trait theory. Eysenck himself was a controversial researcher; however, his research on personality had a significant influence on psychology. Much of his research focused on the heritability of intelligence and personality. Eysenck attempted to ground traits in heritable properties of the brain through empirical studies (Boyles et al., 2016).

Interestingly, Eysenck's hypotheses regarding the biological bases of traits continue to be debated. Nevertheless, the research he provided to the field has shown the

importance of the brain and real-life outcomes in understanding personality traits (Matthews & Gilliland, 1999). Eysenck's research inspired others to consider how the three constructs of personality, executive function, and EI seemingly are intertwined through the lens of trait theory.

According to DeYoung (2015), trait theory provides a view of human personality mainly interested in the measurement of traits that supports the idea of a person's unique patterns of thinking, feeling, and behaving. Further, these patterns are considered relatively stable across the lifespan, indicating a biological underpinning to the traits (DeYoung, 2015). The integration of personality traits within EI is best understood through the exploration and understanding of the different theoretical constructs of personality. Specifically, trait theory seeks to assess the distinctive personality characteristics as a means of predicting how individuals will act in different situations.

These underlying assumptions of personality trait theories are illuminated through the work of different theorists, initially beginning with the work from Gordon Allport. Trait theorists have predominantly subscribed to several underlying assumptions and principles of traits (Mathews et al., 2003). One of the main assumptions is that traits are relatively stable across time, continuous, and dimensional. The stability of traits is found through psychometric measures that meet the criteria for reliability and validity, meaning when personality traits are measured through objective measures, the traits remain consistent across these domains of time and dimension. However, Boyles et al. (2016) stated that validity is problematic, leading to concerns with criterion validity, including error rates during performance and amplitudes of psychological responses.

Another central assumption of trait theory is the genetic basis of traits. The concept of personality has a genetic component that was initially considered a controversial topic. However, the research that has been conducted on personality has shown that there is a strong correlation between genetic influences and kinship personality traits (Boyles et al., 2016). The genetic relationship between the general factor of personality and trait EI indicates there is a substantial proportion of overlap between the two constructs, further suggesting there is a genetic component to personality including trait EI and general factors of personality (Van der Linden et al., 2018). Modern neuroscience models have also provided testable predictors of DNA linked to specific phenotypic personality traits. What previous research defines is a universality to traits, where they correspond to individual differences in brain functioning across cultures.

Further, traits have been found to have a general trait of expression and interaction across situations. In other words, traits are shown to have cross-situational consistency allowing different traits to support expression within different situations (Boyles et al., 2016). The general trait is referred to as a *general factor of personality* (Van der Linden et al., 2018). This assumption demonstrates the ability of a trait to affect behavioral outcomes across different situations. For example, extroversion is not only experienced during gatherings with others, but instead, it will impact the results across multiple situations. Further, Van der Linden (2018) found that traits may be switched on or off dependent upon a situation. Overall, traits will influence not only immediate behavior but the environmental experiences which impact development over the lifespan.

Trait theory has been shown to have a relationship within the domain of EI, and a subsequent theory of trait EI has emerged from these studies (Petrides, 2007). However, the relationship between personality traits and EI, although defined by Petrides (2007), contributes to the unclear delineation between the two constructs. Therefore, I felt that the inclusion of trait theory supported the understanding of the relationship between personality traits and EI, including whether personality traits may predict EI development.

Theory of Executive Function

EF is a theoretical construct representing a domain of cognitive processes that regulate, control, and manage other cognitive functions (Barkley, 2012). This constellation of cognitive abilities includes several abilities such as inhibition, working memory, cognitive flexibility, self-monitoring, and so forth. There is an increasing understanding of the physiological components of EF supported through neuroimaging studies (Chung et al., 2014). Many of these studies have suggested that the prefrontal and parietal regions are involved in EF (Wade et al., 2018).

Moreover, many researchers have been interested in understanding the relationship between EF and the different components of theory of mind or the aspects of how people understand others' thoughts and emotions, a hallmark of EI. According to Wade et al. (2018), EF may create limitations on a child's ability to effectively represent and reason about mental states during actual task performance. In their review of the literature, Wade et al. (2018) found robust evidence from cross-sectionally and longitudinally derived sources that EF may have a directional relationship with

components of theory of mind. More specifically, this directional relationship appears to impact aspects of how individuals can moderate their affect to understand those around them. Further, there seems to be a strong correlation between the physiological brain structures associated with EF and the theory of mind (Chung et al., 2014).

The theoretical framework of EF emerged within the literature in the 1970s and 1980s (Goldberg et al., 1989; Grafman, 1988; Morice, 1986; Pribram, 1973, 1976; Sandson & Albert, 1984; Stuss & Benson, 1987; Welsh & Pennington, 1988), when a link was found between frontal lobe functioning and executive functioning. Before this, the focus within the literature was on the prefrontal cortex (Harlow, 1848, 1868) and the frontal lobe functions, including will and temperament (Downey, 1923) or "synthetic ability" (Dyrud & Donnelly, 1969) among others.

Early definitions of EF consisted of a primary focus on the functions of the prefrontal lobes, thus intrinsically tying the EF with the functions of the prefrontal cortex (Barkley, 2012). While the relationship between EF and the prefrontal cortex are highly intertwined, the two are not interchangeable. According to Barkley (2012), the prefrontal cortex is not only home to EF but a variety of cortical connections, including the basal ganglia, amygdala, limbic system, and the cerebellum (Denckla, 1996; Nigg & Casey, 2005).

Barkley's self-regulatory model of EF (1997) is based on self-regulation and will provide the framework for looking at the relationship between EF and EI. Barkley drew from two previously developed theories on language and the prefrontal cortex to create a more comprehensive theory of EF. The self-regulatory model looks at EF through five

different components (1997). The primary component is behavioral inhibition where individuals inhibit prepotent responses or stop an ongoing response to control interference (1997). Another primary component of this model is working memory that allows individuals to attend to needed information to maintain a stream of thought (1997). Self-regulation of affect-motivation-arousal is another intermediate component of his model that focuses on emotional self-control to regulate motivation and arousal to achieve goal-directed behavior. Internalization of speech and reconstitution follow with the ability for an individual to develop reflective and moral reasoning based on rule-governed behaviors and to mentally shift one's behavior based on these cognitive understandings of metarules (1997). Overall, these components of EF govern motor control-fluency-syntax through the inhibition of task-irrelevant responses, the initiation of goal-directed behaviors, emotional control, ability to shift behavior based on response feedback and monitoring the self for goal-directed persistence (1997).

The theory of EF supports the conceptualization of a relationship with components of EI. However, it does not fully account for the intricacies within views of EI, and therefore additional theoretical frameworks are needed to guide the intended purpose of the study. The inclusion of trait theory enhances that understanding for the current study. However, this review will also provide a backdrop for the emergence of intelligence theories to offer a fully integrated theoretical framework for understanding the components of EI and why personality traits and EF are considered possible predictors.

Personality Traits

As part of this review, an evaluation of the relationship between personality traits and EI will be included. Further, an understanding of the relationship between personality traits and executive functions will enhance the knowledge of the triad: EI, personality traits, and EF. Personality trait models have undergone a similar trajectory of development as intelligence models.

Five-Factor Model

Costa and McCrae (1992), the developers of the five-factor model (FFM), identified five broad factors of personality. This model has become the most widely used and accepted model of personality today, often referred to as the 'big five.' According to Costa and McCrae (1992), the FFM describes each person as falling along a spectrum of the five different traits. Therefore, each person will have some extent of openness to experience, conscientiousness, extroversion, agreeableness, and neuroticism.

According to the FFM, the trait of openness may range from being practical and routine-oriented to curious and independent, focusing mainly on imagination, feelings, actions, and ideas. The trait of conscientiousness may range from being impulsive, careless, and disorganized to hardworking, dependable, and organized, focusing mainly on competence, self-discipline, and thoughtfulness. The trait of extroversion may range from being quiet and reserved to outgoing and adventuresome, focusing on emotional expression. The trait of agreeableness looks at being cooperative, trustworthy, and good-natured, ranging from critical and uncooperative to helpful, trusting, and empathetic. Lastly, the trait of neuroticism focuses on the tendency toward unstable emotions,

ranging from those who are calm and even-tempered to those who are anxious, unhappy, and prone to negative emotions.

The factors associated with the big five range between two extremes on the spectrum of personality traits, where individuals are identified on a continuum between the two extremes rather than at polar ends. Interestingly, the big five personality traits, among other personality traits, have shown to be relatively stable across the lifespan (McCrae & Costa, 1997). However, some traits may shift slightly as a person ages. For example, Donnellan and Lucas (2008) found that conscientiousness tends to increase through young adulthood into middle age, as seen in the increased ability to manage personal relationships and careers. Further, agreeableness has also been shown to increase with age (Terrancciano, McCrae, Brant, & Costa, 2005). Additionally, the big five personality traits have been shown to exist across ethnicities, cultures, and ages, and may have substantial biological and genetic components (Jang et al., 1996; McCrae & Costa, 1997; Schmitt et al., 2007).

Personality and Emotional Intelligence

There is a broad spectrum of research surrounding the relationship between EI and personality factors. The studies conducted are attempts to understand whether trait EI – a perspective on EI pioneered by Petrides and colleagues (Pertrides & Furnham, 2001) – is linked with the FFM of personality or a construct of its own (Hughes et al., 2018). Much of this research suggests there is a significant correlation between personality factors and emotional constructs. The most recent definition of trait EI developed by Petrides and colleagues states it is a "constellation of emotional self-perceptions located

at the lower levels of personality hierarchies" (Petrides, 2010, p. 137). Although there is a large body of evidence to demonstrate the differences between trait EI and ability EI (Van Rooy et al., 2005), there is continued disagreement on what extent trait EI falls within an existing personality model or whether it captures a new factor of personality (Hughes et al., 2018).

Personality typically refers to the relatively stable factors which are associated with a person's pattern of thinking, feeling, and behaving over a lifespan (Hughes & Batey, 2017). The resemblance of trait EI with personality constructs includes factors such as empathy and tendermindedness, impulsiveness, assertiveness, self-esteem, and competence, or self-motivation and achievement striving (Hughes & Evans, 2018). These constructs closely resemble the constructs within the FFM. Although trait EI did not initially set out to identify the self-perceived abilities of a personality, it has integrated these concepts into the model. It is essential to refine trait EI further to integrate personality factors more exclusively (Hughes & Evans, 2018).

Research from numerous fields demonstrates that personality traits do have an association with the perception (detecting an emotion) and valuation (determining whether an emotion warrants regulation) steps within the identification of emotional states (Carver & Connor-Smith, 2010; Schindler & Querengässer, 2019). According to the FFM, several traits, openness, conscientiousness, and extroversion, are also strongly associated with detection and regulation of emotional states. Further, there is evidence from a handful of empirical studies that demonstrate that personality traits may predict how people want to feel or make others feel (Eldesouky & English, 2018; Ford & Tamir,

2014). It is evident that there is a relationship between personality and EI, but the clarity of these interactions remains muddled in the plethora of research on the two topics.

The lack of clarity within these interactions can be seen in multiple studies. For instance, studies conducted to develop insights into the relationship between personality traits and EI have focused on numerous outcomes and etiologies (Krajniak et al., 2018; Sordia et al., 2019; Urquijo et al., 2019). Trait EI has been associated with numerous outcome-based results in life from school to work. In one study conducted by Sordia et al. (2019) emotional creativity was shown to moderate potential and achievement, thus enhancing interpersonal and intrapersonal skills. Similarly, Urquijo et al. (2019) discovered that EI is associated with variances in latent personality traits and work satisfaction. These findings suggest the aspects leading to higher EI are correlated with personality traits, such as been identified by Petrides and colleagues, but also increase skills that lead to higher life satisfaction.

In contrast, Krajniak et al. (2018) addressed the relationship between college adjustment and mental health-related concerns, anticipating there would be a relationship between personality disordered symptomology and EI. Whereas the correlation between higher EI and personality traits seems to lead to higher life satisfaction, deficits in EI appear to have an association with disordered personality characteristics and symptoms (Krajniak et al., 2018). These are important findings for the current study as they indicate the notion that EI is predictive of specific outcomes above and beyond the predictive value of personality traits alone. Their findings support the relationship of personality traits contributing to the prediction of EI, rather than the two constructs working

separately. These findings further suggest that there may be an alternative model between EI and personality trait factors.

Pérez-González and Sánchez-Ruiz (2014) published a study in which they found that trait EI can be considered a broad personality trait integrated into the higher levels of a multi-level personality hierarchy. Whereas Petrides et al. (2007) attempted to incorporate trait EI within the lower levels of personality factors. They also concluded that this construct could be considered a proxy for the general factor of personality (Pérez-González & Sánchez-Ruiz, 2014). However, in a later study conducted by Alegre et al. (2019), where they attempted to replicate the research done by Pérez-González and Sánchez-Ruiz (2014), found that trait EI showed convergent validity with personality but not discriminant validity. These findings suggest that trait EI is not integrated into the higher level of personality hierarchies yet does demonstrate another way to measure the same big five personality traits of personality (Alegre et al., 2019). Further, the findings suggest a strong correlation with the general personality factor, except for neuroticism (Alegre et al., 2019). Overall, these studies demonstrate there is a correlation between EI and personality traits and therefore it is important to continue to study what the relationship truly is between these two constructs.

History of Intelligence Theories

The desire to understand intelligence or the capacity for the mind to remember and learn is rooted in history. However, it was psychology that provided the forum in which to study intelligence (Gottfredson & Saklofske, 2009). From the theories of intelligence came the understanding of EI. The following is a brief overview of the

theoretical foundations for intelligence which will provide a backdrop for understanding how the theory of EI was developed.

Psychometric Movements Role in Theories of Intelligence

Psychometric theories of intelligence generally emerged to understand the structures of intelligence. Theorists who desired to connect theoretical attributes of introspection to observable phenomena developed assessment tools, measurement instruments, and formalized models. Theorists (Binet,1905; Cattell, 1963; Galton, 1865; Spearman, 1904; Thurstone, 1938) within the psychometrics movement established their work based on different factors of abilities that we can be measured (Gottfredson & Saklofske, 2009). It is the concept of abilities that intelligence theories have developed conceptual frameworks, either identifying one central ability or focusing on multiple types of abilities that make up general intelligence.

The theorists who developed the theories on intelligence understood there is a relationship between abilities and intelligence. Galton, for example, believed that the individual's innate predispositions of heredity are correlated with innate abilities of intelligence (Bulmer, 2003). Galton, and other theorist, continued to mold and translate the construct many times in the years to come as theories of intelligence emerged.

For instance, Spearman branched from the concept that intelligence is composed of general mental ability and developed a quantitative method of analysis to identify common factors among different ability measures, referred to as factor analysis (Spearman, 1904). Factor analysis provided an avenue to measure the relationships between various cognitive abilities and overall general intelligence. Binet (1905) defined

intelligence through the perceptions of individual and through their higher-level processes which operate on these perceptions. Further, Binet began to recognize the relationship between intelligence and emotion on the integrative factors of personality, a theory that was never developed before he died (Varon, 1936). Thurstone (1938), instead, suggests that there are seven different factors of intelligence, each that can be measured and described separately.

Models of Intelligence

There are many different models of intelligence. However, there are several in particular that support the relationship between intelligence and emotion. The evolution of varying intelligence theories helps understand how our "emotional mind will harness the rational mind to its purposes" (Srivastava, 2013, p. 97) based on emotional memory developed through processes such as interpretive bias (Becker & Leinenger, 2011).

Howard Gardner (1983) developed the theory of multiple intelligences, where intelligence is comprised of numerous independent abilities. Similar to Thurstone's model of primary abilities, Gardner developed eight distinct bits of intelligence that are different from one another. Whereas the model of primary abilities and other models of intelligence combined skills to create constructs of intelligence, the theory of multiple intelligences posits each construct of intelligence is separate and will function separately or in conjunction to produce intelligence (Sternberg & Sternberg, 2012).

The concepts of interpersonal and intrapersonal intelligence spoke to the awareness of feelings within intelligence (Mayer, Salovey, Caruso, Cherkasskiy, 2011). These constructs of intelligence point to the differences in how people use intelligence by

different people. More specifically, these two abilities of intelligence define a person's ability to understand the perceptions of others and the capability to control and understand oneself (Srivastava, 2013).

Sternberg took the concept of different abilities and developed the triarchic theory of human intelligence, where intelligence is comprised of three aspects that work together: creative, analytical, and practical (Sternberg, 1985a). The triarchic theory of intelligence emphasizes the role of metacognition (creative ability) to plan, monitor, and evaluate the self for problem-solving, considered higher-order executive processes (Sternberg & Sternberg, 2012). Cacioppo and Gardner (1999) relate the relationship that emotion plays within higher mental processes and behavior, as seen in the case of Elliot when trauma impacted his emotional reactivity but not cognition and his ability to plan and make decisions.

Dewey and Lull first used the theory of social intelligence. However, Thorndike expanded on the construct by identifying three divisions of ability based on a person's understanding and management of ideas (abstract intelligence), the mechanical intelligence based on concrete knowledge, and social intelligence based on people (Kihlstrom & Cantor, 2011). More precisely, Thorndike defined social intelligence as a person's ability to manage and understand other people and act accordingly in their relationships (Srivastava, 2013). The evolution of intelligence theories provides a glimpse at how emotions began to play an integral part of how individual abilities were thought to impact intelligence and vice versa. Not only were emotions integrated into the theories of intelligence but also personality.

Emotional Intelligence

The conceptualization of intelligence as multiple abilities that offers an opportunity for abstract thinking provides a framework for the prediction of certain types of success. Nevertheless, it seemingly continues to leave room for error in the prediction of specific behaviors (Kanesan & Fauzan, 2019). Lending to the search for alternative abilities in intelligence that might account for these variances in success and outcomes.

A comprehensive approach of EI initially appeared in the literature about 20 years ago, with some preliminary attempts at demonstrating that EI could be measured (Mayer et al., 2011). A review of the three different models of EI indicates the construct has emerged through the work of Salovey and Mayer, Bar-on, Goleman, and Petrides. These models have expanded their conceptualization of EI as researchers have continued to analyze the strengths and weaknesses within each model.

Mayer and Salovey's Mental Ability Model of Emotional Intelligence

Mayer and Salovey's mental ability model of EI is generally synonymous with that of general cognitive abilities, in that individuals have different skills related to their capacity to recognize, comprehend, and manage emotions (Mayer et al., 2011). The meta-experience of monitoring, evaluating, and acting to change one's mood was initially termed EI by Mayer et al. (1991) in a study of a multidomain model of mood, breaking mood down into emotion and emotion-management. However, understanding the concept of EI depends on an exploration of these two terms to establish a new type of intelligence.

Establishing a New Intelligence

Mayer and Salovey (1995) recognized that to establish a new intelligence, a correlation needs to be developed with already existing types of intelligence, but not so great of an association to imply the same intelligence. Similarly, Bernet (1996) was working to further refine the meaning of EI through an analysis of the awareness of emotions and ability to regulate emotional and behavioral responses. Interestingly, the analysis of emotional awareness and regulation supported both social intelligence and cognitive intelligence.

Taking a more in-depth look at emotions reveals that they appear to have evolved across mammalian species as a mechanism to alert and orient the individual to changes in relationships in the environment (Mayer et al., 2011). Further, cognition, another aspect of mental operations, allows individuals to learn from the environment and to solve problems in novel situations (Mayer et al., 2011). To establish EI as a new intelligence requires the evaluation of the intersection of these two mental operations.

Drawing from past theories of intelligence provides an opening for this intersection of emotion and cognition to merge. Gardner (1997) notes that intelligence is used differently by different people. A concept represented by Terman (1921) in the mental ability model, which characterizes intelligence based on the ability for abstract thinking. Furthermore, later, Wechsler (1940) recognized that individuals with similar IQ can differ significantly in their ability to reason and cope with their environments. Within this vein of thought, Mayer and Salovey (1991) developed a conceptual framework where emotion and cognition simultaneously promote intelligence by directing attention and

conducting cognitive processes to prioritize – in a sense, emotion acted as a source of organization in executive functioning.

The Emergence of a Definition

As the initial work continued to progress on the multi-domain aspects of mood, appraisal, and cognition (Mayer et al.,1991), Mayer and Salovey later connected cognition and affect to define EI. The definition that came after years of research described the ability for individuals to monitor their own and others' feelings while discerning between them to guide their attention and thinking (Mayer & Salovey, 1995). However, Mayer and Salovey (1997) recognized that this definition was limiting the intersection of emotion and cognition, the essence of what defined EI as intelligence. To correct the lack of inclusion of the higher-order processes of cognition into the definition, Mayer and Salovey (1997) make the following revision:

> Emotional intelligence involves the ability to perceive accurately, appraise, and express emotion; the ability to access or generate feelings when they facilitate thought; the ability to understand emotion and emotional knowledge; and the ability to regulate emotions to promote emotional and intellectual growth. (p. 10).

The Four-Branch Model

Mayer and Salovey's (1997) final definition of EI brought forth the current model of EI and a new model of intelligence emerged based on four branches of psychological processes ranging from basic to higher-order and more psychologically integrated processes. The lowest branch within the model concerns the perception, appraisal, and expression of emotions. The evolution of this process can be witnessed within the

development of infants and young children learning to identify their feelings and affective states, up through an adult's ability to identify these emotional states in self and others (Mayer & Salovey, 1995).

The second branch within the model concerns emotion's facilitation of thinking (Mayer & Salovey, 1997). In other words, it describes the processes by which emotional responses to events can assist in intellectual processing. Again, the evolution of this process is witnessed within the alerting response directed through emotions – the baby cries when hungry or smiles in response to pleasure. These emotional responses mature as an individual age to improve thinking and instead direct attention to significant changes (Mayer & Salovey, 1995). Emotion regulation theories, such as the self-regulatory model of executive function and emotional appraisal theory, further enhance this concept by stating that emotional reactions occur based on the perception the individual has of events (Barkley, 1997; Roseman & Evdokas, 2004; Siemer, Mauss, & Gross, 2007).

The third branch of the model addresses the ability to understand and analyzing emotions and employing emotional knowledge (Mayer & Salovey, 1997). Once a child can recognize emotions, they will begin to differentiate between the different emotions, developing a sense of emotion on a continuum. Further, people start to recognize that emotions relate to relationships and situations in that emotions originate from the perception of relationships and events that take place – anger stems from a sense of injustice or sadness that arises from loss (Mayer & Salovey, 1995). As EI develops, these notions of emotions with relationships and situations will become more complex.

Recognizing that emotions can be binary (to love and hate within the same connection) and that emotions can impact decisions and interpersonal relationships, the feeling of being unloved may prevent that person from allowing love from fear of rejection (Mayer et al., 2011).

The fourth branch, and highest level, emphasizes the conscious regulation of emotions to enhance emotional and intellectual growth (Mayer & Salovey, 1997). As people mature, they learn to separate the emotion from the behavior, learning to engage and disengage from emotion at appropriate times. The development of emotion regulation provides the opportunity for the conscious appraisal of situations and the implementation of reasoning through emotional insight (Carstensen & Mikels, 2005). Meaning, individuals gain the ability to understand how emotions are impacting behavior and subsequently disengage when needed. Further, they can apply reasoning strategies based on the understanding of the situation and emotional response. Mayer and Salovey describe this process as meta-experience. In which individuals engage in reflective practices of emotional reactions ("I do not fully understand the way I am feeling" or "These feelings are influencing how I am thinking"), as opposed to simple perceptions of emotions.

Goleman's Mixed Model of Emotional Intelligence

Moving beyond the concept of EI developed by Mayer and Salovey, Goleman (1995) developed a framework that included several personality qualities that focus on the inclusion of motivation. Within his context of EI, Goleman identifies knowing one's emotions, managing emotions, motivating oneself, recognizing emotions in others, and

handling relationships (Goleman, 1995). Each area is further broken down, and in particular, motivation includes attributes such as marshaling emotions, delaying gratification, and entering flow states (Goleman, 1995). Goleman's definition of EI became so broad that almost any intrapersonal or interpersonal behavior would classify within the definition (Hughes & Evans, 2018).

It was Goleman's definition of EI that hit the mainstream media when his book *Emotional intelligence: Why it can matter more than IQ* was published. However, this book was meant for generalized purposes and lacked the academic rigor needed to substantiate the current models of EI at the time (Hughes & Evans, 2018; Mayer et al., 2011). The publication of the book opened the door for rapid and piecemeal development of EI measures and inconsistencies in terminology, measurement, and empirical findings (Hughes & Evans, 2018).

Bar-On's Emotional Quotient Inventory

Bar-On developed another approach to EI with a definition as "an array of non-cognitive capabilities, competencies, and skills that influence one's ability to succeed in coping with environmental demands and pressures" (Bar-On, 1997, p. 14). This mixed-method approach to EI was based on five components that included intrapersonal EI, interpersonal EI, stress management, adaptability, and general mood (Bar-On, 1997). The premise of this model of EI was to identify why some individuals are better able to succeed than others (Mayer et al., 2011). These five components are further broken down into fifteen subcomponents: self-regard, emotional self-awareness, assertiveness, independence and self-actualization (Intrapersonal EI); empathy, social responsibility,

and interpersonal relationship (Interpersonal EI); stress tolerance and impulse control (Stress Management); reality testing, flexibility, and problem-solving (Adaptability); and optimism and happiness (General Mood).

Both Goleman and Bar-on's definitions of EI focus on a competency-based ability, which includes motivation, empathy, social skills, happiness, and achievement – orientation (Goleman, 1995; Bar-On, 1997). In many ways, the broad definitions of these mixed models can be encompassed within theories of emotion regulation (Gross, 1998), where concepts of emotional regulation facilitate goal -attainment (Gross, 2015).

Petrides Model of Trait Emotional Intelligence

Petrides and Furnham (2001) used regression analysis measures to identify a unique space within the Five-Factor model of personality for EI. By using confirmatory factor analysis, Petrides and Furnham (2001) were able to validate that emotional intelligence constructs can be isolated within the FFM, indicating that there is a relationship between EI and personality factors. These findings established the model of trait emotional intelligence, a distinct composite of hierarchal trait structures with emotional intelligence.

Petrides and Furnham (2003) define emotional intelligence as a constellation of emotion-related self-perceptions and dispositions, assessed through self-report. The precise composition varies across different conceptualizations, with some models being broader than others. The abilities identified within trait EI include adaptability, assertiveness, emotional appraisal of self and others, emotion express, emotion management, emotion regulation, impulsiveness, relationship skills, self-esteem, self-

motivation, social competence, stress, management, trait empathy, trait happiness, and trait optimism (Petrides & Furnham, 2001). According to Hughes and Evans (2018), there is a large body of evidence that suggests that trait EI does not correlate with ability EI. Thus, surmising that the two models are distinct perspectives, with ability EI linked to differences in intelligence and trait EI linked more to differences in personality.

Executive Functioning

The different functions of EF develop over the lifespan providing an overarching system that allows learning and social interactions (Barkley, 2012). It improves drastically within the first several years of life and continues to develop through adolescents and into adulthood. The skills provide the framework for successful interactions and learning needed to engage in civil society. There are differences in the domains that are associated with EF. However, the typical set of functions considered within the current research reflects on working memory, mental flexibility, and self-control.

According to Suchy (2015), the construct of EF is broken down into five subdomains, which include the executive cognitive functions (dysexecutive syndrome), meta-tasking (disorganized syndrome), response selection (disinhibition syndrome), initiation/maintenance (apathetic syndrome), and social cognition (inappropriate syndrome). Further, Brown's Model of EF (Brown, 2017) includes activation (organizing, prioritizing, and activating to work), focus (focusing, sustaining attention, and shifting focus to the task), effort (regulating alertness, sustaining effort, and processing speed), emotion (managing frustration and modulating emotions), memory

(utilizing working memory and accessing recall), and action (monitoring and self-regulating actions). These EF support an individual's ability to remember and follow instructions, adjust to new rules, develop skills and teamwork, leadership, critical thinking adaptability, and emotional awareness.

One aspect of EF is emotional regulation, which refers to the ability to modulate how one feels. Emotional regulation is captured in Barkley's self-regulatory model of EF and has similar correlations with components of EI. Within the model of EI the ability for a person to regulate their emotions to enhance their cognitive functions became an integral aspect of the definition (Mayer & Salovey, 1997). The inclusion of emotional regulation in EF, a cognitive processes model, supports the notion that cognition and emotion are intertwined (Suchy, 2016). Forms of empirical research support this notion of EF supporting top-down regulation, most notably being emotional regulation that emerges in conjunction with EF (Carlson & Wang, 2007; Liebermann, Giebrecht, & Maller, 2007). Similarly, Barkley (2012) defines EF through the lens of self-regulation – stating "those self-directed actions needed to choose goals and to create, enact, and sustain actions toward those goals, or more simply as self-regulation (SR) to achieve goals: EF = SR" (p. 60).

Others have made similar distinctions in EF, including Pruessner et al. (2020) and Gross & Cassidy (2019), who found self-regulation to be among the most characteristic feature of EF. The notion of EF as a function of self-regulation has provided grounding for research on working memory and attention within the domain of EF. The idea of emotional regulation, or the modulation of feelings, has been found in different measures

of performance related to EF (Andreotti et al., 2013; Compas et al., 2014; Schweizer et al., 2020). Moreover, these patterns are witnessed in poor regulation and relative weaknesses in EF as well (Schweizer et al., 2020). However, the understanding of how these processes work in conjunction is not as well understood, resulting in a lack of coherent literature.

Executive Functioning and Emotional Intelligence

According to Hughes and Evans (2018), studying personality traits can improve our understanding of how and why individual differences in emotion regulation arise. They go on to state our most prominent call for future research is to continue the integration using theoretical frameworks, such as the extended process model (Gross, 2015) and the IMAID (Hughes & Evans, 2018). These theoretical frameworks pull together the constructs of personality, emotional regulation as an EF, and EI.

Research has predominantly studied personality-driven differences in how people regulate (i.e., regulation strategies) with less known about personality-driven differences in why people regulate (Gross & Cassidy, 2019; Pruessner et al., 2020). What research there is (e.g., Eldesouky & English, 2018) suggests that further work will prove fruitful in helping to explain individual differences in emotion regulation. Research has predominantly examined personality concerning a limited range of emotional regulation strategies (e.g., avoidance, reappraisal, suppression) and completely neglected relations between personality and implementation tactics.

Different behavioral patterns emerge in the cognitive processes that allow mental flexibility when adapting to different emotional contexts. The use of emotional regulation

in cognitive processes has been associated with other EFs of inhibition, working memory, and shifting (Pruessner et al., 2020). Further, the relationship between this different EF (working memory, inhibition, shifting, and emotional regulation) has shown that working memory has an association with negative affect reduction and aspects of emotional behavior and regulation (Hendricks & Buchanan, 2016). This may suggest that there is a role of EF within the construct of EI.

There are studies aimed at understanding the relationship between these constructs over a lifespan, recognizing many behavioral patterns are part of a natural human phenotype (Pinker, 2002). In more recent years, there has been a growing interest in the antecedents of emotional regulation and cognitive processes. Without theoretical frameworks in place to organize these findings, there is little integration of the results. However, Gross and Cassidy (2019) examined how and why children engage in a strategy of emotional regulation referred to as expressive suppression through the lens of the process model of emotional regulation. Moreover, Hantke et al. (2017) found that more mediocre performance of EFs (explicitly working memory and attention) was associated with weaker ability to adapt to different emotional states (specifically conflict). Thus, demonstrating there is a known relationship between EF and constructs related to EI over the lifespan.

In consideration of EI constructs, which emphasize the perception and regulation of one’s emotional affect and others within different dynamic contexts, it is reasonable to begin to integrate EF within the theoretical framework of EI. It is unclear whether the consolidation of EI competencies and EF competencies will, in turn, lead to a deeper

understanding of EI constructs or if these theoretical constructs will instead fall into theories developed on emotional regulation. It is the goal of this research to help build the bridge between the different concepts and subsequently deepen the understanding of EI.

Summary

Aspects of EI stem from a long history of intelligence theories which purport that individuals have multiple factors contributing their intelligence. These notions led Mayer and Salovey to develop an emergent theory of intelligence which combined emotional amplitudes with cognitive processes. EI suggests that intelligence is comprised of multiple abilities and that the inclusion of emotional control and higher-order levels of awareness factors into intelligence (Mayer & Salovey, 1997). There is a further understanding of the relationship between personality traits, which have long been considered factors that contribute to interpersonal and intrapersonal skills that have some impact on EI. In conjunction, there are indicators within the research that EF also has some interaction within the cognitive processes that have been associated with the theory of EI. Next, Chapter 3 will focus on the research design and rationale to examine the relationship between these constructs: EI, personality traits, and EF.

Chapter 3: Research Method

Introduction

The purpose of this quantitative study was to examine the relationship between personality factors and executive functioning when measuring the variance in EI. In this chapter an introduction to and rationale for the research design will be provided. Further, the methodology, population, sampling and sampling procedures, recruitment and participation, and data collection methods are described. In addition, the instrumentation that was used to measure the desired variables are described and operationalized. A detailed data analysis plan is provided with threats to internal and external validity. Lastly, ethical considerations are described.

Research Design and Rationale

This study was a quantitative, cross-sectional research design that contributes to the knowledge and understanding of EI by determining if one or more personality factors and executive functions have a predictive relationship with EI when measured by the emotional intelligence scale (Schutte et al., 1998), the big five inventory-10 (BFI-10; Rammstedt & John, 2007), and the deficits in executive functioning scale (Barkley, 2011). Further, the participants will have different vital factors such as age, sex, and location collected for demographic purposes.

The study was exploratory in order to determine if there are correlations between personality factors, executive functions, and EI. A multiple linear regression analysis, or multiple linear regression, that includes more than one predictor variable provided the opportunity to assess how well dependent variables can be predicted against multiple

predictor variables. Further, the multiple linear regression analysis provided information on how much variance is predicted by each predictor variable when the other predictor variables are statistically controlled (Warner, 2013). Assumptions of a multiple linear regression analysis indicate the dependent variable is measured at the ordinal level. Secondly, one or more of the independent variables are continuous, ordinal, or categorical. Third, there is no multicollinearity between the variables. Last, the variables have proportional odds. The data collected was assessed to determine if it meets these assumptions prior to running the multiple linear regression.

Methodology

Population

The target population was a sample of adults ages 25- to 65-years-old. The target age range was decided based on developmental trajectories over a lifespan. According to Berk (2010), early adulthood, ranging from 25 – 40 years, is a time when cognitive processes begin to shift towards advanced experience-dependent brain growth and ultimately start to flatten or drop off in late adulthood, ranging from 65-years to death. Early adulthood to late adulthood, while there is variability within the cognitive process provided the least variability due to more consistent developmental growth.

Inclusion and Exclusion Criteria

To participate in this study, participants needed to be between the age of 25 – 65 years old, as determined by life span development and to reduce exposure to vulnerable populations. Participants needed to have access to the internet to complete the survey, and therefore individuals who do not have access were excluded from this study.

Sample Size Analysis

A G-power analysis was conducted to determine the appropriate sample size for the study. According to Faul et al. (2009), a priori power analysis provides the desired effect size, the α level, and the desired power level. According to Cohen (1992), it is suggested to use an effect size of .02 (small), .15 (medium), or .35 (large) to obtain reliable and scholarly analysis of statistical data when performing multiple regression studies. Therefore, for the purpose of this study and number of variables, a medium effect size of 0.15 was most appropriate. An alpha level of .05 is used ensure there is no risk of rejecting the null hypothesis within the scope of this analysis. Given the number of variables, effect size, α level, and power level, G-power analysis suggests a sample size of 89 participants.

Research Procedures

Recruitment, Participation, and Data Collection

Participants were primarily recruited through social media sites. Using social media platforms, such as Facebook, Twitter, and LinkedIn, to disseminate the survey link supported a timely recruitment process at a minimal cost. To support the outreach to more individuals, the use of Facebook's advertising program was utilized with permissions and following all guidelines set forth by the company for public use. Participants were asked to share the survey link with others to increase the potential sample population. This is known as snowball sampling.

The use of Survey Monkey to collect the data provided a familiar platform for users who have access to the internet. Individuals who chose to participate in the study by

completing the survey were provided informed consent prior to beginning. To ensure participant confidentiality, no identifying information was collected, and the individuals were encouraged to keep a copy of their informed consent for their own records. The informed consent also provided the individual with contact information for the researcher and affiliated university.

Instrumentations

The instrumentation used to collect data on the different variables included three different questionnaires. Each questionnaire addressed the three overarching constructs that are being measured – EI, personality traits, and executive functions.

Emotional Intelligence Scale

The Emotional Intelligence Scale, developed by Schutte et al. (1998), is used as a self-report measure to help identify traits of EI. Self-rated inventories are sometimes used as alternatives to ability-based tests of EI for ease of use and time savings. The scale consists of 33 questions derived from Salovey and Mayer's (1990) four trait model that relate to a person's emotions and aim to identify the extent to which each statement relates to the individual. Individuals answer based on a Likert scale ranging from 1 (*strongly agree*) to 5 (*strongly disagree*).

The scale is considered a homogeneous construct of EI after a factor analysis of a larger pool of items suggested a one-factor solution of 33-items (Schutte et al., 1998). The 33-items scale identifies appraisal and expression of emotion in the self and others, regulation of emotions in the self and others and utilization of emotions in solving problems. Schutte et al. (1998) report a cross-check of internal consistency showed a

Cronbach's alpha of 0.87 and a two-week test-retest reliability of 0.78. Ciarrochi et al. (2001, 2002) pulled responses from adolescents and university students to report internal consistency for the following subscales : Perception of Emotion, .76, .80; Managing Own Emotions, .63, .78; Managing Others' Emotions, .66, .66 and Utilization of Emotion, .55, (the alpha for this scale was not reported in Ciarrochi et al., 2002).

Further, the scale showed evidence of validity. The scale was measured against nine other measures which are theoretically related to EI, including awareness of emotions, outlook on life, depressed mood, ability to regulate emotions and impulsivity. Scores on the scale differed between groups that were expected to differ on levels of EI. For instance, Brackett and Mayer (2003) found that scores were correlated with scores on the EQ-I and the MSCEIT, indicating a significant relationship at $r = 0.43$.

The scale also showed evidence of discriminant validity when measured against SAT scores and personality. Schutte et al. (1998), Brackett and Mayer (2003), and Bastian et al. (2005) respectively reported the following correlations between the Assessing Emotions Scale and each of the Big Five Dimensions: extraversion, .28, .32, .61; agreeableness, .26, .09, .23; conscientiousness, .21, .25, .32; emotional stability, .28, .19, .37; and openness, .54, .43, .43. These correlations indicate that across studies scores on the Assessing Emotions Scale are relatively distinct from scores on each of the Big Five Dimensions.

Big Five Inventory-10

The big five inventory-10 (BFI-10) was adapted by Rammstedt and John (2007) to measure personality in one minute or less. This inventory is a 10-item short version of

the big five inventory and has been adapted in English and German. Individuals who are completing the inventory are asked ten questions regarding their personality and asked to answer on a Likert scale ranging from (1) *disagree strongly*, (2) *disagree a little*, (3) *neither agree or disagree*, (4*) agree a little*, or (5) *agree strongly*.

The brevity of this scale supports time restraints often found in research settings, while maintaining acceptable psychometric properties (Rammstedt & John, 2007). Several studies demonstrate acceptable reliability estimates for the BFI-10. In a sample of American students, Rammstedt and John (2007) demonstrated test-retest correlations between *r*=.65 (Openness) and *r*=.79 (Extraversion) over a period of 6 to 8 weeks. Comparable results were found for the German BFI-10 items in several studies. For example, Rammstedt et al. (2014) reported retest correlations between *r* =.49 (Neuroticism) and *r* =.62 (Openness) over a period of 6 weeks. Further, this BFI-10 shows high intercorrelations to the longer form BFI-44 ([*r* = 0.83]; Rammstedt & John, 2007).

According to Rammstedt and John (2007) there are relatively low correlations among the Big Five scales, ranging from *r* = .08 to *r* = .13. Furthermore, in subsequent studies, factor analyses reveal a simple-structure of the items with substantial loadings on the convergent factor (averaged .64) and negligible secondary loadings on the four other factors ([averaged .08] Rammstedt & John, 2007; Rammstedt et al., 2013; Rammstedt et al., 2014). Although the reduction in the number of BFI items did lower external validity when compared to NEO-PI-R, where the BFI-10 shares 45% of their variance with the

NEO-PI-R domain scales, the convergent validity remained substantial (r = .44) and the discriminant validity excellent ([r = .19]; Rammstedt & John, 2007).

Barkley Deficits in Executive Functioning Scale (BDEFS)

The BDEFS (Barkley, 2011) is used to assess deficits in EF in adults aged 18 years and older. The BDEFS is based on 16 years of research and stems from a large normative sample (N> 1,200) which is representative of the U.S. population, in terms of region, socioeconomic status, education, ethnicity/race, and gender (Barkley, 2011). The scale consists of 91-items rated on a Likert scale from (1) *rarely*, (2) *sometimes*, (3) *often*, and (4) *very often*. The scale was constructed based on executive function theories and three groups were compared to determine validity. For this study, the responses gathered will assess if the components of executive function have a relationship with the dependent variable of EI.

Barkley (2011) report the reliability of the scores is quite satisfactory as evidenced by high internal consistency (Cronbach's alpha ranging from .91 to .95 scores across the five scales); good interobserver agreement (.66 to .79 across scales), and high test-retest reliability over a 2–3-week interval (ranging from .62 to .90 across scales and .84 for the Total EF Summary Score). Lastly, a principal component factor analysis with varimax rotation indicated there are five factors measured on this scale, including self-management to time, self-organization/problem-solving, self-discipline/inhibition, self-motivation, concentration/attention, and self-activation/initiation.

In a study conducted by Franklin et al. (2018) the BDEFS was used to measure the impact of trait anxiety among men and women on EF. According to Franklin et al.

(2018) self-management to time has a sample-derived reliability of $\alpha = 0.77$, self-organization has a sample-derived reliability of $\alpha = 0.79$, self-restraint has a sample-derived reliability of $\alpha = 0.72$, self-motivation has a sample-derived reliability of $\alpha = 0.83$, and self-regulation of emotion has a sample-derived reliability of $\alpha = 0.92$.

Operationalization

These measures provided the needed data to operationalize the variables for the study. However, to obtain the variables for personality traits of extraversion, agreeableness, conscientiousness, neuroticism, and openness the questions from the BFI-10 that were associated with each variable were combined to create a standard score for each variable. For example, to operationalize the variable for extraversion questions three and eight were combined in SPSS to score the questions. To obtain an accurate score from the survey, question eight was reverse scored prior to exporting raw data to IBM Statistical Package for the Social Sciences (SPSS). The same process was completed for the questions associated with EI, self-management of time, organization/problem-solving, self-restraint, motivation, and emotional regulation. Reverse scores were completed in Survey Monkey prior to exporting to SPSS.

Data Analysis

Multiple linear regression permits the researcher to demonstrate whether an ordinal dependent variable can be predicted given one or more independent variables. This type of regression can also be used to predict dependent variables based on interactions between independent variables. Using multiple linear regression for the current study permitted the researcher to identify if personality traits or executive

function have a statistically significant effect on EI, or if there is an interaction between personality traits and executive functions that show a statistically significant effect on EI.

Data was gathered initially through Survey Monkey and then downloaded into version 24 of SPSS, a software package used for statistical analysis. Data was carefully inspected to ensure there are no coding errors during the transfer. Assumptions of a multiple linear regression analysis indicate the dependent variable is measured at the ordinal level. Secondly, one or more of the independent variables are continuous, ordinal, or categorical. These assumptions are identified by the type of data being collected as all ordinal variables. An analysis was run to address assumptions of multicollinearity between the variables and the variables have proportional odds.

Research Question and Hypotheses

Research Question: What is the relationship between the personality traits of openness, agreeableness, extroversion, conscientiousness, and neuroticism and the executive functions of self-management to time, self-organization/problem-solving, self-discipline/inhibition, self-motivation, concentration/attention, and self-activation/initiation to predict the total variance of EI?

H_1: There is a relationship between personality traits and executive function in the variance of EI.

H_0: There will be no relationship between personality traits and executive function in the variance of EI.

Threats to Validity

There are several threats to validity that should be addressed. First, the use of self-reports has shown to be susceptible to faking good, or report bias (Schutte et al., 2011). There is a tendency for participants to respond to questions on self-report questions in a way they believe is socially desirable. In order to reduce this threat to internal validity the participants will be reminded that truthful responses will provide the most accurate results for the study and their identity is anonymous.

A second threat to validity occurs from recruitment procedures. Participants who volunteer to complete the survey are not guaranteed to be an accurate representation of the general population (Creswell & Creswell, 2017), thus reducing the ability to generalize the results of the study to other populations. Further, confounding is another threat to external validity that must be addressed. Confounding suggests that the results of the study may be impacted by variables that cannot be accounted or controlled for in this type of study. Again, reducing the ability for the results to be generalized.

Ethical Considerations

The study presents very few ethical considerations. Careful consideration was taken to ensure the least amount of risk or harm to human life when developing the study. All participants were adults, and the topic did not require any sensitive information to be collected. Participation was completely voluntary, and participants were able to withdraw at any time by discontinuing the survey. Further, surveys included an informed consent providing details of the study, their rights, methods for collecting and storing data, and contact information of the researcher and Walden representative. To ensure all ethical

considerations are in place, the study underwent approval through Walden University's Internal Review Board (IRB), approval was granted on March 26, 2021, with IRB approval # is 03-26-21-0519015.

Further, after approval was obtained data was collected initially through Survey Monkey which is a secure site. The use of Survey Monkey ensured site security. SurveyMonkey (2020) maintains a documented vulnerability management program which includes periodic scans, identification, and remediation of security vulnerabilities on servers, workstations, network equipment, and applications. All networks, including test and production environments, are regularly scanned using trusted third-party vendors (Survey Monkey, 2020). Critical patches are applied to servers on a priority basis and as appropriate for all other patches (Survey Monkey, 2020). Survey Monkey (2020) also conducts regular internal and external penetration tests and remediate according to severity for any results found. Once the required number of participants was reached data was transferred to SPSS and stored on a password encrypted hard drive that will only be accessible by the researcher. The data that was collected will be deleted and destroyed after the five-year period as required by the university.

Summary

The purpose of this quantitative, non-experimental, cross-sectional correlation research study was to determine if personality traits and executive functions have a relative and combined effect on EI. The purpose of the study correlates with the research design by attempting to examine the degree of the relationship between the variable and

if there is a combined effect between the two independent variables on the dependent variable of EI.

This chapter was an overview of the research design and methodology that was used to conduct the study. It included the recruitment procedures, participants, and data collection methods. Further, it outlined the instrumentation that was used to collect the required data for the study. A review of the research questions was provided, along with the possible threats to the validity of the study and measures that will be taken to possibly counteract those issues. Last, ethical considerations were noted.

Chapter 4: Results

Introduction

The purpose of this qualitative study was to identify possible predictors of EI. In this chapter, I describe the processes used for data collection and the analysis of this data to answer the RQ and test the hypotheses. The results are presented with tables included to help illustrate the findings. The findings included in this chapter include descriptive statistics, evaluation of assumptions, and the statistical analyses used to address the study's RQ.

The RQ for this study was, what is the relationship between the personality traits of openness, agreeableness, extroversion, conscientiousness, and neuroticism and the executive functions of self-management to time, self-organization/problem-solving, self-discipline/inhibition, self-motivation, concentration/attention, and self-activation/initiation to predict the total variance of EI? The hypotheses were as follows:

H_1: There is a relationship between personality traits and executive function in the variance of EI.

H_0: There will be no relationship between personality traits and executive function in the variance of EI.

Data Collection

Recruitment for this study began on March 28, 2021, after obtaining IRB approval (#03-26-21-0519015). The use of an online survey created through Survey Monkey provided a link that was used to recruit potential participants through Facebook, Instagram, and LinkedIn. The link for the survey was shared on these sites and boosted

to reach a larger audience. Further, it was encouraged for individuals to share the post to further enhance the reach of participants. The post allowed potential participants to click the link sending them to the survey. To begin the survey, participants needed to indicate their approval by clicking on the consent form. Data collection officially ended April 24, 2021. I removed incomplete surveys and surveys completed by participants who did not meet the inclusion criteria (adults, ages 25 – 65 years of age). After completing this initial cleanup of data, 90 of the 123 responses were viable for analysis.

Data Analysis Procedures

After the initial clean-up of data in Survey Monkey, the raw data for the 90 participants was transferred to SPSS, Version 27, to begin the process of testing for assumptions and descriptive statistics. Multiple linear regression was conducted to examine the relationship between EI, personality traits, and EF. To accurately measure these different variables, the raw data was transformed from the questionnaire responses into the variables. To obtain the variables for personality traits of extraversion, agreeableness, conscientiousness, neuroticism, and openness, the questions from the BFI-10 that were associated with each variable were included in the transformation in SPSS. The same process was completed for the questions associated with EI, self-management of time, organization/problem-solving, self-restraint, motivation, and emotional regulation. Once transformations of raw data were completed in SPSS the model was left with 11 variables to work with in the regression.

Results of the Study

Demographics

There was a total of 123 participants from the United States who attempted to complete the survey. The survey, located on Survey Monkey, was accessed via a Facebook, Twitter, and LinkedIn link. It consisted of demographic information and three self-report questionnaires: the emotional intelligence scale, the big five inventory-10, and Barkley deficits in executive functioning scale. From the 123 participants, 90 were eligible for data analysis due to incomplete responses by 33 participants. Participant demographics (*N*=90) are shown in Table 1. Age was measured as a nominal variable where participants were able to indicate their age range starting at 25-34, 35-44, 45-54, and 55-65. Gender was measured as a categorical variable. The majority of the participants were female (76.7%) between the ages of 55-65 years (41.1%). The age range with the second largest response rate was between the ages of 35-44 years (25.5%).

Table 1

Descriptive Statistics for Sample Demographics (n=90)

Variable		*n*	Percent
Age	25-34 years	16	17.8
	35-44 years	23	25.6
	45-54 years	13	14.4
	55-65 years	37	41.1
Gender	Male	20	22.2
	Female	69	76.7

Descriptive Statistics of Study Variables

An analysis of the descriptive statistics was conducted for the variables of interest. The results of the analysis can be found in Table 2. The data met the assumption of non-zero variances. Results indicate a mixed variance among the variables. Variables of executive function, self-management to time, organization/problem-solving, self-restraint, motivation, and emotional regulation, showed a high variance. While the variables of personality factors, extraversion, agreeableness, conscientiousness, neuroticism, and openness, showed a low variance. High variance indicates the data is spread further from the mean, while low variance indicates the data points are closer to the mean.

Table 2

Descriptive Statistics for Study Indices

Variables	*n*	Min	Max	*M*	*SD*	Variance
Emotional Intelligence	90	82	162	124.98	16.47	271.30
Extraversion	90	4	10	6.79	1.20	1.45
Agreeableness	90	3	10	6.52	1.56	2.43
Conscientiousness	90	4	9	6.73	1.21	1.46
Neuroticism	90	2	10	6.28	1.32	1.73
Openness	90	4	10	6.93	1.31	1.70
Self-Management to Time	90	18	59	33.49	10.81	116.90
Organization/Problem-Solving	90	24	84	37.63	12.51	156.39
Self-Restraint	90	18	60	29.13	8.94	79.98
Motivation	90	12	42	17.04	5.87	34.49
Emotional Regulation	90	13	52	23.02	9.26	85.80

Note. * Indicates $p < .05$; I don't know** indicates $p < .01$. *M* and *SD* are used to denote mean and standard deviation.

Statistical Model Assumptions

Prior to moving forward with the multiple linear regression, it was necessary to ensure that all assumptions of the analysis were properly met. I conducted tests to determine if the assumptions of a linear regression were met, including outliers, collinearity, independent errors, normality, homoscedasticity, and linearity. The sample size was deemed to be a total of 89 given the number of independent variables. To proceed with the linear regression the model must have one dependent variable that is

continuous and at least one independent variable that is continuous, each of these assumptions are met within the regression model. An analysis of standard residuals was carried out, which indicated that the data contained no outliers (*Std. Residuals Min = -3.04, Std. Residuals Max = 1.93)*, as depicted in Table 3.

Table 3

Residuals Statistics

	Minimum	Maximum	Mean	Std. Deviation	*N*
Predicted Value	99.13	144.67	124.98	9.38	90
Residual	-43.69	27.87	.000	13.54	90
Std. Predicted Value	-2.76	2.10	.000	1.00	90
Std. Residual	-3.04	1.93	.000	.94	90

Note. [a] Dependent Variable: Emotional Intelligence

Tests to see if the data met the assumption of collinearity indicated the multicollinearity was not a concern. Table 4 depicts the variable coefficients including collinearity statistics. If the VIF value is greater than 10, or the Tolerance level is less than 0.1 it would suggest concerns with collinearity.

Table 4

Measure of Collinearity

Independent Variables	Tolerance	VIF
Extraversion	.90	1.11
Agreeableness	.88	1.14
Conscientiousness	.85	1.18
Neuroticism	.91	1.10
Openness	.96	1.05
Self-Management to Time	.51	1.97
Organization/Problem-Solving	.49	2.04
Self-Restraint	.33	3.01
Motivation	.43	2.33
Emotional Regulation	.33	3.08

Next, a Durbin-Watson test was conducted to assess for independence of residuals. Durbin-Watson values should be between 0 and 4, with a value as close to 2 to meet the assumption. The data met the assumption of independence of residuals *(Durbin-Watson value = 2.07).* To assess the linearity a scatterplot of the different personality factors and executive functions against EI with superimposed regression line was plotted. Visual inspection of these two plots indicated a linear relationship between the dependent variable of EI and independent variables. Figure 1 depicts the scatterplot showing the relationship between the dependent and independent variables. Partial regression plots were completed to indicate the relationship between EI and each independent variable.

Figure 2 through Figure 11 depicts the scatterplots for each of these variables, indicating a linear relationship with each.

Figure 1

Scatterplot of Linearity of Dependent and Independent Variables

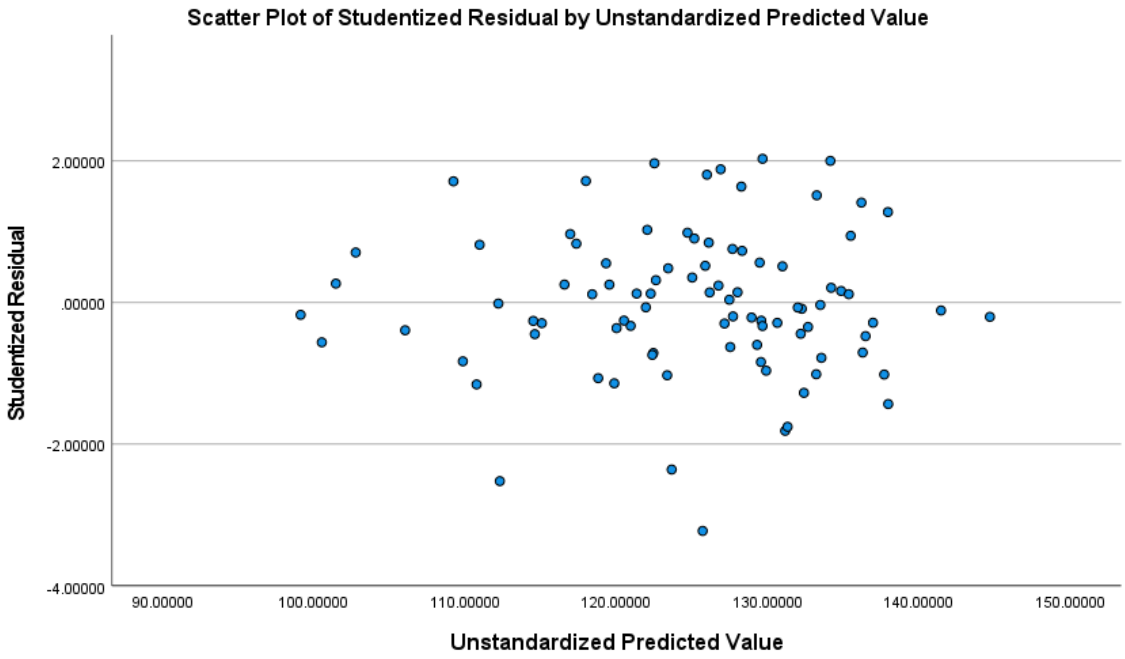


Figure 2

Scatterplot of Linearity for Independent Variable of Extraversion

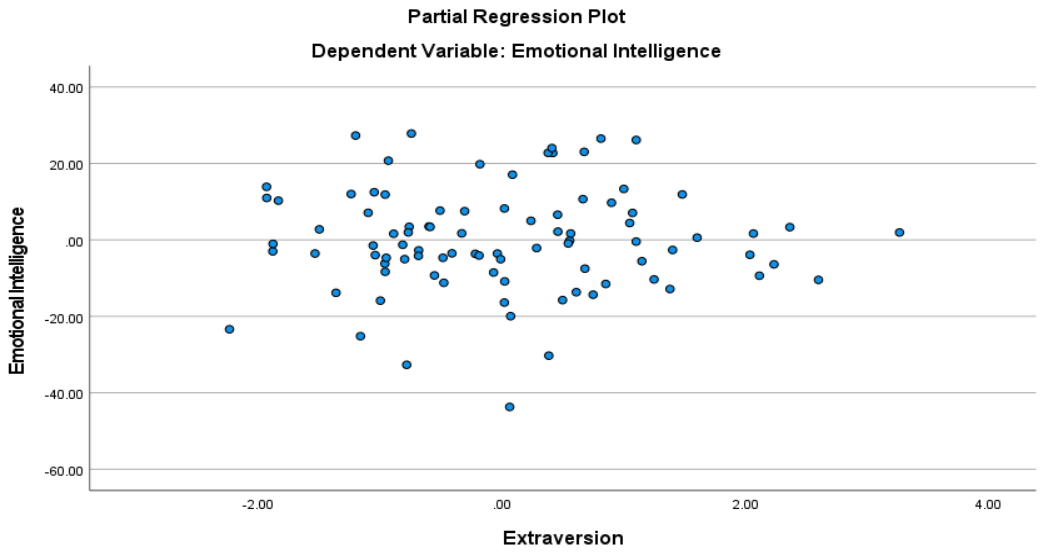


Figure 3

Scatterplot of Linearity for Independent Variable Agreeableness

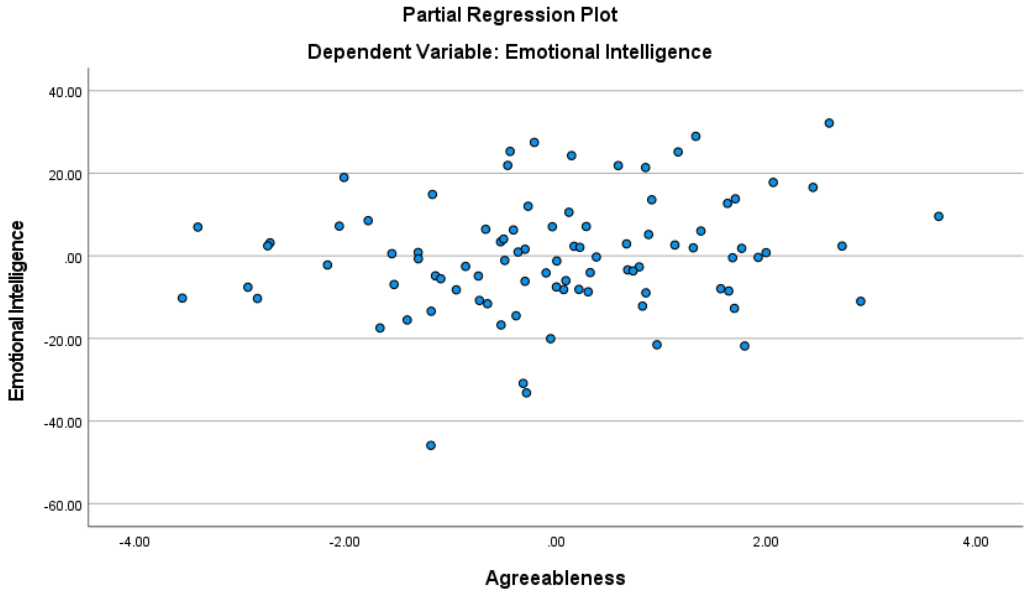


Figure 4

Scatterplot of Linearity for Independent Variable of Conscientiousness

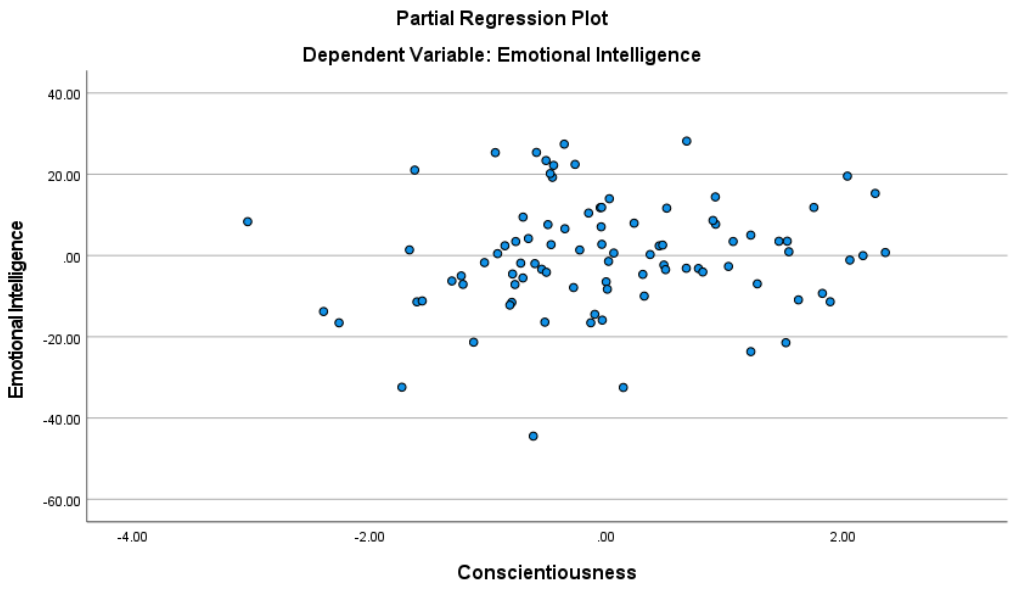


Figure 5

Scatterplot of Linearity for Independent Variable of Neuroticism

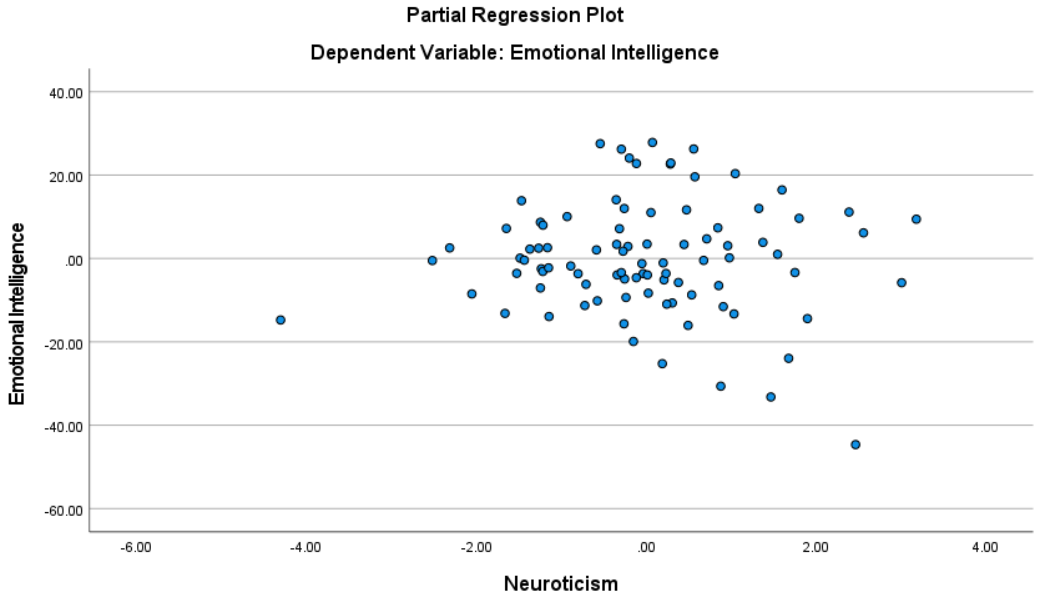


Figure 6

Scatterplot of Linearity for Independent Variable of Openness

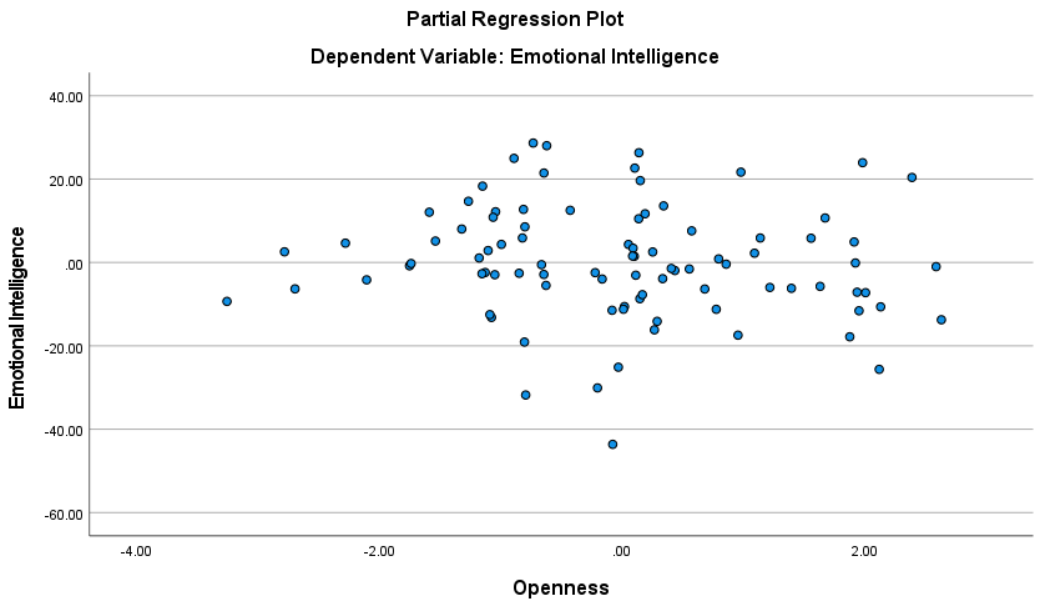


Figure 7

Scatterplot of Linearity for Independent Variable of Self-Management to Time

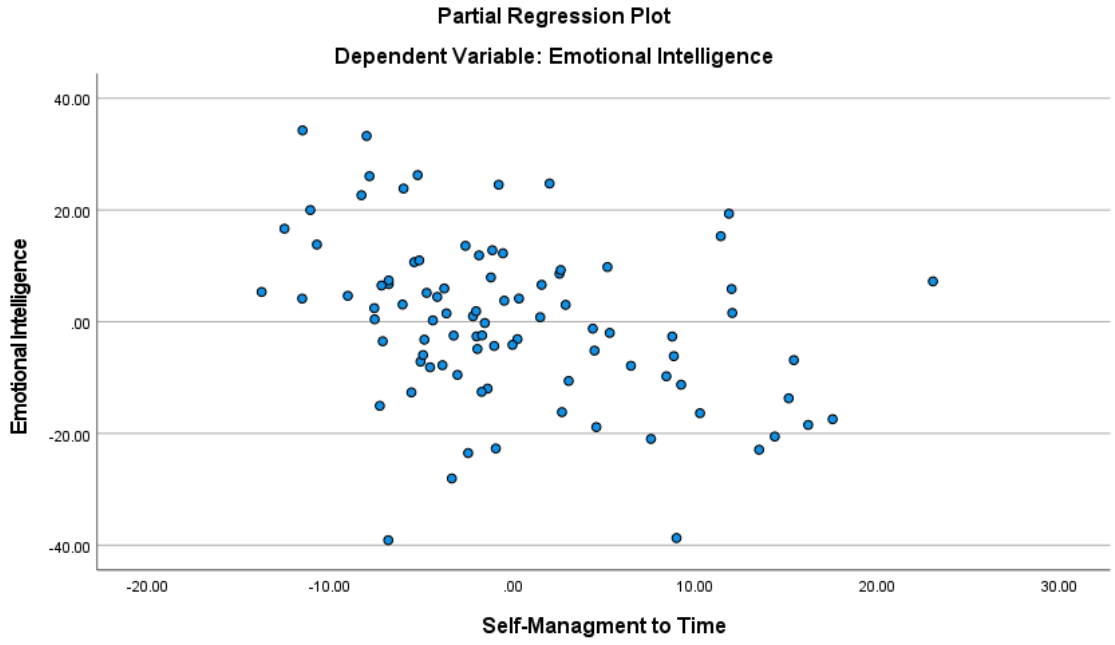


Figure 8

Scatterplot of Linearity for Independent Variable of Organization/Problem-Solving

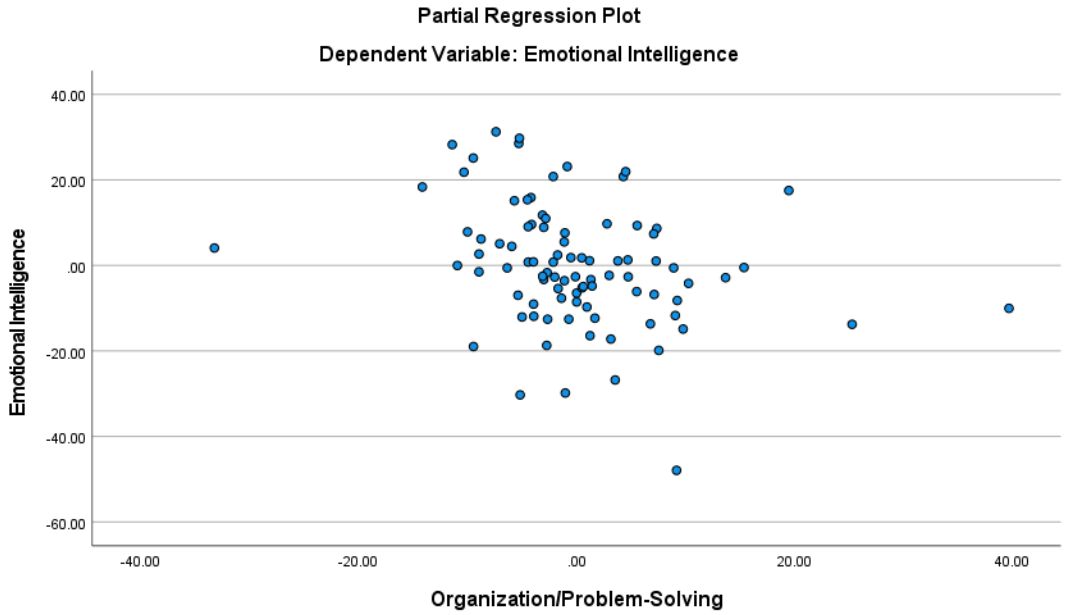


Figure 9

Scatterplot of Linearity for Independent Variable of Self-Restraint

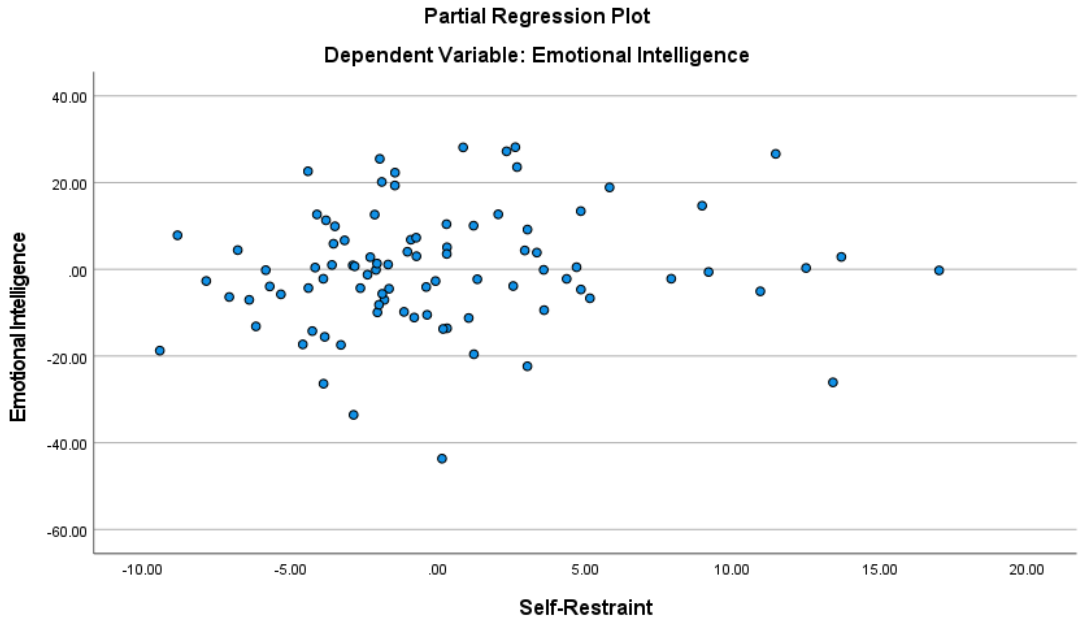


Figure 10

Scatterplot of Linearity for Independent Variable of Emotional Regulation

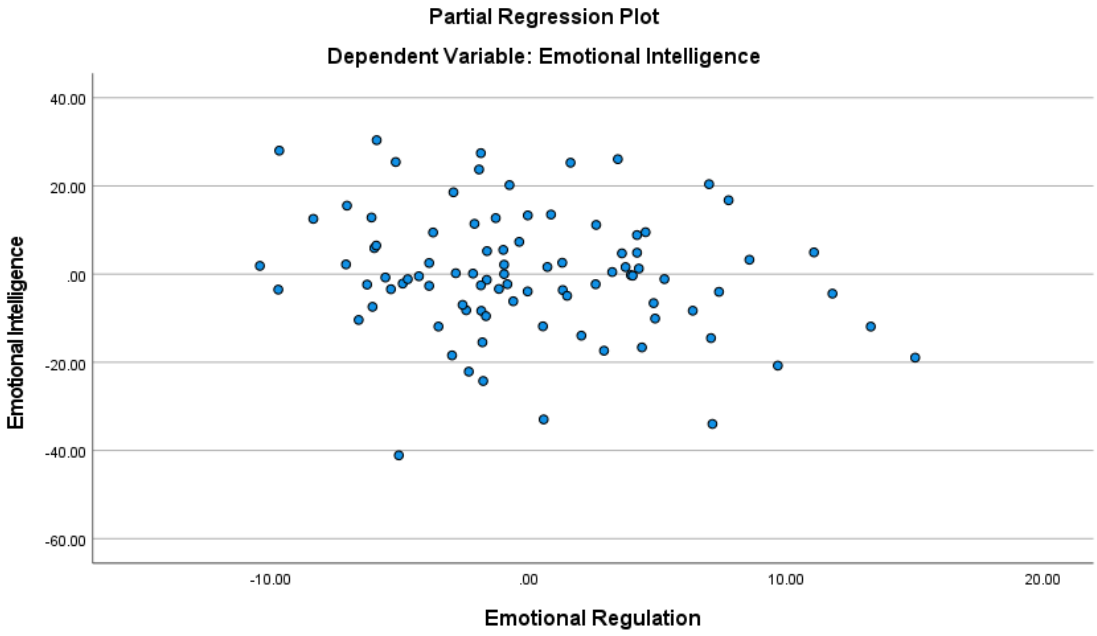
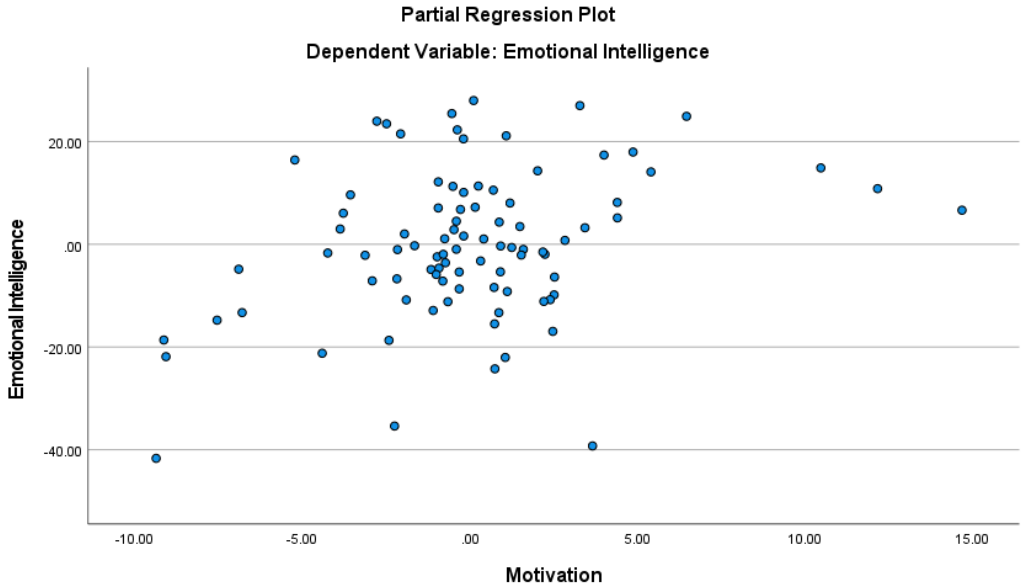


Figure 11

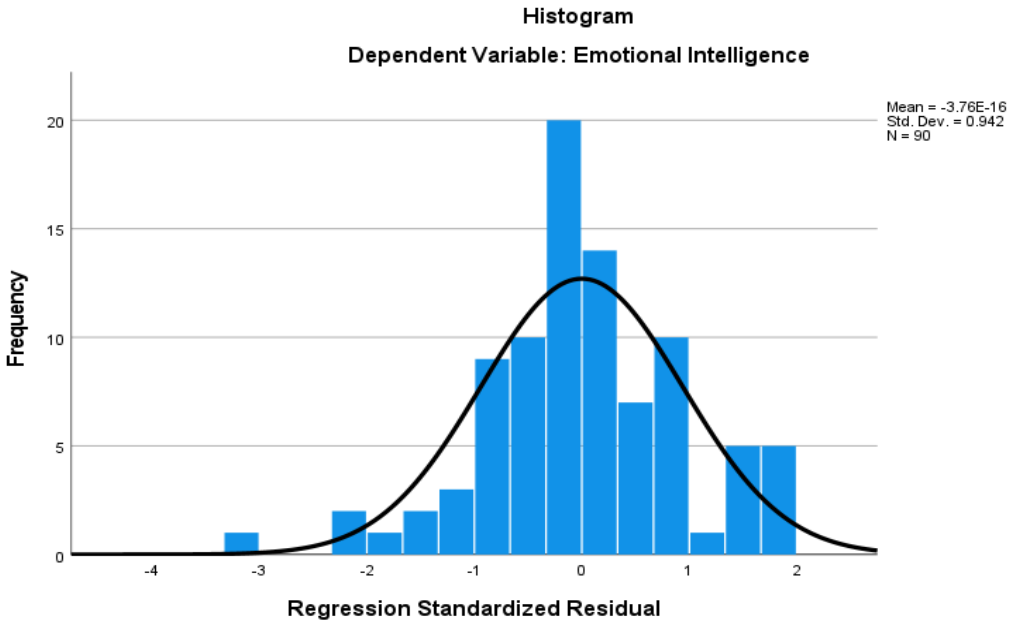
Scatterplot of Linearity for Independent Variable of Motivation

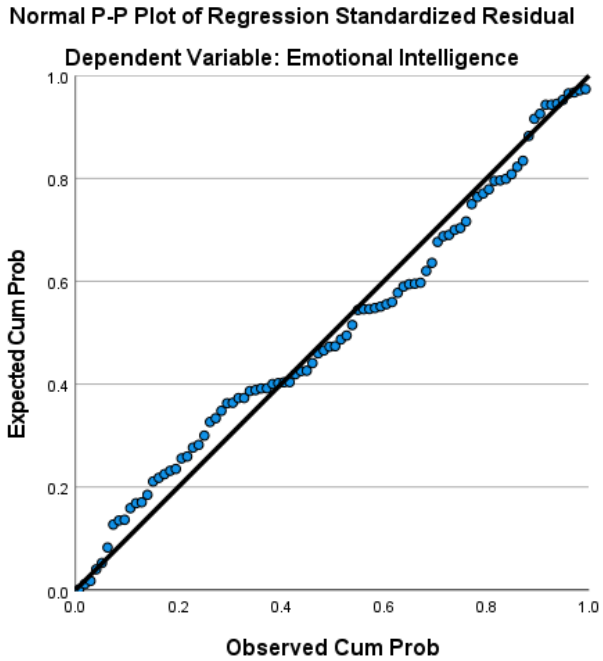


There was homoscedasticity, as assessed by visual inspection of a plot of studentized residuals versus unstandardized predicted values, shown in Figure 1. Normality of residuals was identified through visual inspection of a histogram with superimposed normal curve and a P-Plot, shown in Figure 12. Residuals were normally distributed as assessed by visual inspection of a normal probability plot.

Figure 12

Normality of Residuals Histogram and P-Plot





Regression Model Results

A multiple linear regression was run to understand the relationship between personality factors and executive function with EI. Emotional regulation, openness, extraversion, conscientiousness, neuroticism, agreeableness, self-management to time, organization/problem-solving, motivation, and self-restraint account for 32.4 % of the variance in Emotional Intelligence with adjusted R^2=23.9% (Table 5), a medium effect size according to Cohen (1988). The model as a whole was able to significantly predict EI, (10, 79) = 3.792, R^2 = .324, as depicted in Table 5.

Table 5

Model Summary

Model	*R*	*R* Square	Adjusted *R* Square	Std. Error of the Estimate	Durbin-Watson
	.569[a]	.324	.239	14.37100	2.068

Note. [a] Predictors: (Constant), Emotional Regulation, Openness, Extraversion, Conscientiousness, Neuroticism, Agreeableness, Self-Management to Time, Organization/Problem-Solving, Motivation, Self-Restraint.

[b] Dependent Variable: Emotional Intelligence.

Table 6

ANOVA

Model	Sum of Squares	*df*	Mean Square	*F*	Sig.
Regression	7830.441	10	783.044	3.792	.000[b]
Residual	16315.514	79	206.525		
Total	24145.956	89			

Note. [a] Dependent Variable: Emotional Intelligence

[b] Predictors: (Constant), Emotional Regulation, Openness, Extraversion, Conscientiousness, Neuroticism, Agreeableness, Self-Management to Time, Organization/Problem-Solving, Motivation, Self-Restraint.

In the final model, three predictors were significant with self-management to time providing the highest contribution (*t* = -3.047 B = -.433), org/problem (*t* = -2.645 B = -.349), and motivation (*t* = 3.069 B = .433) provided a significant contribution. The regression equation is as follows: Y (EI) = 136.203 + .033(extraversion score) + 1.857 (agreeableness score) + 1.224(conscientiousness score) + .381(neuroticism score) + 1.094(openness score) + .674(self-management to time score) + ..460(organization/problem-solving score) + .316(self-restraint score) + 1.215(motivation score) + .515(emotional regulation score). Findings from the regression are shown on Table 7. Using the regression equation and value of EI provided outcomes for mean predicted value. The predicted mean EI for the variables that were found to be statistically significant in this regression (self-management to time, organization/problem-solving, and motivation) are displayed in the “contrast estimates”

row of Table 8. Predictions were made to determine the mean EI for a 40-year-old with high self-management to time, high organization/problem-solving, and high motivation. Mean EI was predicted as 140.37 (95% CI, 133.68 to 147.06).

Table 7

Summary of Regression Analysis

Variables	*B*	*SE B*	β	*t*	*p*
Extraversion	.033	1.331	.002	.025	.980
Agreeableness	1.857	1.043	.176	1.781	.079
Conscientiousness	1.224	1.368	.090	.895	.374
Neuroticism	-.381	1.213	-.030	-.314	.754
Openness	-1.094	1.193	-.087	-.916	.362
Self-Management	-.674	.198	-.443	-3.407	.001
Organ/Problem-Sol	-.460	.174	-.349	-2.645	.010
Self-Restraint	.316	.296	.171	1.068	.289
Motivation	1.215	.396	.433	3.069	.003
Emotional Regulation	-.515	.289	-.290	-1.785	.078

Table 8

Prediction of EI (K Matrix)

Contrast		Emotional Intelligence
L1 Contrast Estimate		140.368
Hypothesized Value		0
Difference (Estimate - Hypothesized)		140.368
Std. Error		3.367
Sig.		.000
95% Confidence Interval	Lower Bound	133.675
	Upper Bound	147.060

Note. [a] Based on the user-specified contrast coefficients (L') matrix number 1.

Summary

The chapter consisted of an explanation of data collection and analysis. I took you through the steps needed to run the regression model, including the assumptions and how they were met. The findings from the analysis indicated the model was significant for predicting EI, with three specific variables showing a significant relationship with this prediction. In the final chapter, I will further examine the findings, specifically within the context of other theoretical findings. Results from this study will indicate recommendations for future research in line with the limitations from this current study.

Chapter 5: Discussions, Conclusions, and Recommendations

Introduction

The purpose of this quantitative study was to determine if there is a relationship between personality traits, executive functions, and EI. The study's purpose was to use predictive correlation to investigate if there is a relationship between the variables. This study was a continuation of past studies looking for predictive variables of EI. Although much of the previous studies looked primarily at the relationship of personality and emotional regulation (Hughes, et al. ; Petrides et al.), this study included an investigation into the relationship of all executive functions which include emotional regulation. Using a multiple regression analysis, I was able to study the predictive value of these variable with EI.

The results from the study allowed for a rejection of the null hypothesis because the model of the regression was significant. However, not all the variables were a significant contributor to the prediction of EI. Results suggest that executive functions of self-management to time, organization/problem-solving, and motivation have a significant predictive value for EI. These findings suggest new understanding within the literature regarding the construct of EI. In this chapter, I will provide a deeper interpretation of the findings in relation to previous studies discussed in Chapter 2. I will also go through the limitations, recommendations, and implications for social change which emerged from this study.

Interpretation of the Findings

Drawing from previous research investigating aspects of EI, Chapter 2 provided a review of important findings with respect to this study. Findings from this study further confirm previous findings; however, they also extend knowledge within the construct of EI. Previous research focused on the relationship between EI and personality factors. Research has also predominantly studied personality-driven differences in how people regulate (i.e., regulation strategies) with less known about personality-driven differences in why people regulate (Gross & Cassidy, 2019; Pruessner et al., 2020). What research there is (e.g., Eldesouky & English, 2018) suggests that further work will prove fruitful in helping to explain individual differences in emotion regulation. Yet, little of this previous research has focused on the role of EF, which is a primary component of emotional regulation.

This current study did not reveal a specific correlation between personality factors as predictors of EI. However, the overall model was significant for predicting higher EI in individuals between the ages of 25 – 65 (R^2 = .324). Unlike much of the research that has been conducted regarding EI and personality factors, this study did not reveal any significant correlations between EI and the FFM of personality factors. The previous studies conducted were attempts to understand whether trait EI – a perspective on EI pioneered by Petrides and colleagues (Pertrides & Furnham, 2001) – is linked with the FFM of personality or a construct of its own (Hughes et al., 2018). Much of the research found a significant correlation between personality factors and emotional constructs (Carver & Connor-Smith, 2010; Petrides, 2010; Schindler & Querengässer, 2019). Yet

there remains continued disagreement on what extent trait EI falls within an existing personality model, or whether it captures a new factor of personality (Hughes et al., 2018). Results from my study suggest it may be reasonable to continue to pursue an understanding of whether EI captures a new factor of personality, as the findings suggest personality factors may not be an adequate predictor of EI. Interestingly, however, this study did reveal a correlation between factors of EF, but not emotional regulation specifically.

Findings from this study suggest that EF may have a stronger correlation with the prediction of higher EI than personality factors alone. While the overall regression model successfully predicted a 32.4% variance in EI, the specific variables which were found to be significantly correlated were related to EF. Research has predominantly examined personality concerning a limited range of emotional regulation strategies (e.g., avoidance, reappraisal, suppression) and completely neglected relations between personality and implementation tactics. Findings from this study suggest executive functions of self-management (B = -.674, p = .001), motivation (B = 1.215, p = .003), and organization/problem-solving (B = -.460, p = .010) have the largest contribution to EI.

Different behavioral patterns emerge in the cognitive processes that allow mental flexibility when adapting to different emotional contexts. The use of emotional regulation in cognitive processes has been associated with other EFs of inhibition, working memory, and shifting (Pruessner et al., 2020). Further, the relationship between this different EF (working memory, inhibition, shifting, and emotional regulation) has shown that working memory has an association with negative affect reduction and aspects of emotional

behavior and regulation (Hendricks & Buchanan, 2016). Results from my study suggest similar findings in that components of EF promote EI. When looking at emotional regulation, while it did not show a significant relationship (p = .078), it was among one of the variables with a stronger correlation than others.

Implications

This research study further contributes to the growing body of knowledge regarding EI and the implications EI has within different domains of social issues. While the findings from this study do not support a correlation between personality factors and EI, it does support the increasing question within the literature of whether EI may be better understood as another level of personality itself. Further, the findings add to the understanding of how emotional regulation may impact EI, in that we can now correlate other components of executive function with increased EI. Based on the findings from this study, the strongest predictors of EI were a person's ability to self-manage their time, organize themselves, problem-solve, and motivate themselves. This provides unique information for those in the field to better understand how EF may interact with emotional regulation and increase EI.

Further, previous research has shown the efficacy of EI within physical and psychological health (Fernandez-Abascal & Martın-Dıaz, 2015), psychopathology (Davis & Humphrey, 2012; Mikolajczak et al., 2009), academic performance (Di Fabio & Saklofsmotike, 2018), and prosocial and antisocial behaviors (Gugliandolo et al., 2015; Petrides et al., 2006). Findings may lend to interventions aimed to support individuals who struggle with maladaptive coping skills. This information may help guide mental

health practitioners and others in supporting individuals to enhance their EF which may in turn increase EI. Moreover, these findings contribute to the understanding of EI through the lens of ability EI. Meaning, early studies of EI focused on this construct as a component of cognitive functioning. These findings suggest that cognitive functions, do indeed, have a strong correlation with the level of EI.

Limitations of the Study

There are several limitations to this research study. Although there is an assumption that participants will provide an accurate and truthful portrayal of themselves when completing the self-report surveys, it cannot be guaranteed. Self-report bias is a limitation to the study based on the nature of the survey questions. Further, this study was limited by the convenience sampling strategy selected. Self-selection bias is present in this study as the participants volunteered for this study, and there is no way to ensure the sample represents the general public. Therefore, findings from this study may not be broadly generalizable. Further, the limitation inherent within correlational studies leads to the inability to assume causation. This study does not indicate whether personality traits or executive functions cause changes in EI development.

Recommendations

While the findings from this study provide new insights into the predictors of EI, it is important to take limitations of this study into consideration. Future studies should look to replicate these findings within a larger population to support generalizability. However, future studies should continue to view EI through the lens of executive functions by expanding the research to include larger sample sizes to gain more insights

into the correlations between EI and EF. Larger participant pools may show differences in correlations that may provide findings similar to previous studies where personality traits were shown to have strong correlations with EI. Future studies may want to look at the relationship between personality traits and executive functions to look at the potential relationship between these factors. Looking at relationships between personality traits and executive functions could help answer the question of whether EI is better defined as another layer of personality.

Future studies may also consider examining the relationship of these factors in younger children. These studies could also provide insights into the interactions of executive functions within the development of EI. If studies within children provide similar results, it would suggest that working to create interventions aimed at executive function training may be more beneficial than the creation of intervention focused solely on EI.

Social Change

Social change stems through the identification of needed areas of change in social institutions, social behaviors, and social relationships. Based on previous findings, EI is known to have strong implications within different realms of society. The hope with this study is to increase the understanding of ways to increase EI in people. The construct of EI may help people to increase social relations, increase academic performance, and perhaps decrease antisocial behaviors. The findings from this study not only increase our understanding of what may contribute to increased EI, but it also increases our understanding of the possible reasons why. EF is known to be an essential aspect of

cognitive functioning and when these functions increase a person's overall functioning seemingly increases. Enhancing executive functions in individuals will in turn increase cognitive functioning and decrease emotional reactivity and stress. Perhaps when people have an overall sense of well-being, they are better able to increase their emotional awareness and subsequently their level of EI.

Conclusion

EI, since its emergence in the literature, has shown to have important implications in society. The results of this study presented similar findings to previous research, while enhancing the understanding with the literature as to the predictors of EI. Specifically, the findings indicate that the construct of EI seems better defined through the lens of cognitive functioning, as executive functions were the strongest correlation in this study. While personality factors seemingly have a relationship with EI based on past research, the current finding lend to the ongoing question of whether EI could be included within the personality hierarchy. Future studies should continue to identify relationships between these variables to gain more understanding of how EI develops in individuals. The current study opens the door to extend the research of cognitive and personality factors within EI.

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