2017

Five Factor Personality Traits in Schizophrenics with a History of Violent Behavior

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2017

Abstract

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by

Ashley E. Lust

MS, Walden University, 2013

BA, Ashford University, 2011

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Philosophy

Forensic Psychology

Walden University

May 2017

Abstract

The diagnosis of schizophrenia has been associated with increased risk of violence and aggression. However, the extent of this association in relation to displayed personality traits among individuals diagnosed with schizophrenia have not been fully investigated. The lack of research has resulted in an inability to determine why only some individuals with schizophrenia display violent tendencies when others do not. Guided by Costa and McCrae's five-factor model of personality and Eysenck's theory of personality and crime, the purpose of this study was to investigate the relationship between the five personality traits and the display of violence among individuals with schizophrenia, as well as the predictability of violence. A personality assessment was used to explore the personality of the participants (n = 111), individuals obtained by convenience sampling of data originally collected by Ohi, Shimada, and Kawasaki. Each of the participants included had been diagnosed with schizophrenia by at least two clinical physicians. One-way analyses of variance were performed for each of the five personality traits in order to distinguish any relationships. A binary logistic regression model was conducted in order to discover a model of predictability in regards to violent behavior among individuals with schizophrenia. Results confirmed previous research findings of a statistically significant relationship between neuroticism and violence. However, adding to the research was the result of a significant contribution of neuroticism in the prediction of violence among schizophrenics. Positive social changes arising from these findings include practitioners having the future abilities of designing specific treatment options for individuals diagnosed with schizophrenia based on personality.

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Dedication

To Donna Jean Lust, how I wish you were here to see my success.

Acknowledgments

I would like to thank my wonderful dissertation committee, Dr. Sandra Caramela-Miller and Dr. Tom Diebold. Without your continued guidance and scrutiny, my dissertation would never have turned out the way it did.

Thank you to Dr. Kazutaka Ohi, Dr. Takamitsu Shimada, and Dr. Yasuhiro Kawasaki for allowing me to utilize the data you had already collected. With all of your help, I was able to complete my dissertation within a shorter time frame. For that, I thank you all immensely.

Additionally, I need to thank my family for standing by me and pushing me to complete my goals. There were days I was unsure there would ever be an end, but your support helped me when I was afraid of failure.

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Chapter 1: Introduction to the Study

Introduction

Personality has been identified as a key predictor of displayed violence and criminal behavior among various types of individuals (Boduszek, Shevlin, Adamson, & Hyland, 2013; Kamaluddin, Shariff, Othman, Ishmail, & Saat, 2015; Skeem, Kennealy, Monahan, Peterson, & Appelbaum, 2016). Researchers have found a connection between personality traits, as described by Eysenck, and criminal thinking (Kamaluddin et al., 2015; Morizot, 2015). Individuals with displayed criminal behavior were described as being high in neuroticism, an aspect introduced by Eysenck and his theory of crime and personality (Kamaluddin et al., 2015). The need to look at the commonality of specific personality traits among individuals displaying violent behaviors also provides potential benefits within various aspects of society.

With a connection found between psychoticism and criminal behavior, it comes as no surprise that individuals with a diagnosis of schizophrenia would have high levels of criminal activity (Bo, Abu-Akel, Kongerslev, Haahr, & Simonsen, 2013a; Edlinger et al., 2014; Fazel, Wolf, Palm, & Lichtenstein, 2014). Researchers Maghsoodloo, Ghodousi, and Karimzadeh (2012) discovered individuals with a criminal history were more likely to have been additionally diagnosed with either a personality disorder and/or a substance abuse disorder. The diagnosis of schizophrenia also increased the presence of a criminal history among these same individuals (Maghsoodloo et al., 2012). Further consideration was not given to the significance of personality traits and violent behavior among those diagnosed with schizophrenia.

It is important to consider the personality traits among individuals diagnosed with schizophrenia, and how they are represented across various violent behaviors. In order to fill the gap found within previous research, the focus of this dissertation research was to examine the prevalence of the personality traits neuroticism, extraversion, openness, agreeableness, and conscientiousness as described in Costa and McCrae's (1992a) Five Factor Model (FFM) among individuals diagnosed with schizophrenia. One important factor with violence and criminal behavior is the concept of recidivism, or the returning of individuals to criminal behavior even after release. The findings of this research regarding the predictability can be utilized in addressing the question of recidivism in violence and crime among individuals diagnosed with schizophrenia. Additionally, the findings offer possibilities in designing treatment options around the personality aspects of individuals.

In the remainder of Chapter 1, current information regarding the relationship between schizophrenia, personality traits, and violent behavior are presented. Previous researchers have looked at two of the three concepts, but there remain limited findings on all three of the concepts. Within these research findings, the outcomes are discussed to further highlight the importance of being able to recognize potential risk factors for violent behavior. This information was also important due to the limited understanding of the criminal and violent behavior among people with schizophrenia.

The problem regarding schizophrenia, violent behavior, and personality traits, and why it is a major concern to understand and provide adequate diagnosis and recognition of the factors presented was addressed. In past studies, researchers did not consider how the variation in personality traits could exist among individuals with schizophrenia with the

same violent behavior history. The purpose of this research was to take these three factors and analyze the distribution of personality traits across the differing behaviors, and determine whether there was the presence of any type of relationship between these variables. Also, there was the aspiration to look at potential solutions or treatment options, which might aid in minimizing the recidivism of violence among individuals diagnosed with schizophrenia.

A quantitative research method was undertaken to examine the relationship between the proposed variables, the independent variable of personality traits and the dependent variable violent or nonviolent behavior. Although the participants were gathered from a secondary data source, the inclusion of a diagnosis of schizophrenia was required in order for the data to be considered usable within the research. Secondary data are not often considered the first and most desirable option for data collection; however, this method was selected in order to reduce the harm done to the protected populations. Supporting theories and previous research pertaining to schizophrenia, violent behavior, and personality traits served as the background.

Background

An association widely known and accepted is the presence of violence among individuals diagnosed with schizophrenia (Candini et al., 2015). The relationship between personality and criminal behavior is recognized as well (Candini et al., 2015). One aspect of personality has been described in various forms, with the FFM being one of the most prominently utilized models (Costa & McCrae, 1992a; Murdock et al., 2013). The five factors of personality traits are outlined and defined by the FFM, including neuroticism,

extraversion, openness, agreeableness, and conscientiousness, and were therefore utilized within this research (Costa & McCrae, 1992a). Although the FFM has been around for years, little consideration has been given to the model in regards to applying the factors to individuals diagnosed with schizophrenia and the presence of a violent behavioral history.

Researchers have recently demonstrated a limited amount of research on the areas of schizophrenia, violent behavior, and personality (Maghsoodloo et al., 2012; Ohi et al., 2016; Radovic & Hoglund, 2014). There have been relationships suggested and outlined regarding certain personality traits being present in individuals diagnosed with schizophrenia convicted of homicide, personality disorders and aggressive tendencies (Bo et al., 2013b), and the potential of committing a crime among individuals with schizophrenia based on their personality traits (Maghsoodloo et al., 2012). The presence of a link between personality pathology among individuals with violent histories, as well as those with schizophrenia, is lacking in the psychological research, which presented the need for such research.

Even though there has been extensive research done within the areas of schizophrenia, behavior, and personality, there are still many questions needing to be investigated. The lack of a cohesive study bringing all of the aforementioned elements together has still not been performed. Previous research has demonstrated a connection between criminal offenders and their impulsive behavior (Claes et al., 2014), violence among individuals diagnosed with schizophrenia (Fazel et al., 2014; Ghoreishi et al., 2015), and the ability of predicting aggression in schizophrenics when looking at the comorbidity of personality pathology (Bo et al., 2013a). Based on what is known from available

research, there was no research collectively combining these factors: the investigation of schizophrenia, violent and nonviolent behavior, and personality.

The violent behavior displayed among individuals diagnosed with schizophrenia is not thoroughly understood. The need for this study was apparent in the lack of research into the area of personality, violence, and the diagnosis of schizophrenia among individuals. The expectation of the research was to examine the presence of a relationship between these proposed variables. An additional desire from the research was the ability to assist with further diagnostic measures and direction into the violent behavior of schizophrenics when considering the inclusion of personality traits. Further understanding of violence in individuals with schizophrenia is also needed in order to combat the negative stereotypes underlying the diagnosis.

Problem Statement

Violent behavior is a problem affecting society as a whole, such as crime, and is thought to have recognizable aspects and potential benefits to both treatment and prevention. Many researchers have taken into consideration the relationship between personality, schizophrenia, and violent criminal behaviors (Bo et al., 2013c). Even though these three aspects have not been researched as extensively as other areas in psychology, the relationship between personality, schizophrenia, and violent criminal behaviors still offers a potential benefit in various areas of research and application (Radovic & Hoglund, 2014). Researchers have noted the importance of their findings in association with risk assessments, as well as in various identification processes (Witt, Lichtenstein, & Fazel, 2015).

There are five important aspects that have been established by previous research in the area of schizophrenia, personality traits, and violent behavior history. First, the connection between violence and psychotic disorders (including schizophrenia) is well known and established within the mental health community (Boyette et al., 2013; Radovic & Hoglund, 2014; Reagu, Jones, Kumari, & Taylor, 2013). Second, the risk of violent behavior increases with a comorbid diagnosis of antisocial personality disorder and substance abuse disorders among individuals diagnosed with schizophrenia (Bo et al., 2013b; Boyette, Nederlof, Meijer, Boer, & Haan, 2015; Bruce & Laporte, 2015; Dolan, O'Malley, & McGregor, 2013; Maghsoodloo et al., 2012). Third, without access to alcohol or illicit drugs, violent behavior is still present among those diagnosed with schizophrenia (Dolan et al., 2013). Fourth, personality traits have the potential of contributing to a psychotic individual's violent behavior (Riser & Kosson, 2013). Fifth, by using definitions provided by the FFM, substance abusers, individuals with schizophrenia, and those diagnosed with personality disorders have been assessed as being high in the personality trait neuroticism (Costa & McCrae, 1992a).

The presence of a connection between personality, schizophrenia, and violence is something known to researchers (Dolan et al., 2013; Ohi et al., 2012; Riser & Kosson, 2013). The extent of the relationship, or the distribution of personality traits among the spectrum of violent behaviors, however was not known. Bo et al. (2013a) found within their research a connection between the occurrence of aggression in people with schizophrenia and their personality pathology. This aggression could potentially be linked to criminal

behaviors, as suggested by Bo et al. (2013a) when they described personality disorders having an affect on behavioral outcomes related to aggression and violence.

Current research on schizophrenia and violent criminal behaviors focuses on the comorbidity of personality disorders, as suggested above. A number of studies have considered the presence of a personality disorder with the prominence of psychopathy (Bo et al., 2013b; Kamaluddin et al, 2015; Maghsoodloo et al., 2012; Riser & Kosson, 2013; Walsh, 2013). The results of the aforementioned studies focus only on the presence of comorbid psychopathy, without further consideration for the presence of other personality factors. These personality factors may hold important information regarding why some individuals with schizophrenia are more prone to violence and criminal behaviors than other individuals with schizophrenia without a criminal or violent background.

Multiple research studies have provided results demonstrating the relationship between psychopathy and schizophrenia (Baskin-Sommers, Baskin, Sommers, & Newman, 2013; Bo, Forth, Kongerslev, Haahr, Pedersen, & Simonsen, 2013c; Walsh & Yun, 2013). The results of these studies established the concept of schizophrenics having a higher potential of displaying violent behavior when compared to individuals who have not been diagnosed with schizophrenia. Another concern relates to those who have studied criminal behaviors among individuals diagnosed with schizophrenia, and having mainly focused on the presence of psychopathy or a personality disorder (Bo et al., 2013a; Imai, Hayashi, Shiina, Sakikawa, & Igarashi, 2014), while others consider a comorbidity of substance abuse as the primary cause (Dolan et al., 2013). Other research suggests an examination of

additional personality traits may hold additional and fundamental findings (O'Riordan & O'Connell, 2014; Scholte-Stalenhoef et al., 2016; Volavka, 2014).

Schizophrenia is of major concern due to the nature of the disorder. Walsh and Yun (2013) discussed how schizophrenia is extremely widespread throughout the world, and how its affects are not specific to one gender. With the presence of positive and negative symptoms, as well as subtypes of schizophrenia, Walsh and Yun (2013) found a further need to establish what is causing the elevated risk of schizophrenics behaving violently. Walsh and Yun (2013) further distinguished genetics as playing a major role in schizophrenia, but fall short of explaining the entire story of violence.

The application of the FFM to violent individuals diagnosed with schizophrenia is an area of study that has not been fully addressed (Costa & McCrae, 1992a). Studies, which have utilized the FFM among schizophrenics to determine the presence of the personality factors, have found more specifically high levels of neuroticism and low levels of extraversion (Boyette et al., 2013; Scholte-Stalenhoef et al., 2016). There are multiple personality traits, however, which influence those with schizophrenia. These personality traits may be considered risk factors towards violence with variation from individual to individual (Bo et al., 2013a; Scholte-Stalenhoef et al., 2016).

Purpose of the Study

This quantitative study was designed to examine the prevalence of the FFM personality traits within individuals who have been diagnosed with schizophrenia, while also examining a possible relationship with violent and nonviolent behaviors. Prior researchers have investigated the influence of substance abuse and other comorbid disorders on criminal

behavior in schizophrenics (El-Hadidy, 2012; Ghoreishi et al., 2015), but have not included the examination of personality traits and their relationship to the individual's violent or nonviolent behavior. The intent of this study was to identify the relationship between schizophrenia, personality traits, and displayed violent or nonviolent behaviors among the participants.

If the dependent variable, violent or nonviolent behavior, was predicted by the independent variables, personality traits, then further consideration was needed in looking at personality specific identification and diagnoses. However, if there was no relationship found, and personality traits did not influence the presence of violent behaviors, researchers would need to continue their search in finding appropriate measures to consider the reasons, appropriate diagnosis, and further research consideration among schizophrenics. If any type of relationship was not found among the variables, personality traits as a predictor will be eliminated within the education and diagnostic outcomes presented to schizophrenics.

Research Questions and Hypotheses

Research Question 1: What is the difference in neuroticism scores between individuals with schizophrenia having a history nonviolent and violent behavior?

Null Hypothesis ($H_0$1): There is no significant difference in neuroticism scores between individuals with schizophrenia who have demonstrated violent behavior compared to those with nonviolent behavior history.

Alternative Hypothesis (H_A1): There is a significant difference in neuroticism scores between individuals with schizophrenia who have a history of violent behavior compared to those with a nonviolent history.

Research Question 2: What is the difference in extraversion scores between individuals with schizophrenia who have a violent behavior history compared to those with a nonviolent history?

Null Hypothesis ($H_0$2): There is no significant difference in extraversion scores between individuals with schizophrenia who have demonstrated violent behavior and those who have a nonviolent history.

Alternative Hypothesis (H_A2): There is a significant difference in extraversion scores between individuals with schizophrenia who have demonstrated violent behavior and those who have a nonviolent history.

Research Question 3: What is the difference in conscientiousness scores between individuals with schizophrenia who have a history of violent behavior compared to those with a nonviolent history?

Null Hypothesis ($H_0$3): There is no significant difference in conscientiousness between violent and nonviolent individuals diagnosed with schizophrenia.

Alternative Hypothesis (H_A3): There is a significant difference in conscientiousness scores between individuals with schizophrenia who have a history of nonviolence compared to those who have a history of violent behavior.

Research Question 4: What is the difference in openness scores between individuals with schizophrenia having a violent behavior history compared to those with a nonviolent history?

Null Hypothesis ($H_0$4): There is no significant difference in levels of openness between violent and nonviolent individuals diagnosed with schizophrenia.

Alternative Hypothesis (H_A4): There is a significant difference in openness scores between individuals with schizophrenia who have a behavioral history of violence compared to individuals with a history of nonviolence.

Research Question 5**:** What is the difference in agreeableness scores between individuals with schizophrenia having a history of violence compared to those with no history of violence?

Null Hypothesis (H_05): There is no significant difference between nonviolent and violent individuals with schizophrenia when considering their level of agreeableness.

Alternative Hypothesis (H_A5): There is a significant difference in agreeableness scores between individuals with schizophrenia who have a history of violence when compared to those without a history of violence.

Research Question 6: What is the combined and relative effect of neuroticism, extraversion, conscientiousness, openness, and agreeableness in predicting violent versus nonviolent behaviors? Rather than testable hypotheses, this research question will be answered by a model-building approach (Jaccard & Jacoby, 2010).

Theoretical Framework for the Study

The theoretical framework for this study included Eysenck's (1967) theory of personality and crime. Because Eysenck (1967) addressed the aspect of personality influencing crime, his theory has been demonstrated and utilized by researchers to examine the relationship found between specific personality traits and an individual's violent criminal behavior. The utilization of this theory was ideal to this research due to the combination of both the behavior displayed, whether violent or nonviolent, and personality traits

theoretically having a relationship to each other. In addition to Eysenck's theory of personality and crime, another theory of personality, the FFM (Costa & McCrae, 1992a), was included.

Researchers have provided additional insight into the potential relationships between personality and other factors, such as schizophrenia and criminal behavior, by using the FFM (Costa & McCrae, 1992a). Murdock, Oddi, and Bridgett (2013) performed a research study inclusive of the FFM, in order to examine whether these personality traits could be linked to differing levels of executive functioning. Deficits in executive functioning are one of the symptoms of schizophrenia. The findings of Murdock et al. (2013) support the use of the FFM when considering links between executive functioning and personality traits, lending further credibility, reliability, and validity to Eysenck's (1967) theory of personality and crime, as well as the FFM (Costa & McCrae, 1992a).

Jolliffe (2013) explored the relationship between the FFM, social factors, and delinquency. Jolliffe (2013) suggests from his findings the FFM is beneficial in use due to its ability to translate across various languages. Jolliffe (2013) also found a difference between the personality traits of male delinquents and female delinquents. Although this was not an area of concern within the performed research, the fact that violence among females with schizophrenia is more prevalent than in males, might also need to be considered (Fleischman, Weberloff, Yoffe, Davidson, & Weiser, 2014). Further information on the FFM and theory of personality and crime is provided within Chapter 2, as well as other theories and research pertaining to the relationship of schizophrenia, crime/violence, and personality.

Nature of the Study

The method selected for this study was the quantitative method, with the use of separate univariate approaches to data analysis to perform this research. Quantitative research allows for the examination of a relationship between the proposed variables. The variables examined within this performed research study included personality traits related to the presence and type of behavior, violent vs. nonviolent, among individuals who have been diagnosed with schizophrenia. These variables aligned with the examination of the prevalence of personality traits among individuals diagnosed with schizophrenia, with a background of violent behavior compared to nonviolent. Further consideration was given to the age, gender, and race of the individuals within the research data. These were not identified as variables, but were recognized and noted if provided within the data.

The measurement of these aforementioned variables was dependent on the secondary research data made available pertaining to the desired variables. There were multiple measures that could have been utilized; one measurement often used to look at personality is the Neuroticism Extraversion Openness – Personality Inventory Revised (NEO-PI-R; Costa & McCrae, 1992a) or the NEO-Five Factor Inventory (NEO-FFI; Costa & McCrae, 1992a) in order to determine the presence of personality traits. The NEO-PI-R assessment is one of the more commonly utilized tools to look at the personality traits within the FFM. The NEO-FFI is a shortened version of the NEO-PI-R, and was the personality inventory utilized by Ohi, Shimada, and Kawasaki (2015), the researchers of the data set utilized within this research study.

Eysenck's (1967) theory of personality and crime, in addition to the FFM (Costa & McCrae, 1992a), corresponded with the main focus of this dissertation topic. The quantitative research and analysis performed helped demonstrate the relationship between personality traits and violent behavior among individuals diagnosed with schizophrenia. Additionally, the identification of the most abundant personality traits among schizophrenic individuals possessing a history of violent behavior was found. With this identification, there are numerous possibilities in applying the findings to violent and nonviolent criminals with schizophrenia, especially when considering their risk of future violence and treatment.

Definitions

Aggression is defined as a particular behavior in which a person intends to do harm directed towards others, and which behavior would motivate the individual to avoid (Darrell-Berry, Berry, & Bucci; 2016).

Agreeableness (A) is the personality dimension that considers the interpersonal behavior of individuals. For example, individuals whom are found to have low agreeableness are more likely to be cynical, callous, and antagonistic (Costa & McCrae, 1992b). Hosie, Gilbert, Simpson, and Daffern (2014) further defined agreeableness as a person's willingness to help and please others.

Conscientiousness (C) is a dimension of the FFM, which "contrasts scrupulous, well-organized, and diligent people with lax, disorganized, and lackadaisical individuals" (Costa & McCrae, 1992b). Hosie et al. (2014) added to the definition of conscientiousness, describing it as a person's control of their impulsivity.

Extraversion (E) is the second factor added to the original FFM. Extraversion examines a broad group of traits, including a person's activity and sociability, as well as their "tendency to experience positive emotions such as joy and pleasure" (Costa & McCrae, 1992b).

Five Factor Model (FFM) is a model defining the personality structure of individuals considering the factors of neuroticism, extraversion, openness, agreeableness, and conscientiousness (Costa & McCrae, 1992a).

Impulsive (reactive) aggression is defined as a type of aggression that is impulsive, unplanned, and emotionally driven in nature (Bo et al., 2013c). This type is also referred to as reactive due to a person's inability to control themselves, or are disinhibited (Bobadilla, Wampler, Taylor, 2012).

Neuroticism (N) is the first factor within the FFM, which considers an individual's tendency to experience psychological distress (Costa & McCrae, 1992b). It is further defined as an experience of negative in both mood and emotion, including anxiety and low self-esteem (Tackett & Krueger, 2011).

Neuroticism Extraversion Openness – Five Factor Inventory (NEO-FFI) is a shortened version of the Neuroticism Extraversion Openness – Personality Inventory – Revised (NEO-PI-R) and consists of 60 items to measure the five basic personality factors originally defined by Costa and McCrae (1992c). The 60 items consist of 12 items from each scale, selected from the main pool established from the 180 Neuroticism Extraversion Openness – Personality Inventory (NEO-PI) items. Second to the NEO-PI-R, the NEO-FFI

is "one of the most widely used measures of the Five-Factor Model (McCrae & Costa, 2004).

Neuroticism Extraversion Openness – Personality Inventory - Revised (NEO-PI-R) is a revised questionnaire developed to measure the five-factor model and "assesses all five factors of personality at two levels: each of the factors is defined by six scales measuring specific traits" (Costa & McCrae, 1992a, p. 350). The Neuroticism Extraversion Openness – Personality Inventory (NEO-PI) was the first inventory specifically based on the FFM; with the NEO-PI-R being the revised version to come later (Costa & McCrae, 1992c).

Openness to Experience (O) is the personality factor that considers a person's imagination and sensitivity to developing a complex, emotional life (Costa & McCrae, 1992b). Tackett and Krueger (2011) added the idea of imagination and fantasy as a key factor of openness to experience.

Personality traits "dimensions of individual differences in tendencies to show consistent patterns of thoughts, feelings, and actions" (McCrae & Costa, 1990, p. 23). Tackett and Krueger (2011) described personality traits as a factor used when predicting future behavior, factors which are viewed as enduring and pervasive.

Premeditated aggression is the type of aggression, which an individual has planned, is goal-oriented, and cold-blooded (Bo et al., 2013c; Bobadilla et al., 2012). Because it is considered to be a more severe form of aggression, it is more difficult to treat in comparison to the other subtype, impulsive aggression (Bo et al., 2013c). It is also believed this type of aggression is a better predictor of criminal recidivism (Bo et al., 2013c).

Violence is defined by Darrell-Berry et al. (2016) as a type of aggression in which extreme harm is the intended outcome or goal. Dr. Ohi and his colleagues took this definition a step further and considered violence to be an act between people, and excluded any violence against property.

Assumptions

For the purpose of this study, there were multiple assumptions to consider. The first assumption regarded the diagnosis of schizophrenia being made by a professional and in accordance to the Diagnostic and Statistical Manual of Mental Disorders fourth edition, text revision (DSM-IV-TR; American Psychiatric Association, 2000) or the fifth edition of the same manual (APA, 2013) guidelines. Both sets of criteria were considered in the diagnosis of schizophrenia. The use of both sets of criteria allowed for further examination of the time at which the participants were diagnosed, and which version of the DSM had been utilized in the diagnosis.

The second assumption related to the knowledge and willingness of the participants within the selected data set. Considering this assumption, it was assumed the participants were given full disclosure and information regarding the original study, and willingly accepted to participate. A third assumption pertained to the truthfulness of the answers provided by the participants. Those answers given within the NEO-FFI, as well as the answers regarding a participant's violent behavior history, were assumed to be truthful and an accurate representation.

The aforementioned assumptions were important in being able to utilize the findings towards a general schizophrenic population. With the first assumption, the diagnosis of

schizophrenia must have been reached in an appropriate way, and with the use of the same set of factors. The second assumption pertaining to the willingness and awareness of the participants was important to consider. Since this research utilized secondary data, one could only assume the results were obtained using ethical standards, which allowed the participants to willingly participate with full understanding. There was also the assumption the participants answered truthfully to all of the questions being asked within any interview or assessment process within the third assumption.

Scope and Delimitations

The scope of this research included individuals diagnosed with schizophrenia and their varying aspects of nonviolent and violent behavior. Prior research has considered the presence of personality disorders among those diagnosed with schizophrenia (Moore, Green, & Carr, 2012). The focus of this research was on the specific personality traits, as described within the FFM, and explored the trait distribution between the violent behaviors exhibited by the participants. The reported violent behaviors were only considered when provided within actual legal documents and self-report.

The comorbidity of personality disorders and schizophrenia has also been found to impact the criminal outcomes of individuals (Furukawa, 2015; Maghsoodloo et al., 2012). Furthermore, the presence of substance disorders among schizophrenics, influences their risk of violence (Radovic & Hoglund, 2014; Ural, Oncu, Belli, & Soysal, 2013). These comorbidities were not considered or used within the scope of this research. The reason was due to a desire to look closer at specific personality traits instead of the presence of another diagnosable disorder.

Limitations

Due to the nature of this study and the use of secondary data, the intellectual performance of the participants may have not been considered when the original data was gathered. Langeveld et al. (2014) suggest this may be a potential problem due to research finding a negative correlation between intellectual performance and the trait neuroticism. Data was examined for the inclusion of intellectual consideration in order to reduce this problem. Only those research studies including intellectual capacity were included in the performed data analysis.

Another limitation considered was regarding the criteria used in the diagnosis of schizophrenia within the participants. The consideration of only those individuals having been diagnosed using either the DSM-IV-TR, or the DSM-5, the source of participants may be limited. However, since there have been considerable differences from the first published DSM, the utilization of the most appropriate and current diagnostic criteria was preferred. The use of the most current diagnostic criteria was beneficial in the ability to generalize the findings of this research to the target population.

Significance

The FFM was utilized to examine how these specific personality factors play a role in the violent behavior displayed by individuals diagnosed with schizophrenia. The findings in the prevalence of traits allowed for further investigation in why one personality factor or trait is more numerous in schizophrenics displaying violent behavior as opposed to those who are less violent. There was also the underlying factor of personality playing a crucial role, with the understanding of those with schizophrenia already being more prone to

displaying violent behavior. Research suggests there might be different subtypes of personality leading individuals down distinctive pathways of criminal offending and violent behavior (Claes et al., 2014).

The data gathered and analyzed was expected to demonstrate a relationship between personality traits and the varying levels of violent and nonviolent behavior, in addition to activity in people who are diagnosed with schizophrenia. Empirical evidence from this study has the potential to aid psychology professionals in performing risk assessments (Witt, Lichtenstein, & Fazel, 2015), as well as developing outlined treatment plans. Information regarding the treatment of individuals with schizophrenia is essential, as almost 1% of individuals are diagnosed with this mental disorder (Newton-Howes & Marsh, 2013).

Significant research studies regarding schizophrenia, violence, criminal behavior, and personality disorders have been performed. However, there are still data missing which are inclusive of the more commonly displayed personality traits in correlation to the crimes committed and violence displayed. The findings of this research offer further benefit to individuals within society, even if they have not been diagnosed with schizophrenia. Even though there has not been a recognized way of treating personality traits, the suggestion of being able to perform assessments, which lead to identification of potentially troublesome behaviors, might be beneficial. The ability to identify those individuals, who are at increased risk of criminal or violent behavior, has the possibility of guiding further research in the field. The findings of this research may potentially provide the much-desired understanding of the relationship between schizophrenia and violent behavior, as it directly relates to personality.

Summary

Examining the personality traits within individuals diagnosed with schizophrenia was only one aspect of the performed research. Further consideration was given to how those personality traits are related to the displayed violent behavior among those diagnosed with schizophrenia. Within Chapter 1, an introduction to this study was provided, as well as substantial background information regarding schizophrenia, personality traits using the FFM, and violent behavior. The presence of personality disorders among violent schizophrenics has continually been proven, but the specific personality traits within the FFM have not been utilized when considering the association between those examined and their displayed violent or nonviolent behavior. The use of both Eysenck's (1967) theory of crime and personality, as well as Costa and McCrae's (1992a) FFM, may provide further direction into developing various plans for treatment and recognized diagnostic measures. The direction and recognition may prove to be beneficial to the field.

Personality traits have been a focus of an individual's behavior history since the development of the FFM. The purpose of this study was to focus on how these personality traits are spread across the schizophrenic population, and how they relate to the individuals violent behaviors. The findings of personality traits having an influence on violent behavior is something researchers can use to give guidance to further recognition, appropriate diagnosis, and treatment to those individuals whom the findings can be generalized.

In Chapter 2, there is a review of the current research associated with this study. This review includes articles from peer reviewed scientific journals, which have been published within five years of this proposal. Theoretical bases and possibility of research

weaknesses, when considering personality traits and criminal behavior, is also presented. Using Eysenck's theory of personality and crime, as well as the FFM introduced by Costa and McCrae (1992a), the evolving theoretical framework consisted of only the desired aspects, the personality traits of an individual diagnosed with schizophrenia and the presence of displayed violent or nonviolent behavior.

Chapter 2: Literature Review

Introduction

Previous researchers have suggested individuals diagnosed with a psychotic disorder, including schizophrenia, are more prone to aggressive behaviors (Nederlof, Muris, & Hovens, 2014; Radovic & Hoglund, 2014). Although this belief is based on truth, the continued idea of all people with schizophrenia are aggressive continues to portray those with a mental illness in a negative way. Further research has provided other ideas as to what contributes to these aggressive tendencies, and examined why individuals with psychotic disorders may be more prone to violence (Bragado-Jimenez & Taylor, 2012). It is a well-established fact individuals diagnosed with schizophrenia are at greater risk of displaying violent behaviors when compared to those without the diagnosis (Bo et al., 2013b). However, even though this connection has been found, there is still significant debate surrounding what type of relationship exists between schizophrenia and violence (Bo et al., 2013b).

There have been various suggestions regarding what is influential to those with schizophrenia when it comes to violence. Researchers have provided numerous ideas, including a person's sex and race (Baskin-Sommers et al., 2013) as a contributing factor, as well as emotional capabilities among people with schizophrenia (Bragado-Jimenez & Taylor, 2012). Extensive research has also been conducted examining the existence of comorbid personality disorders and substance abuse problems among individuals with schizophrenia (Bo et al., 2013a; Bo et al., 2013b; Haddock et al., 2013; Radovic & Hoglund, 2014). Researchers have also found a connection between schizophrenia and violence, but

have failed to examine how the presence of certain personality traits may play a role in this violence (Bo et al., 2013b).

Current research is presented within this chapter, which is inclusive of the theoretical framework of Costa and McCrae's (1990) FFM of personality. When determining which key variables to include in this research, consideration was given to the seminal works of Eysenck (1967), as well as Costa and McCrae (1990). These theories focus on personality, with Eysenck's theory centered on personality and crime, while Costa and McCrae described personality in the form of five specific traits. Reasons for using these theories in application to personality traits among individuals diagnosed with schizophrenia, and how these traits are related to their displayed behaviors, will be presented.

Literature Search Strategy

Limited research has been performed that gathers information regarding people diagnosed with schizophrenia, and how their personality traits are related to their displayed violent behavior. Criminal behavior, and personality traits, databases were chosen in order to gather relevant information regarding schizophrenia, which would include research articles pertaining to the aforementioned factors. The following is a list of these databases and search engines utilized in the acquiring of information: EBSCO ebooks, EBSCOhost, Google Books, Google Scholar, ProQuest Central, PsycARTICLES, PsycBOOKS, PsycINFO, SAGE Premier, SAGE Research Methods Online, Science Direct, SocINDEX with Full Text, Research Gate.

Search terms and the combination of search terms used for research, are as follows: *schizophrenia, schizophrenia and personality, personality disorders, aggression and*

schizophrenia, psychotic disorder and schizophrenia, psychotic disorder and personality traits, five factor model of personality, antisocial personality disorder, conduct disorder, schizophrenia and crime, criminal behavior, personality traits and criminal behavior, violent behavior and schizophrenia, violent behavior and personality, mental illness and violence, schizophrenia and violence, NEO five factor inventory, personality traits and schizophrenia, executive functioning and schizophrenia, delusions and aggression, personality traits, personality and violence, functioning and schizophrenia, functioning and criminal behavior, big five personality model, genetics and criminal behavior, violent offenders, recidivism and schizophrenia, mental disorders and crime, psychosis and aggression, psychosis and violence, risk assessment of schizophrenia, Eysenck's theory of crime and personality.

The search results were narrowed down to peer-reviewed journals and published research from 2012 to present, in order to be considered for the literature review. The only exception is the inclusion of seminal works dating from 1964, 1990, and 1992. This approach to the review also included data sets gathered from individuals diagnosed with schizophrenia prior to the research, the assessment of their personality traits, as well as a description of their criminal and violence history. There has been limited research done which examines the three variables of personality traits, violent or criminal behavior, and schizophrenia, research articles have only focused on two of the three variables were also included in the literature review.

Theoretical Foundation

Costa and McCrae's (1990) FFM of personality includes the distinction between five identified personality traits: neuroticism, extraversion, openness, conscientiousness, and agreeableness. Each of these factors is believed to have some bearing on the way in which a person behaves, feels, and thinks (Costa & McCrae, 1992a). Due to the widely accepted notion of personality being made of basic dimensions, Costa and McCrae's description and naming of these dimensions allows for further consideration in how these personality traits influence an individual's behavior.

The second theory utilized within this research is Eysenck's theory of crime and personality, as described in his book *Crime and Personality*, published in 1964. Eysenck described the presence of three important personality dimensions within this theory, including extraversion, neuroticism, and psychoticism. Similar to the five factors established later by Costa and McCrae (1990), Eysenck's personality dimensions are further examined in relation to the displayed criminal behaviors (1964). The basis of Eysenck's theory involves the concept of criminal behavior being linked to personality through various socialization processes (Eysenck, 1967). Ultimately, Eysenck suggested that varying combinations of personality traits would determine the type of criminal behavior an individual displays.

Neuroticism. The personality factor of neuroticism is considered to be a trait, which contributes to a person's ability and reaction to various stimuli (Eysenck, 1967). Costa and McCrae (1990) further described individuals high in neuroticism as temperamental, displaying strong emotions, and worrisome. Both Eysenck (1967) and Costa and McCrae

(1990) felt individuals high in the factor of neuroticism were more likely to suffer from anxiety, as well as depression, displaying instability in their emotional integrity.

Extraversion. The factor of extraversion includes the examination of the concept of socialization and a person's ability to interact with others. Costa and McCrae (1992a) described extraversion in the context of someone who is able to be active in social settings, display willingness to join in group activities, as well as display warmth and other positive emotions when around others. Eysenck (1967) described extraversion in a similar context. He designated an individual who presented with high extraversion were more likely to be social and sensation seeking, compared to those individuals with low extraversion (Eysenck, 1964).

Psychoticism. Although Costa and McCrae (1990) did not include a personality factor with the name *psychoticism*, Eysenck (1967) felt this concept was important when examining the criminal behavior of individuals. Psychoticism has multiple aspects to it, including the consideration of aggressiveness and level of antisocial behavior (Eysenck, 1967). Eysenck (1967) believed, and expressed within his theory of personality and crime, that individuals displaying higher levels of psychoticism would be more aggressive, egocentric, and antisocial. This concept further supported Eysenck's idea of criminal behavior being influenced by a person's ability or inability to effectively function in social settings.

Openness. Costa and McCrae's third personality factor relates to the people's interests in new activities and their present culture (Widiger & Costa, 2013). A person's creativity and curiosity are examined within this factor. For example, in the openness to

experience factor, individuals high in openness are described as being creative, curious, and liberal (Costa & McCrae, 1992a). Additionally, Costa and McCrae felt this personality factor would provide further insight into a person's intellect and feelings regarding the various aspects of culture (1992a).

Agreeableness. The fourth personality factor Costa and McCrae (1990) describe in their five factor model is agreeableness. This factor encompasses an individual's ability to have interpersonal relationships (Widiger & Costa, 2013). Individuals high on agreeableness are considered trustworthy, generous, and good-natured (Costa & McCrae, 1992a). Furthermore, Trull (2012) attributed the personality trait of agreeableness to be in competition with a person's desire to be antagonistic.

Conscientiousness. The final factor in the five-factor model of personality is conscientiousness. Costa and McCrae (1992a) described conscientiousness as relating to a person's level of self-control, competence, and ability to plan and organize (Widiger & Costa, 2013). An individual considered high in conscientiousness is described as being ambitious, persevering, and hardworking (Costa & McCrae, 1992a).

Examples of Previously Applied Theory

Boduszek et al. (2013) performed a research study in which they applied Eysenck's (1967) theory of personality and crime to a group of violent and nonviolent criminal offenders. The researchers investigated exactly how personality traits can influence and impact the criminal thinking style of various criminal offenders (Boduszek et al., 2013). Considering Eysenck's belief that criminals would score high on all three of the personality dimensions described (psychoticism, neuroticism, and extraversion), Boduszek et al. (2013)

looked to determine which dimension was significant in the prediction of criminal behavior. They found all three dimensions significantly contributed to the variation in criminal thinking style (Boduszek et al., 2013). Their results further demonstrated the concept of personality traits being able to predict the deviant thinking found among individuals displaying persistent criminal behaviors (Boduszek et al., 2013).

A more recent research study examined the ability to predict the involvement in criminal activity within an adult population by using personality measures. O'Riordan and O'Connell (2014) included socio-economic measures, in addition to the factors within the FFM, to determine which was more effective, as a predictor of crime among individuals. O'Riordan and O'Connell (2014) found that although gender and school troubles during teenage years were able to predict criminal involvement, levels of extraversion, neuroticism, and agreeableness were better at predicting this behavior. The researchers also found within the results of the study how individuals involved in crime had higher levels of extraversion and neuroticism, in addition to lower levels of agreeableness, supporting the findings from previous research studies (O'Riordan & O'Connell, 2014).

Rationale for Choice of Theory

Eysenck's theory of personality and crime (1967), as well as Costa and McCrae's FFM (1990), address the personality traits found among individuals. The use of Eysenck's theory provides the groundwork for the idea of crime being a result of the personality traits a person possesses, while the FFM identifies five universally accepted personality traits found across various cultures. Even though Eysenck's theory only has three traits, it is believed

the FFM traits of agreeableness and conscientiousness are essentially combined together to make the Eysenck personality trait of psychoticism (Hosie et al., 2014).

The FFM was utilized due to it being considered an ideal model of personality for its inclusion of differences in the emotional, interpersonal, experiential, attitudinal, and motivational styles found among individuals (Costa & McCrae, 1992a). Also, the FFM is universal and has been reported in such populations as children, college students, older adults, men and women, as well as White and non-White individuals (Costa & McCrae, 1992a). The described universality and wide acceptance of the FFM and Eysenck's theory of crime and personality allowed for the utilization of the ideals and applying them appropriately within this research.

Theory and Research Study Relationship

This research study involved the examination of connections between schizophrenia, personality traits, and criminal behavior. Although the described theories do not directly address a population diagnosed with a mental health disorder, Boyette et al. (2013) determined the FFM was an accurate model to use when looking at the personality traits of psychotic individuals due to multiple relevant reasons. Boyette et al. (2013) found the traits within the FFM may contribute to the development of the disorder, as well as influencing the course of the illness. These reasons do not necessarily relate to the research questions, but the findings of Boyette et al. (2013) research suggests applicability of the FFM to the desired population.

Considering individuals with schizophrenia, the research questions addressed each of the five factors of personality traits within the FFM. The examination of each factor has

helped determine what combination of each factor is present in individuals with violent or nonviolent behavior history. The first and second research questions addressed the level of neuroticism and extraversion found among people with schizophrenia, and how it related to their history of violence. O'Riordan and O'Connell (2014) found criminals to be higher in both traits when considering both the level of neuroticism and extraversion in criminals, demonstrating a difference in extraversion between schizophrenic individuals and non-schizophrenic criminals.

The third and fifth research questions pertained to the level of agreeableness and conscientiousness in schizophrenics in relation to their violent or nonviolent behavior history. Boyette et al. (2013) found individuals with schizophrenia were lower in both agreeableness and conscientiousness when compared to healthy populations. Similarly, O'Riordan and O'Connell (2014) determined adults convicted of crime also demonstrated lower levels of agreeableness and conscientiousness in comparison to control populations. A significant difference between the results of this research study and those of already published research was not suspected due to these results being in agreement.

The fourth research question related to the openness factor in the FFM. There was no significant difference when examining openness in the schizophrenic population, as well as the adult criminal population (Boyette et al., 2013; O'Riordan & O'Connell, 2014). Even though significant differences within the factor of openness have not been found, by looking at criminal and noncriminal schizophrenics, there was the potential of finding differences having not been discovered before. Depending on the findings, the results of this study

might either support previous research findings or build upon the theories, or they will challenge the results and theories.

Literature Review Related to Key Variables

According to the FFM, there are five factors of personality traits recognized as being found among various populations (Costa & McCrae, 1990). Researchers are able to determine whether there is a connection between the level of personality and the displayed behavior by examining each factor. The observation of a possible connection was expected within the results of this study. Researchers have not performed studies, which incorporate the diagnosis of schizophrenia, the displayed personality traits, and the violent behavior history of the participants, as previously mentioned. The variables of this research study were examined further in the following subsections, by comparing research articles published. Each subsection includes at least two of the proposed variables of this study. Looking at various articles related to the research study provided further rationale as to why the variables were selected.

Schizophrenia and Personality

Multiple researchers have addressed the idea of a relationship between schizophrenia and personality over the years. Schroeder et al. (2012) performed a research study examining the relationship between schizophrenia and personality diagnostics. The researchers had concerns of an individual being diagnosed with a schizophrenia spectrum disorder may be improperly diagnosed with a personality disorder due to psychopathological overlap (Schroeder et al., 2012). They suggest this overlap can influence or bias a personality disorder diagnosis, but with the results of their study were unable to determine

the extent of the correlations originally introduced (Schroeder et al., 2012). Schroeder et al. (2012) research findings support the need for further understanding of the relationship between the maladaptive personality traits found among schizophrenics and those with diagnosable personality disorders.

Newton-Howes and Marsh (2013) further considered the relationship between schizophrenia and personality dysfunction by looking at social functioning. The results found by Newton-Howes and Marsh (2013) was a correlation between poor social functioning and the finding of personality dysfunctions. Even though the researchers did not look at specific personality traits, the findings of deficits in social functioning among individuals diagnosed with schizophrenia presenting with personality dysfunctions are significant when looking towards future research and decision making in clinical settings (Newton-Howes & Marsh, 2013). These findings are further supportive of the previous research performed by Schroeder et al. (2012).

Boyette et al. (2013) examined a different aspect of how personality can affect individuals diagnosed with schizophrenia. Boyette et al. (2013) studied the connection between the FFM personality traits and psychotic disorders. Boyette et al. (2013) hoped to find the associations between personality traits and psychosis by comparing patients with psychotic disorders with their siblings and control subjects. These researchers found a significant difference in four out of five of the FFM traits (all except openness) between patients with a psychotic disorder and their siblings (Boyette et al., 2013). The conclusion of Boyette et al. (2013) was the greater the level of neuroticism, the risk for psychosis

increased among individuals with a family member who had been diagnosed with schizophrenia or another psychotic disorder.

The diagnosis of schizophrenia has certain side effects presented among individuals diagnosed with the disorder; one such side effect is cognitive impairment (Murdock et al., 2013). Murdock et al. (2013) looked to determine what the connection between executive functioning and personality traits might be present. Murdock et al. (2013) identified a lack of research performed on two of the personality factors of the FFM, agreeableness and conscientiousness. The researchers were hoping to find connections between each aspect of executive functioning and the personality factors in the FFM (Murdock et al., 2013). The results of Murdock et al. (2013) study suggest the personality traits of neuroticism and openness were significantly predicted by certain executive functions, such as updating and monitoring cognitive functions.

Another common research approach involves looking at personality disorders and how they may interact with other mental illnesses. Previous research has shown individuals with a psychotic disorder are three times more likely to be diagnosed with a personality disorder (Moore et al., 2012). Moore et al. (2012) performed a study in order to further explore how personality disorders could influence or impact the presence of psychosis found among individuals with schizophrenia. Their results further supported the previously reported findings, such that Moore et al. (2012) results showed individuals with schizophrenia are more than eight times more likely to have a personality disorder.

Callaway, Cohen, Matthews, and Dinzeo (2014) considered the relationship between certain personality disorders with schizotypy personality traits and the development of

schizophrenia among individuals. Callaway et al. (2014) developed an assessment tool with their research, which allows for the testing and detection of the schizotypy specific traits that are believed to lead to schizophrenia. Callaway et al. (2014) found the Schizotypal Personality Questionnaire – Brief Revised (SPQ-BR) was able to provide strong internal reliability of scores on the scale. While this study does not include the personality traits within the FFM, Callaway et al. (2014) research provides further insight into the concept of personality having influence and presence of a relationship with schizophrenia.

An additional aspect researched regarding schizophrenia and personality was the concept of self-identity. Boulanger et al. (2013) emphasized the idea of individuals diagnosed with schizophrenia having identity disturbances, such as a loss of understanding or acknowledgement of self. Boulanger et al. (2013) suggested there were personality traits that could be measured in order to determine whether these individuals experienced an altered recognition of who they were. The findings supported the hypothesis of Boulanger et al. (2013), in which individuals with schizophrenia who presented with an unstable concept of their own identity, although it was a weaker result than anticipated.

Another examination into the difference of personality traits among individuals with schizophrenia is the research performed by Miralles et al. (2014). The main focus of the research performed by Miralles et al. (2014) is gender differences in displayed personality traits and illness severity of persons diagnosed with schizophrenia. Miralles et al. (2014) highlighted the importance of personality among the diagnosis of schizophrenia, due to personality influencing expression of symptoms, cognitive and social functioning of the individual, and a possible early presentation of the disorder. Miralles et al. (2014)

discovered was a positive correlation of psychiatric hospital admissions and the score of novelty seeking in males, while being negatively correlated with self-directedness in females. Miralles et al. (2014) considered the severity of illness and concluded this was related to certain personality dimensions within each gender.

Researchers Fagerberg, Soderman, Gustavsson, Agartz, and Jonsson (2016) executed research into the usability of differences among personality traits within individuals diagnosed with schizophrenia. They utilized the Swedish universities Scales of Personality (SSP) to examine this potential usability. The results of the research study consisted of individuals diagnosed with a psychotic disorder receiving higher scores among the somatic trait anxiety, lack of assertiveness, and inverse detachment, areas reflected in the personality assessments of NEO-FFI, NEO-PI, and NEO-PI-R neuroticism score (Fagerberg et al., 2016). By examining the results of their study using SSP against those of the NEO assessments, Fagerberg et al. (2016) were able to determine their findings as being substantially consistent in comparison.

Ohi et al. (2016) performed a very recent meta-analysis looking at the personality traits within individuals diagnosed with schizophrenia. Their research took into consideration 460 patients with schizophrenia and 486 healthy subjects gathered from published literature (Ohi et al., 2016). These researchers utilized the NEO-FFI to measure the personality dimensions of the participants. Just as previous research findings have suggested, those individuals diagnosed with schizophrenia represented higher scores for neuroticism while demonstrating lower scores for extraversion, openness, agreeableness, and conscientiousness (Ohi et al., 2016). Ohi et al. (2016) determined personality is an

important factor to consider in individuals with schizophrenia, as it has an affect on the symptoms, cognition, and social functioning of those diagnosed.

Although these aforementioned studies do not address every variable described in this research study, each research article is beneficial in demonstrating how personality can impact schizophrenia. Scholte-Stalenhoef et al. (2016) determined there was an observable relationship between schizophrenia and personality, further supporting the findings of Lonnqvist et al. (2009) and Andersen and Bienvenu (2011). Boyette et al. (2013) described the risk of psychosis increasing the higher the levels of assessed neuroticism among individuals with a family history of a psychotic disorder. Research by Murdock et al. (2013) had results showing how two of the FFM personality traits had impact on the executive functioning of participants with schizophrenia. Moore et al. (2012) research study demonstrated the influence a personality disorder can have among individuals diagnosed with schizophrenia.

Schizophrenia, Criminal Behavior, Aggression, and Violence

There has long been the idea of individuals with mental disorders are more violent and criminal when compared to the general population. Reagu et al. (2013) performed a meta-analysis of previous research articles, which considered the relationship between anger and violence among individuals diagnosed with schizophrenia. Reagu et al. (2013) found within all of the studies, a significantly higher score of anger among individuals diagnosed with schizophrenia. The researchers described these results as further supporting previous findings and suggestions of a significant association between angry affect and violent behavior within a population of individuals with a psychotic illness (Reagu et al., 2013).

Richard-Devantoy et al. (2016) found similar findings among their research of epidemiological studies. These research studies provided Richard-Devantoy et al. (2016) with an estimate of 6%-15% of murderers being found to have been suffering from a major mental disorder, including schizophrenia.

Looking further into the relationship between persons with schizophrenia and their criminal behavior, McCabe et al. (2012) performed a study considering the prevalence of arrest types. McCabe et al. (2012) found within their results a demonstration of individuals with a major psychotic illness, such as schizophrenia, were at greater risk of being arrested for various offenses if they had a comorbid diagnosis of antisocial personality disorder or a substance use disorder. These results support previous research by Dumais et al. (2011) and Eriksson, Romelsjö, Stenbacka, and Tengström (2011), and gives further support to future research findings by Short, Thomas, Mullen, and Ogloff (2013).

Heinrichs and Sam (2012) performed a study addressing the relationship between crime and schizophrenia, and how this relationship allowed for prediction of violence. The 151 participants of this research study had been diagnosed in accordance with the DSM-IV criteria for either schizophrenia or schizoaffective disorders (Heinrichs & Sam, 2012). Heinrichs and Sam (2012) were able to find variables, such as employment status, education, and substance usage, which were correlated to future charges of violent crime. Additionally, Heinrichs and Sam (2012) found certain predictors were associated with criminal activity, including paranoia, depression, and low energy. The results of this study support Heinrichs and Sam's (2012) hypothesis of there being certain variables and

predictors present among individuals with schizophrenia when looking at criminal charges and violence.

Steinert and Whittington (2013) considered the interaction between a psychiatric diagnosis and the influential factors of violence within this mentally ill population. The main goal of this research pertained to the examination of the various biological, psychological, and social factors, which may present as key in relation to the violence displayed among the mentally ill (Steinert & Whittington, 2013). The researchers suggested possible benefits to the research as being inclusive of developing models of violence for the mentally disordered individuals (Steinert & Whittington, 2013). Steinert and Whittington (2013) concluded the development of models of violence might be beneficial for professionals to have a more comprehensive understanding of the influential factors regarding violence within a given population, such as individuals with schizophrenia.

Dack, Ross, Papadopoulos, Stewart, and Bowers (2013) performed a study investigating the relationship between diagnosed schizophrenia and various factors associated with aggression levels of patients in an inpatient facility. The focus of this study was to determine the level of association between aggression and patient factors, such as previous hospitalizations and level of admission (Dack et al., 2013). The results of their meta-analysis showed individuals were more likely to be aggressive during their hospital stay if they were younger, male, involuntarily admitted, have a diagnosis of schizophrenia, and a history of violence (Dack et al., 2013). Although Dack et al. (2013) determined these factors were common predictors of aggressive behavior, prior research estimates found that between 8% and 44% of patients admitted to acute psychiatric wards were aggressive. This

figure suggests there may be other factors to consider when determining an individual's risk of violence.

Additional research was performed by Nederlof et al. (2014), which looked into how aggressive tendencies within a non-clinical sample were influenced by various mood states. While this research did not look directly at the presence of schizophrenia within their sample population, Nederlof et al. (2014) did address some of the common symptoms found among individuals with schizophrenia, including feelings of persecution, hallucinations, and delusions. Nederlof et al. (2014) considered how these symptoms related to the expression of aggressive attitudes, finding a significant link to feelings of persecution. Findings also suggest individuals will have a higher aggressive attitude if they are found to be anxious compared to those in a more neutral mood (Nederlof et al., 2014).

Edlinger et al. (2014) took into consideration the risk of violence and display of aggressive behavior among patients in an inpatient unit in Austria. Researchers Edlinger et al. (2014) described a common risk factor among schizophrenics as being a history of violent behavior. They also believed this history might contribute to the greater rate of violence among individuals diagnosed with schizophrenia (Edlinger et al., 2014). The findings of Edlinger et al. (2014) research provide additional support regarding people with schizophrenia having a greater lifetime risk of violence and aggressive behavior, with the greatest risk being among those individuals with a comorbid substance abuse or personality disorder. Findings similar to these results have been previously reported (Fleischman et al., 2014; Haddock et al., 2013; Langeveld et al., 2014; McGregor, Castle, & Dolan, 2012). These results also support earlier findings by Fazel, Buxrud, Ruchkin, and Grann (2010) and

El-Hadidy (2012), which found a history of violence to be an accurate predictor of future violence, mainly homicide, in patients with schizophrenia.

Researchers Short et al. (2013) performed a study, which gave further consideration to the possibility of a relationship between comorbid substance usage and violent individuals with schizophrenia. Short et al. (2013) were looking to determine whether the existence of a substance abuse disorder precluded violence or criminal activity with the examination of the prevalence of crime and violence among individuals with schizophrenia. Short et al. (2013) found individuals diagnosed with schizophrenia were at an increased risk of violent and criminal offending, supporting previous findings by Edlinger et al. (2014). However, Short et al. (2013) determined this risk of violence could not be solely accredited to the occurrence of comorbid substance disorders, but instead just increases the likelihood of criminal offending.

Fazel and Wolf et al. (2014) also researched the presence of specific risk factors among individuals with schizophrenia, and how these factors influence the act of violent crime and suicide. Fazel and Wolf et al. (2014) described suicide and self-harm as acts of violence against oneself within their research, factors common among individuals diagnosed with schizophrenia (Ghoreishi et al., 2015). Fazel and Wolf et al. (2014) found individuals diagnosed with schizophrenia presented with three risk factors that were similar to those of individuals without a diagnosis of schizophrenia, including drug use disorders, prior criminal convictions, and suicidality. The finding of suicidality being a risk factor supports previous findings by Neuner et al. (2011) and Tousignant et al. (2011).

Taking into consideration self-harm and other harm, Jakhar et al. (2015) performed research to determine the prevalence of violence among individuals with schizophrenia. Jakhar et al. (2015) further emphasized the rate of individuals with schizophrenia being four to six times more likely to commit violent crimes, a rate identified by previous research. Within their research, Jakhar et al. (2015) examined various risk factors among patients with schizophrenia. They found a historical risk of violence among 65.55%, risk of self-neglect reported by 53.33%, risk to others among 47.41%, and risk of self-harm reported by 22.59% among the sample (Jakhar et al., 2015). These findings, specifically the percentage of risk of self-harm, is something supported by the aforementioned research article by Fazel and Wolf et al. (2014).

Ghoreishi et al. (2015) described individuals with schizophrenia as being 4 to 6 times more likely to commit violent crimes when compared to the general population. The researchers examined the various factors, ranging from marital status to the diagnosed type of schizophrenia. Ghoreishi et al. (2015) found within their sample of individuals with schizophrenia that those which had a criminal status were more likely to be younger, educated males who were employed before their diagnosis of schizophrenia, and single or divorced. Regarding the type of schizophrenia the offenders were diagnosed with, Ghoreishi et al. (2015) reported 66.1% of the sample was diagnosed with paranoid type schizophrenia.

Another group of researchers looked into the recidivism of people with schizophrenia who had already committed a homicide, and how this risk could be identified in patients. Golenkov, Large, and Nielssen (2013) considered the differences present among

offenders with schizophrenia in the Chuvash Republic of the Russian Federation. These researchers found 10.7% of the population examined had committed a second homicide within the 30-year time frame of the study (Golenkov et al., 2013). These findings are similar to the previously reported percentage of 10% found by Yates, Kunz, Khan, Volavka, and Rabinowitz (2010). Golenkov et al. (2013) were hoping to determine a way of predicting whether an individual with schizophrenia would be at risk of committing another homicide upon release. However, they were able to conclude the need for further research with a larger population in order to find a more accurate demonstration of homicide recidivism in offenders diagnosed with schizophrenia (Golenkov et al., 2013).

Looking further into the level of violence found among individuals with schizophrenia is the study performed by Candini et al. (2015). The researchers wanted to examine the various aspects of violent and never-violent people with schizophrenia and determine if they could find a connection would shed light on the difference in these individuals. Candini et al. (2015) examined participants over a course of two years in order to determine whether prior violence is a predictor of future violence in a schizophrenic population. The researchers found people with schizophrenia, whom had exhibited violent behavior in the past, displayed significantly more aggressive behavior when compared to the never violent control group (Candini et al., 2015), similar findings to those previously reported by others (El-Hadidy, 2012; Edlinger et al., 2014; Lund, Hofvander, Forsman, Anckarsater, & Nilsson, 2013).

Additional research was performed in Japan by Imai et al. (2014), which examined the various factors associated with violence among schizophrenic individuals. Imai et al.

(2014) examined a cohort of Japanese patients with schizophrenia, and compared different risk factors present in these patients with the findings from Caucasian populations. There were similar findings when they considered prior violence among the patients, but unlike the studies done with Caucasian populations, Imai et al. (2014) were unable to find a significant relationship between history of substance abuse and violence. Although the findings are compelling, Imai et al. (2014) warns that the results may not be generalizable to other populations due to Japan's very low crime rate when compared to the rest of the world.

Ural et al. (2013) performed a research study among Turkish individuals within an inpatient clinic. The goal of this study was to determine if there were observable patterns between the criminal offenses of individuals with schizophrenia (Ural et al., 2013). The researchers found that 80.7% of the patients who were under treatment for schizophrenia within the inpatient setting were diagnosed with paranoid type (Ural et al., 2013). This finding supports the suggestion that the act of violence is often related to the psychotic symptoms of schizophrenia, and was not committed with a purpose or an intention (Ural et al., 2013). These findings, although from a Turkish population, are able to give further credence to research findings from other areas of the world (Haddock et al., 2013; Imai et al., 2014; Jakhar et al., 2015; Kooyman et al., 2012; Lamsma & Harte, 2015; Langeveld et al., 2014; Walsh & Yun, 2013; & Witt, Van Dorn, & Fazel, 2013)

Researchers Bragado-Jimenez and Taylor (2012) wanted to examine if the level of empathy in individuals with schizophrenia was influential to their displayed violent behaviors. There has been a link in impairment when considering empathy and violence, as well as a link between schizophrenia and empathy impairments (Bragado-Jimenez & Taylor,

2012). Bragado-Jimenez and Taylor (2012) hypothesized that with the presence of these links, the empathy impairment in individuals with schizophrenia would further influence violent behavior. However, the results of their study were inconclusive, needing further research and analysis (Bragado-Jimenez & Taylor, 2012).

Furukawa (2015) made a suggestion of depression among individuals increased their demonstration of violent criminal behavior. Furukawa described depression and violence as being associated with genetic factors after having examined those individuals with schizophrenia. Furukawa believed the diagnosis of schizophrenia in family members could play a part in the violent crimes being committed by certain individuals. Furukawa found an incidence rate of violent crime in individuals diagnosed with depression, as well as being diagnosed with schizophrenia, was between 2% and 10% five years after they had first been diagnosed. These results suggest the idea of a comorbid diagnosis of depression accounting for violent behavior among individuals diagnosed with schizophrenia (Furukawa, 2015).

Although not directly identified as criminal behavior or violence, Reddy et al. (2014) examined how impulsivity can present in individuals diagnosed with schizophrenia. Impulsivity, for example, can equate to risky decision-making, which in turn can lead to criminal behavior or aggression (Reddy et al., 2014). Reddy et al. (2014) found schizophrenia patients were higher in self-reported impulsivity, but varied levels of impulsivity and risk taking behavior when performing tasks. These mixed findings within individuals with schizophrenia could be attributed to various factors, such as the type of medication they were currently taking when the risk taking and impulsivity were assessed (Hodgins, 2014; & Reddy et al., 2014). Reddy et al. (2014) additionally suggested that the

medications being prescribed to treat schizophrenia might alter the symptoms individuals are presenting with, which can further affect their risk taking behavior.

Lamsma and Harte (2015) also examined the relationship between psychosis and violence among individuals within previously published research articles. Lamsma and Harte (2015) took a closer look at 69 studies, being able to determine there are several risk factors that offer an outcome of violence. These risk factors include demographics, social factors, delusions, hallucinations, and comorbid diagnosis of antisocial personality disorders or substance usage (Lamsma & Harte, 2015). Lamsma and Harte (2015) suggest the importance of understanding the various factors having influence over the display of violence relates to being able to properly prevent and treat individuals diagnosed with psychosis at risk of developing violent behaviors.

The research studies within this subsection offer support for the idea of individuals diagnosed with schizophrenia having an increased risk of aggressive tendencies (Reagu et al., 2013), with aggression increasing when they are anxious or diagnosed with paranoid type schizophrenia (Ghoreishi et al., 2015; Nederlof et al., 2014). A history of violence was also determined to be a contributing factor to the display of aggression, violence, or criminal behavior (Dack et al., 2013; Short et al., 2013), as well as a comorbid diagnosis of either substance usage or a personality disorder (Edlinger et al., 2014; McCabe et al., 2012). Fazel et al. (2014) indicated an increased risk of suicidality and self-harm among individuals with schizophrenia, a finding supported by the results of a study performed by Jakhar et al. (2015). Ultimately, with these results, multiple researchers suggest these findings being beneficial to the development of models of violence (Steinert & Whittington, 2013), an

accurate demonstration of homicidal recidivism among schizophrenics (Golenkov et al., 2013), as well as other influential factors (Lamsa & Harte, 2015).

Personality, Criminal Behavior, Aggression, and Violence

Regarding the relationship between personality and crime, various researchers are guided by Eysenck's theory. Boduszek et al. (2013) performed a study examining criminal thinking styles among violent and nonviolent offenders. The results of their research demonstrated there are five significant predictors of criminal thinking: psychoticism, extraversion, neuroticism, criminal friends, and criminal identity (Boduszek et al., 2013). These findings are supportive of Eysenck's original idea of criminals scoring higher on all three of the described personality dimensions, further supporting the theory of crime and personality (Boduszek et al., 2013).

Other researchers have utilized Costa and McCrae's FFM to examine the personality dimensions of criminal offenders. Claes et al. (2014) examined the relationship between the five factors of personality and how these dimensions related to the displayed criminal behavior in participants. Although the main focus of the research was on psychopathy, Claes et al. (2014) considered all five factors within the FFM. Claes et al. (2014) found that the more aggressive group studied scored high in neuroticism and low in extraversion, agreeableness, openness, and conscientiousness. These findings offer further support to previous research findings (Jones, Miller, & Lynam, 2011; Pechorro, Maroco, Goncalves, Nunes, & Jesus, 2013; Sanz, Garcia-Vera, & Magan, 2010).

Poy, Segarra, Esteller, Lopez, and Molo (2014) performed a study in order to consider the psychopathy and displayed FFM traits of both men and women. Poy et al.

(2014) found within their study determined there is no significant difference among traits displayed among men and women. However, Poy et al. (2014) discovered the relations between meanness and agreeableness was stronger for men than for women. Poy et al. (2014) explained the presence of meanness as a combination of low agreeableness and somewhat low conscientiousness, two of the traits found within the FFM. Poy et al. (2014) further discussed the findings of disinhibition pertaining to both low agreeableness and conscientiousness, but also a high level of neuroticism and extraversion.

Zajenkowska, Jankowski, Lawrence, and Zajenkowski (2013) also performed a study designed to consider the differences among individuals and their display of aggressive behaviors. Like Claes et al. (2014), Zajenkowska et al. (2013) found higher scores of neuroticism and lower scores of agreeableness in individuals displaying anger and hostility. However, they further observed that neuroticism tends to be associated with anger, while agreeableness was associated with behaviors of aggression (Zajenkowska et al., 2013). Zajenkowska et al. (2013) also discovered individuals scoring high on neuroticism tended to be more sensitive to outside stimuli, further stressing their psychological abilities. Zajenkowska et al. (2013) only found significant correlations between aggression and three of the FFM traits (neuroticism, openness, and agreeableness), unlike the findings by Claes et al. (2014).

Personality measures are often utilized in order to determine an individual's potential of harmful behavior. Gardner, Boccaccini, Bitting, and Edens (2015) performed a meta-analytic review of previously published research studies to examine how the use of the Personality Assessment Inventory (PAI) would be able to predict violence or criminal

behavior. The researchers found that the PAI was better at predicting misconduct or harmful behavior of an offender while they were institutionalized, while not being a strong predictor of recidivism (Gardner et al., 2015). These results of the PAI utility are similar to the findings of the use of PCL-R in predicting institutional misconduct, being only slightly lower in the levels of prediction (Gardner et al., 2015).

Pickard (2015) performed research considering the presence of personality disorders among individuals, and how these disorders may be responsible for criminal behavior, aggression, or self-harm. Pickard (2015) suggests that the presence of a personality disorder would be concerning in the respect of a person being at risk of becoming violent to themselves or others. Pickard (2015) further found that consideration could be given to whether the individual was responsible for the crime they committed, or if the presence of a diagnosed personality disorder was hindering their abilities. Although this research was performed within England and Wales, the findings suggest there is need for appropriate treatment options and support systems to address personality disorders and their influence on criminal behavior (Pickard, 2015).

Bobadilla et al. (2012) gave further consideration of personality being influential to the displayed aggression of individuals. Bobadilla et al. (2012) examined how two previously identified subtypes of aggression differed when it came to personality profiles. They found the reactive aggression subtype, defined by its impulsive aspect, was more closely associated with the personality aspect narcissism, while the proactive aggression subtype was closely related to psychopathy (Bobadilla et al., 2012). Considering these

results, Bobadilla et al. (2012) determined well defined models of these subtypes are needed to better understand the correlation between proactive and reactive aggression.

Taking other factors, such as sex and race, into how psychopathology may predict criminal behavior were the researchers Baskin-Sommers et al. (2013). Baskin-Sommers et al. (2013) looked at data from an imprisoned population and utilized this population within their research article. The researchers hoped to find a relationship between how sex and racial experiences contributed to the violent behaviors in individuals with a diagnosed personality disorder (Baskin-Sommers et al., 2013). Baskin-Sommers et al. (2013) found Black males and females, which had been diagnosed with antisocial personality disorder and psychopathy had results consistent with a higher likelihood of committing violent crimes. These findings further suggest additional consideration be given to the sex and race subgroups, at least when looking at the relationship between psychopathology and violent crime (Baskin-Sommers et al., 2013).

Another researcher having considered the importance of social factors, personality traits using the FFM, and offending is Jolliffe (2013). Jolliffe's (2013) research provided further deliberation to how different personality profiles are found among females and males within an offending population. The utilization of a participant sample of 720 adolescents allowed the results of Jolliffe's (2013) study to find low agreeableness and low conscientiousness as being independently related to self-reported offending in males, while only low agreeableness predicted the frequency of offending in males. However, only low conscientiousness was independently related to female offending (Jolliffe, 2013). These

results highlight the previously suggested idea of females and males differing when it comes to measures of personality and offending (Jolliffe, 2013).

Aggressive behavior and personality traits were used to examine the relationship between criminal behavior among individuals and their psychological traits. This research was performed by Kamaluddin et al. (2015), and utilized an archival research methodology to go through previously published research articles meeting the criteria. Kamaluddin et al. (2015) emphasized that psychological traits should not be considered to be the cause of criminal behavior, but instead suggested there be another linkage between the traits and crime. The results of their research supported the concept of a link being among the four psychological traits of personality traits, low self-control, aggression behavior, and cognitive distortion (Kamaluddin et al., 2015). Kamaluddin et al. (2015) indicated a need to identify these linkages for prevention, intervention, and rehabilitation of criminal behavior among individuals utilizing the known link between the traits and crime.

These research studies, which pertained to the personality factors among individuals, had similar findings to each other. Boduszek et al. (2013) found five predictors of criminal thinking, including neuroticism and extraversion, factors of the FFM. Researchers found a lower presented variation in agreeableness, conscientiousness, openness, and extraversion (Claes et al., 2014; Poy et al., 2014; Zajenkowska et al., 2013), with higher levels of neuroticism (Claes et al., 2014). Even though presented in the previous subsection, the presence of personality disorders was discussed and found to be influential in the violence of individuals (Pickard, 2015).

Schizophrenia, Personality, and Criminal Behavior

The following research articles show there have been some studies performed regarding the relationship between schizophrenia, personality, and criminal behavior. However, the majority of these research articles include the presence of comorbid diagnoses, such as personality disorder and/or substance abuse among individuals with schizophrenia. The researchers within these research articles have provided findings suggesting the need for further research and consideration of the various aspects.

Maghsoodloo et al. (2012) performed a research study, for example, which analyzed the relationship between the comorbidity of antisocial personality disorder, conduct disorder, and crime among individuals with schizophrenia. Their findings demonstrated a higher prevalence of antisocial personality disorder and a history of conduct disorder among those criminals with schizophrenia examined (Maghsoodloo et al., 2012). Furthermore, there was an observable occurrence of drug abuse among 66.7% of the studied criminals with schizophrenia, proposing drug abuse could potentially increase the risk of violent behavior among these individuals (Maghsoodloo et al., 2012). The researchers suggested with the result of these findings, there is the need for further consideration in treatment, such as not just treating the symptoms of psychosis but the underlying comorbidities as well (Maghsoodloo et al., 2012; Riser & Kosson, 2013).

Riser and Kosson (2013) had performed a research study to consider the presence of antisocial personality disorder among male criminal offenders, and wanted to further determine the relationship between the presence, and lack thereof, of psychopathy. Riser and Kosson (2013) initially outlined the importance of needing to differentiate between psychopathy and antisocial personality disorder. This differentiation is important when

considering whether the comorbidity of psychopathy with individuals diagnosed with antisocial personality disorder is a greater cause for concern of criminal behavior (Riser & Kosson, 2013). The researchers found were individuals diagnosed with antisocial personality disorder, with or without comorbidity of psychopathy, displayed more criminal behavior than the controls. However, they also found these individuals had demonstrated less severe criminal behavior than those offenders with a comorbid diagnosis of psychopathy with their antisocial personality disorder (Riser & Kosson, 2013).

Researchers Vohs, Lysaker, and Nabors (2013) considered the type of motivation individual's experience, which might lead them to display criminal behavior. Their research pertained to patients with schizophrenia, examining their displayed personality traits, and the identification of a possible relationship with intrinsic motivation (Vohs et al., 2013). Extraversion and neuroticism from the FFM were linked to intrinsic motivation within the schizophrenic population, with extraversion being the only factor being able to predict intrinsic motivation (Vohs et al., 2013).

Schizophrenia, Personality, and Aggression

Bo et al. (2013a) determined personality pathology accounts for aggression in schizophrenia, meaning there is a greater likelihood an individual with schizophrenia will demonstrate aggressive tendencies. This notion is directly related to whether they have been diagnosed with a personality disorder. The results of the study by Bo et al. (2013a) suggest the displayed level of aggression is positively related to whether an individual with schizophrenia has an underlying personality disorder.

Additional research was performed by Bo et al. (2013c), which addressed the presence of subtypes of aggression within individuals diagnosed with schizophrenia and how psychopathology played a role. Bo et al. (2013c) were able to examine the presence of psychopathy in each subtype of aggression, premeditated aggression and impulsive aggression by utilizing the Psychopathy Checklist-Revised (PCL-R). They found that by looking at samples of forensic psychiatric and offender populations was a strong relation of psychopathy to the presence of aggression, as well as the notion that individuals diagnosed within Axis-I disorder, such as schizophrenia, had a higher association with impulsive aggression (Bo et al., 2013c). Offenders with schizophrenia were found to have higher scores on the PCL-R regarding premeditated aggression, a result supporting earlier research suggesting the same of general offender populations (Bo et al., 2013c).

Darrell-Berry et al. (2016) also performed research regarding the relationship between paranoia and aggression within those individuals diagnosed with a psychotic disorder. These researchers further explain the use of aggression by individuals experiencing psychosis includes the frequent belief of other individuals intending to harm them. Darrell-Berry et al. (2016) also suggest the need for understanding of displayed personality traits among individuals with psychosis in order to determine the impact of violence and aggression on treatment options. Within their research of aggressive and non-aggressive individuals, Darrell-Berry et al. (2016) found results from previous research demonstrating a relationship between paranoia and physical aggression among patients with a psychotic disorder.

Schizophrenia, Personality, and Violence

A research study performed by Volavka (2014) gives further credence to the notion that the personality of a psychotic patient can add to individual's displayed violent behavior. Volavka (2014) found more people with schizophrenia were among those individuals diagnosed with antisocial personality disorder in comparison to those without the personality disorder diagnosis. Additionally, they found men with schizophrenia were more likely to have displayed conduct disorder when they were in their preteen years (Volavka, 2014). Both antisocial personality disorder and conduct disorder are known for the inclusion of violent behaviors (Volavka, 2014).

Bruce and Laporte (2015) performed research focusing on trauma, antisocial personality typologies, and violent activity among individuals with severe mental illness. Although Bruce and Laporte (2015) did not look specifically at schizophrenia within their severe mental illness aspect, their findings have generalizability to mental illnesses. These researchers found that when considering age of onset of antisocial conduct, individuals having reported childhood trauma and early conduct problems are at a greater risk of behaving in violent manners (Bruce & Laporte, 2015). Bruce and Laporte (2015), with the results of this study, suggested the assessment of antisocial typologies among individuals with severe mental illness being beneficial when considering treatment options and risk of future violent behaviors.

Radovic and Hoglund (2014) considered the presence of mental disorders among individuals found within the court, and how the disorders played a role in the criminal events that had taken place. The researchers looked at whether the presence of a mental disorder, such as schizophrenia, would influence or be a contributing cause of criminal

behavior (Radovic & Hoglund, 2014). Radovic and Hoglund (2014) found evidence supporting previous ideas of violence occurring more frequently among individuals with mental disorders, but also determined this frequency or higher risk of violence was due to drug abuse and socio-economic deprivation. Radovic and Hoglund (2014) further determined the diagnosis of a mental disorder was not a major contributing factor when it came to crime.

Dolan et al. (2013) looked at violence and schizophrenia from a different perspective. These researchers considered individuals with schizophrenia as the victims of violence instead of being the perpetrators of violence. Dolan et al. (2013) initially discovered those patients with a mental illness having a history of violence or the presence of antisocial behaviors were more likely to be the victims of violence when compared to those without a history of violence or antisocial behaviors. Dolan et al. (2013) additionally found the presence of substance abuse among those individuals with schizophrenia as being significantly higher within the victimized group when compared to the non-victimized group.

Summary and Conclusions

Recognizable themes within the literature present themselves throughout different articles; one such theme is of comorbidities. These comorbidities include personality disorders, substance abuse, and conduct disorder. Each of the identified comorbidities has its own set of influential aspects when looking at individuals with schizophrenia and their criminal behavior. However, these aspects were not the main focus of this study.

Another theme within the summarized literature is the presence of violence among individuals with schizophrenia. Although it has long been believed individuals with schizophrenia were more violent than the normal population, research has been performed recently, which provides supportive findings (Bo et al., 2013b). Violence can often be related to criminal behavior, as individuals have the potential of being charged with violent crimes, such as homicide and assault. Violence and criminal behavior were considered when examining the relationship with schizophrenia and personality within the literature review due to this relation.

Limited research on the area of personality traits among individuals with schizophrenia with and without a violent history has been performed, as previously mentioned. There are multiple articles addressing two of the three variables described, but these are not sufficient in determining the relationship between personality traits and displayed criminal behavior in individuals with schizophrenia. Professionals may be able to determine proper risk assessments and treatment options for individuals with schizophrenia by having a better understanding of the personality traits present (Maghsoodloo et al., 2012; Riser & Kosson, 2013).

The research design suggested for the approach of this research allows for further consideration of the relationship between personality traits and violent criminal behaviors displayed in individuals with schizophrenia. The effect of each of the five personality traits within the FFM was analyzed using the selected secondary data. The secondary data was inclusive of personality assessment measures. Additionally, violent behavior histories were

examined and included in the data analysis due to the desire to consider the possible relationships between the three identified variables.

Chapter 3: Research Method

Introduction

This quantitative study was designed to explore whether there is a relationship present between the five factors of personality within the FFM, and the displayed behavior among individuals diagnosed with schizophrenia. If there was determined to be a predictability nature of personality traits in consideration of violent or nonviolent behaviors, the findings of this research may be beneficial in designing treatment option. The use of separate univariate analyses of variance (ANOVA) were used to analyze the variations of each five factors among the sample of individuals with schizophrenia. The use of multiple ANOVAs allowed for consideration of each five factors, and suggestibility of looking further at the facet level of these personality factors. The final data analysis performed was a binary logistic regression to examine the predictability of the dependent variable when introducing the independent variable.

The significance of the independent variables, the five factors of personality from the FFM, along with the dependent variables, the violent or nonviolent behavior and history of individuals with schizophrenia are described within the chapter. Separate univariate analyses of variance were chosen for the study's statistical test. The number and type of variables identified for each research question dictated the statistical analysis chosen. There were minimal design constraints within this study, as the use of data already collected allowed for little concern of time or the accessibility of the desired population. Psychological inventories, operationalization of the variables, and statistical data analyses used are further explained. The participants' data, if not provided for already in code or

anonymous, was kept secure and confidential. The conclusion of the chapter includes the discussions of the anticipated test results and statistical relationships within chapter 4.

Research Design and Rationale

Variables

The independent variables, personality traits, were examined and analyzed by use of personality inventories. The personality traits examined were those inclusive within the FFM: neuroticism, extraversion, openness, conscientiousness, and agreeableness. Researchers possess a greater confidence in their findings by using an already developed and tested personality inventory. The personality inventory utilized in the original research study was the NEO-FFI, the shortened version of the NEO-PI-R specifically designed to examine the FFM (Costa & McCrae, 1992b).

The dependent variables, violent and nonviolent behaviors identified, were initially examined and acknowledged by Ohi, Shimada, and Kawasaki (2015) by performing unstructured clinical interviews, in addition to reviewing patient medical records. An individual with a violent or nonviolent behavior defined the dependent variable within the given data set. The definition of violence used to assess the behaviors within this data set was the one provided and described by Darrell-Berry et al. (2016), in which extreme harm is the intended outcome or goal of displayed aggression.

Connection to Research Questions

This quantitative study looked at the relationship between an individuals displayed behavior and specific personality traits, as defined by the FFM. This study's research questions explored the relationship present between violent and nonviolent behavior and

personality among individuals diagnosed with schizophrenia, an area of research not fully addressed in previous research studies. Ohi, Shimada, and Kawasaki (2015) had originally gathered data in order to perform a research study determining the intermediate phenotypes for psychiatric disorders. Their research included various aspects and background information of its participants. This information included NEO-FFI scores, diagnosis of schizophrenia by at least two trained psychiatrists using the criteria of the DSM-5, as well as age, gender, years of education, and their estimated premorbid intelligent quotient (IQ)(Ohi, Shimada, & Kawasaki, 2015). However, the researchers had not analyzed the data to determine the relationship of demonstrated personality traits among schizophrenics, and how it correlates to their violent or nonviolent behavior.

The personality traits within the FFM are further described as having 6 facets to further break down the traits. Each of the research questions pertaining to these personality traits addressed the corresponding 6 facets. These facets were further identified and examined with the use of the NEO-PI-R (Costa & McCrae, 1992b). However, although the following information addresses the facets related to the identified research questions, only the single trait scores from the NEO-PI-R and found in the NEO-FFI were utilized within the proposed research. The identification of these facets have the potential to provide further insight into what is influential to the single trait score of each factor.

Research question 1 looked to identify the difference in neuroticism scores of violent and nonviolent individuals diagnosed with schizophrenia. The neuroticism trait within the FFM has the 6 facets of anxiety, angry hostility, depression, self-consciousness, impulsiveness, and vulnerability (Costa & McCrae, 1992a). An individual scoring higher

within the neuroticism trait demonstrates an inability to control their anger and impulsive behavior, actions, which may result in the displaying of violent behavior. However, further examination of the factors making up the neuroticism trait may lead to discovery of other types of relationships as well.

Research question 2 considered the difference in extraversion scores among individuals diagnosed with schizophrenia and the presence of violence in their behaviors. The FFM identifies the 6 facets of extraversion as warmth, gregariousness, assertiveness, activity, excitement seeking, and positive emotions (Costa & McCrae, 1992a). The varying levels of these facets can influence the displayed behavior of the individuals being examined (Claes et al., 2014). The presence of lower levels of warmth and positive emotions, as well as higher levels of the excitement seeking and assertiveness facets suggest an individual with these displayed levels may be at higher risk of displaying violent behaviors.

Research question 3 considered the personality trait of conscientiousness. Conscientiousness is made up of the facets including competence, order, dutifulness, achievement striving, self-discipline, and deliberation (Costa & McCrae, 1992a). The facets of competence, order, and self-discipline may pose an important influence on the display of violence among schizophrenics. However, there may be other facets within conscientiousness, which lead to violence opposed to others. These are the differences and relationships that were examined within this research.

Research question 4 pertained to the displayed personality trait of openness to experience and change. Openness is made up of facets including fantasy, aesthetics, feelings, actions, ideas, and values (Costa & McCrae, 1992a). Higher scores within the

facets of actions and fantasy may prove to be influential to the displayed violence of schizophrenic individuals. Lower scores within the values and feelings facets may also have a connection to the presence of violent behaviors.

Research question 5 addressed the presence of the personality trait of agreeableness within individuals diagnosed with schizophrenia, and how it pertains to their displayed violent or nonviolent behaviors. The trait of agreeableness consists of the facets of trust, straight forwardness, altruism, compliance, modesty, and tender mindedness (Costa & McCrae, 1992a). Various levels of these facets have the potential to influence the displaying of violent behavior. For example, lower scores on tender mindedness, modesty, compliance, and trust could further be the difference among schizophrenics and whether they are more prone to violent behavior or not.

Research question 6 pertained to the examination of the combined and relative effect of all five of the described personality traits. The ability to predict violent versus nonviolent behavior is one, which may be beneficial if accurately identified. The research question had a different approach than the previous questions, as there are no testable hypotheses. Instead of hypotheses, the results of the binary logistic regression were used to examine the relationships further between the five personality traits identified.

Design Constraints

The main design constraints of this quantitative research study included the ability to obtain and utilize certain historical or secondary data, which can be applied and generalized to the population today. The use of secondary or historical data allowed for mentally ill and other high-risk individuals to be included in the study population, without needing to get

additional approval due to it being a protected population. Due to the data having already been collected by other researchers, obtaining their permission to utilize the data may have proven difficult. However, by using secondary data, there was little to no security risk towards those participants involved.

A constraint, which may have arisen from this design, was the accessibility to the data from the original researchers. A formal request was sent to the author of the research, Dr. Ohi; however, if a timely response had not been made, time might have become an important constraint. The data collected by Ohi, Shimada, and Kawasaki (2015) was done within a recent timeframe, but having the appropriate viewing software or program could have delayed this research progress. Knowing how the data had been stored and how to properly access the information helped eliminate any time constraints that may have presented themselves at a later date.

Consistency in Design Choice and Needed Research Design

Prior research has occurred among the three described variables, with limited research including the examination of all three in one study. Personality has been recognized as a key predictor of violent behavior among various individuals (Boduszek et al., 2013), as well as a connection between personality traits and criminal thinking (Kamaluddin et al., 2015). Personality is a factor recognized among researchers, but one concern is the inability to determine an agreed upon definition within the psychology community. Ohi, Shimada, and Kawasaki (2015) used the NEO-FFI within their research; an appropriate and defendable decision when considering this personality inventory was specifically designed to look at the FFM. The intent of using a personality inventory

designed specifically for the FFM allowed for the acceptance of the inventory properly and accurately demonstrating a representation of each factor.

Methodology

Population

The target population of interest consisted of individuals diagnosed with schizophrenia and their personality traits examined (Ohi, Shimada, & Kawasaki, 2015). The size of the target population was based upon the availability of participants within the secondary data. The original sample included 70 individuals over the age of 18 years old, and also had the inclusion of both males and females (Ohi, Shimada, & Kawasaki, 2015). All of the participants were of Japanese descent and were not biologically related to at least the second degree.

Sampling and Sampling Procedures

Sampling for this research included populations taken from previously performed research, representing a convenience sampling. These samples were inclusive of different types of participants, however, only those individuals diagnosed with schizophrenia were initially considered. Since the sample was one of convenience, it was important the data used was only from those diagnosed with schizophrenia. Ohi, Shimada, and Kawasaki (2015) examined the presence of other mental disorders as well, requiring the exclusion of those participants with a diagnosis other than schizophrenia.

The referencing of a statistical power table was used in order to determine the minimum number of participants that would be needed to analyze to produce a power of .80 with $\alpha = .05$ (Stangor, 2015). The number of participants needed to yield a medium effect

size of .25 was a total of 128 individuals. However, within the data set utilized in this research, there were only a total of 70 individuals. Fortunately, Cohen (1982) suggests increasing the α as acceptable "when it is not possible to increase one's sample size (because of the paucity of the population)" (p. 252). The increase of α to .10 was supported by this logic, and as it turns out the effect size of Cohen's $f = .20$ is still significant if there are an equal number of cases in each of the violent and nonviolent groups. Additionally, even if there are more cases in one group compared to the other, Cohen's $f = .21$ is still statistically significant.

Procedures for Recruitment, Participation, and Data Collection

The use of archival data did not require the recruitment, participation guidelines, and data collection normally needed within research. However, the original researcher who gathered the data initially had recruitment procedures in line in order to collect accurate data. Ohi, Shimada, and Kawasaki (2015) gathered data on participants to perform a research study involving phenotypes in psychiatric disorders. These participants were recruited from both the outpatient and inpatient populations at the Kanazawa Medical University Hospital. The initial sample size was not known, however, the sample of participants with a diagnosis of schizophrenia was 70 (Ohi, Shimada, & Kawasaki, 2015). All 70 of these individuals had taken the personality inventory and provided informed consent (Ohi, Shimada, & Kawasaki, 2015). The researchers also gathered violent and nonviolent behavior information from unstructured clinical interviews and medical records (Ohi, Shimada, & Kawasaki, 2015). This data set was one having been made available through permission given by the Kanazawa Medical University Hospital and the researchers.

The procedure of finding the research data best fitting for this study required searching various databases, including Research Gate and the search engine Google Scholar. Then, research studies were examined to find which variables were included. Once the research article was determined to have the desired variables, to be able to use secondary data requires permission to be acquired from the researchers who initially gathered this information. A copy of the permission letter can be found in Appendix A.

Instrumentation and Operationalization of Constructs

Revised Neuroticism Extraversion Openness Personality Inventory. The NEO-PI-R, was published in 1990 and was developed by Paul Costa, Jr. and Robert McCrae. The NEO-PI-R is a revised version of the inventory NEO-PI, initially developed by Costa and McCrae in 1978. The NEO-PI-R is a psychological personality inventory consisting of 240 questions looking to measure the FFM personality traits. This is a self-report measure assessing the five domains of normal personality: neuroticism, extraversion, openness, agreeableness, and conscientiousness. Each of these domains is further made up of specific facet scales, which are examined by the NEO-PI-R. The facets of neuroticism include anxiety, angry hostility, depression, self-consciousness, impulsiveness, and vulnerability. The facets of extraversion include warmth, gregariousness, assertiveness, activity, excitement-seeking, and positive emotions. The facets of openness are fantasy, aesthetics, feelings, actions, ideas, and values. The facets of agreeableness are trust, straightforwardness, altruism, compliance, modesty, and tender-mindedness. The conscientiousness facets are competence, order, dutifulness, achievement striving, self-discipline, and deliberation.

The NEO-FFI, the shortened version of the NEO-PI-R is used in the assessment of each research question presented. Permission from the developers of this inventory was not required, as the original researchers would have acquired it initially. The published reliability and validity of the NEO-PI-R is comparable to the findings of the research by Ohi et al. (2016). The reliability reported in the inventory manual demonstrated values after the course of 6 years as follows: N = .83, E = .82, O = .83, A = .63, and C = .79. Costa and McCrae (1992c) reported the validity of the NEO-PI-R by comparing against other personality inventories previously published. The use of the NEO-PI-R was originally performed on a population consisting of both adult male and females of Caucasian ethnicity, but has gained acceptability across multiple cultures as having the ability to generalize across multiple ages and cultures.

Data Analysis

Research Question 1: What is the difference in neuroticism scores between individuals with schizophrenia having a history nonviolent and violent behavior?

Null Hypothesis ($H_0$1): There is no significant difference in neuroticism scores between individuals with schizophrenia who have demonstrated violent behavior compared to those with nonviolent behavior history.

Alternative Hypothesis (H_A1): There is a significant difference in neuroticism scores between individuals with schizophrenia who have a history of violent behavior compared to those with a nonviolent history.

Research Question 2: What is the difference in extraversion scores between individuals with schizophrenia who have a violent behavior history compared to those with a nonviolent history?

Null Hypothesis ($H_0$2): There is no significant difference in extraversion scores between individuals with schizophrenia who have demonstrated violent behavior and those who have a nonviolent history.

Alternative Hypothesis (H_A2): There is a significant difference in extraversion scores between individuals with schizophrenia who have demonstrated violent behavior and those who have a nonviolent history.

Research Question 3: What is the difference in conscientiousness scores between individuals with schizophrenia who have a history of violent behavior compared to those with a nonviolent history?

Null Hypothesis ($H_0$3): There is no significant difference in conscientiousness between violent and nonviolent individuals diagnosed with schizophrenia.

Alternative Hypothesis (H_A3): There is a significant difference in conscientiousness scores between individuals with schizophrenia who have a history of nonviolence compared to those who have a history of violent behavior.

Research Question 4: What is the difference in openness scores between individuals with schizophrenia having a violent behavior history compared to those with a nonviolent history?

Null Hypothesis ($H_0$4): There is no significant difference in levels of openness between violent and nonviolent individuals diagnosed with schizophrenia.

Alternative Hypothesis (H_A4): There is a significant difference in openness scores between individuals with schizophrenia who have a behavioral history of violence compared to individuals with a history of nonviolence.

Research Question 5**:** What is the difference in agreeableness scores between individuals with schizophrenia having a history of violence compared to those with no history of violence?

Null Hypothesis (H_05): There is no significant difference between nonviolent and violent individuals with schizophrenia when considering their level of agreeableness.

Alternative Hypothesis (H_A5): There is a significant difference in agreeableness scores between individuals with schizophrenia who have a history of violence when compared to those without a history of violence.

Research Question 6: What is the combined and relative effect of neuroticism, extraversion, conscientiousness, openness, and agreeableness in predicting violent versus nonviolent individuals? Rather than testable hypotheses, this research question was answered by a model-building approach (Jaccard & Jacoby, 2010).

IBM SPSS statistics software was utilized for the identified statistical analyses. Multiple ANOVAs were used to test Research Questions 1 through 5. This analysis was chosen due to the questions having only one dependent variable: violent or nonviolent behavior (Huberty & Morris, 1989). The variation and differences in displayed behavior, such as violent and nonviolent acts, were examined within the five personality traits identified. Levene's test of equality of variances was performed for each dependent

variable, violent and nonviolent behavior. The results of the Levene's test needed to be non-significant in order for the assumption of homogeneity of variance to be met (Field, 2013).

A binary logistic regression was used to test Research Question 6. This analysis was chosen due to the desire to test the predictability of two categorical outcomes (Field, 2013). Previous research supports the use of a binary logistic regression analysis when examining the predictors of certain outcomes (Lim et al., 2016; Tzeng, Lin, & Hsieh, 2004). The use of the Wald statistic allowed for the determination of whether a specific coefficient for a predictor is significantly different to zero (Field, 2013). A significant difference from zero suggested a significant contribution of the predictor in the outcome predicted.

Threats to Validity

The threats to validity are limited within a research study using secondary data. The original research, however, described various threats to the results found. The estimation of the results regarding violent history may not be accurate due to only viewing information gathered from unstructured clinical interviews and medical records. Further concern to validity was represented in the fact the assessment was performed with the shortened version of the NEO-PI-R, instead of performing both the self-report and observer-report versions of the NEO-PI-R. Self-report measures may have allowed for the possibility of the inaccurate reporting of information, such as participants under reporting undesirable aspects of their behavior or personality dimensions.

The initial participant pool of Ohi, Shimada, and Kawasaki (2015) research consisted of outpatient and inpatient populations at Kanazawa Medical University Hospital. This did not allow for the random assignment of individuals having demonstrated violent and

nonviolent behaviors, but limited the sample to those that had been hospitalized or sought medical attention (Ohi, Shimada, and Kawasaki, 2015). The sample, however, had already been divided into individuals diagnosed with schizophrenia (Ohi, Shimada, and Kawasaki, 2015). This division further allowed for the desired analysis within this research study.

There may have also been concerns regarding the findings and their applicability to the general population, or at least the population in which the sample refers to. Ohi, Shimada, and Kawasaki (2015) used data gathered from a hospital found in Uchinada, Ishikawa, Japan. The participants included individuals diagnosed with a psychiatric disorder, such as schizophrenia, and were originally recruited to examine the phenotypes in various psychiatric disorders (Ohi, Shimada, and Kawasaki, 2015). A concern in ability of participant replication might have become apparent if this research were to be replicated using different sites for acquiring of a specific population.

External Validity

Specifically, external validity within research considers various threats. These threats were inclusive of reactivity, interaction effects, and specificity of variables. Since this quantitative research design did not include the use of treatment or experimental variables, there were no reasons to worry about these factors being a threat to external validity. The concept of reactivity presented a potential threat to the external validity, considering the participants of the original study may have given more desirable answers on the personality assessment (Stangor, 2015). However, Ohi, Shimada, and Kawasaki (2015) did not disclose this as a major concern or threat to the external validity of their research. Therefore, it was not considered a worry to this research.

The specificity of the variables identified within this research study has been clearly outlined. The guidelines and definitions used to determine the variables and their facets have been taken from the published works of the FFM (Costa & McCrae, 1990). Their definitions were specific to the personality traits and their underlying facets as originally identified by Costa and McCrae (1992a). The external validity was strengthened by the use of these known and accepted definitions.

The greatest threat to external validity within research is the ability to generalize the results across participants, populations, and settings (Stangor, 2015). A way to minimize this threat was to only apply the findings towards the certain population being examined, individuals diagnosed with schizophrenia that had a history of violent behavior. Additionally, the concern of being able to exactly, conceptually, or constructively replicate the research was presented when considering external validity (Stangor, 2015). Minimizing of this threat pertained to clearly stating the research hypotheses, as well as the analysis in detail in order for future researchers to use the information provided to perform their own research.

Internal Validity

Internal validity, like external validity, is a concern when performing any research. Within this research, one threat that may have presented itself pertained to the dependent variable being caused by an unidentified variable instead of the independent variable (Stangor, 2015). Additional concern would have been presented if there would be an experimental factor included within the research design. However, there was no concern of

experimenter bias or a placebo effect, major threats to internal validity when examining research designs.

Statistical Conclusion Validity

The concept of statistical conclusion validity relates to the idea that the findings of the research are reasonable and correct. A threat to this validity can range from having a low statistical power to a sampling error. To combat the possibility of a threat to the statistical conclusion validity, the use of appropriate tests and reliable measurement procedures were utilized. The NEO-FFI, for example, is widely known and accepted within the psychology field. The use of this assessment tool reduced the supposed risks to conclusion validity.

Ethical Procedures

IRB approval was needed, and received, before the collection of data. The use of secondary data did not eliminate the need to receive IRB approval. However, the data must have been initially collected in an ethical manner, causing little to no harm physically or mentally to the participants. All of the participant information was kept confidential and names were coded to further keep confidentiality of the participants. The data provided by Ohi, Shimada, and Kawasaki (2015) had already been coded, making the confidentiality and anonymity of participants already available.

Additional concerns of how data was gathered were addressed by the IRB. The sample used within the research by Ohi, Shimada, and Kawasaki (2015) was sampled from the Kanazawa Medical University Hospital, where adult residents within areas of Uchinada, Ishikawa, Japan were selected for study. Ohi, Shimada, and Kawasaki originally gathered

the sample within the month of November in 2015. These participants were not coerced or forced to participate in any of the research. Informed consent was also provided to the sample before they were subjected to psychiatric examination (Ohi, Shimada, and Kawasaki, 2015).

All of the research data and analyses were stored on a designated flash drive, as well as backed up on an external hard drive used for a personal laptop. Both were kept in a secure location, under password protection, and were only accessible to those requiring access. Data averages and other findings may possibly be utilized in future research and publications. The data gathered from Ohi, Shimada, and Kawasaki (2015) will be destroyed once the information has been analyzed and does not offer any relevance for further use.

Summary

In Chapter 3, an explanation was provided to demonstrate how the six research questions would be answered. The focus of this quantitative study was to explore the relationship between the personality traits and the displayed violent behavior found among individuals diagnosed with schizophrenia. The variables identified were chosen in order to examine the presence of the FFM personality traits, as well as the displayed violent or nonviolent behavior.

Careful consideration was given to the selection of the secondary data utilized for this research. The requirements for the secondary data included having been assessed using a recognized and applicable assessment. The NEO-FFI was employed within the research from Ohi, Shimada, and Kawasaki (2015). Further consideration was also given to assure an accurate diagnosis of schizophrenia. The final decision was whether the behavioral history

of the participants was retrieved from a reliable source, such as a public record, or personal report. The data selected was acquired from the Kanazawa Medical University Hospital in Uchinada, Ishikawa, Japan, a well-known and respected hospital.

The statistical tests utilized within this research included multiple one-way ANOVAs, as well as a binary logistic regression using a model-building approach. The use of ANOVAs was chosen due to the desire to explore distribution of the five personality traits among the sample population. A binary logistic regression was also deemed appropriate in order to examine the predictability of the five factors together. Multiple concerns were further addressed in relation to limiting threats to internal and external validity within the proposed analyses. Threats related to specificity of variables, instrumentation, and statistical conclusion validity were also talked about, with steps described to ensure the results would stay within an acceptable range.

In Chapter 4, the findings of the statistical analyses and investigations will be provided and further discussed. Additional information regarding the collection of data will be explained, including the time frame. If there were any changes or discrepancies to the plan of collection from Chapter 3, this will also be addressed. Finally, the results of the one-way ANOVAs and binary logistic regression are presented in relation to the hypotheses originally described in previous chapters.

Chapter 4: Results

Introduction

This quantitative study was designed with the intent to determine if the presence of violent behavior in schizophrenics could be predicted by looking at the NEO-FFI scores of individuals. The effort to fill the gaps in the current research was the purpose of the study, beginning with individuals diagnosed with schizophrenia, then examining the distribution of NEO-FFI scores for each FFM personality trait. For each personality trait tested, there were varying scores among the participants. This variance was used to further examine the predictability of violence, relating back to the main purpose of the study.

Investigation into the personality traits and violence, by reason of the research questions, was conducted to determine whether there was a predictable nature when using the personality trait scores from the NEO-FFI. The investigations were carried out in efforts to identify the variance of scores within each aspect of the NEO-FFI, the traits neuroticism, extraversion, openness, agreeableness, and conscientiousness. The research questions one through five were written to examine each of these personality traits from the personality assessment. Within each of these five research questions, a specific personality trait is further looked into in regards to the presence of violence among the participants. The final research question considered the predictability of violence in relation to the five personality traits.

Previous researchers have found violence to be connected to certain levels of each personality trait within the FFM. Most notably is the correlation between the level of

neuroticism found within individuals and their display or history of violence. The levels of neuroticism among individuals with a demonstrated history of violence tend to have higher levels of neuroticism. As stated in the hypothesis for research question 1, the prediction of neuroticism scores among schizophrenic individuals with a violent history is in line with the previous findings. With so, the prediction was to have a higher level of neuroticism among schizophrenics having a history of violence, with those individuals without violent behavior having lower levels of neuroticism in comparison.

Unlike the findings of neuroticism, previous research had not found as concrete and definitive evidence pertaining to the levels of extraversion, openness, agreeableness, and conscientiousness. However, the hypotheses for research questions 2 through 5 predicted the results would examine further the difference in personality trait scores on the NEO-FFI. Additionally, the last hypothesis pertains to the predictability of violence by utilizing the scores of the NEO-FFI factors, relatively and combined, and applying them towards individuals diagnosed with schizophrenia. The expectation of this question was not explained with hypotheses, but instead used the approach of a model building technique to be able to demonstrate levels of predictability.

In this chapter, the purpose of this quantitative study is restated in the context pertaining to the research questions. The data collection process is further presented to include information regarding response rates of the participants, as well as the actual time frame utilized in collecting the data. Descriptive statistics for the sample chosen are also included within this chapter. Further discussion is provided on the distribution of the traits

scores before examination of the possible relationship and predictability of those traits to violence.

In the results section of this chapter, the descriptive statistics regarding each of the personality traits examined by the NEO-FFI are reported. All of the statistical assumptions corresponding to the analyses were evaluated and deemed appropriate to this study. By using the research questions and hypotheses, the statistical analyses findings are reported with each corresponding question. If there were any additional statistical testing, those tests are reported and further discussed in accordance with their consequent research question and hypotheses.

Data Collection

Dr. Ohi, Dr. Shimada, and Dr. Kawasaki collected the utilized secondary data over the course of a year, beginning in November 2015. The data was collected from various populations at Kanazawa Medical University Hospital, and was originally collected to examine the intermediate phenotypes found among individuals with psychiatric disorders. The purpose of the research study and procedures to be performed were all fully explained before participants provided written informed consent. Due to the data being secondary, the researchers did not provide the response rates. The sampling is one of convenience and is only inclusive of individuals of Japanese descent. No attempt was made to make the sample representative of other populations. Further utilization of the samples to draw inferences to populations is not recommended (Stangor, 2015). The total number of participants was 111, a higher number than originally anticipated. Within the sample, the breakdown of gender included 51 male and 60 female participants. All of the participants were diagnosed with

schizophrenia by at least two trained psychiatrists on the basis of unstructured clinical interviews, medical records, and clinical conferences. Each diagnosis was also made according to the criteria of the DSM-5.

All of the data was collected in accordance to the IRB guidelines and approval. The timeframe to collect the data was maintained, as Dr. Ohi was responsive in providing the data for usage. The sample provided had specific conditions excluded from analysis, including individuals having had neurological or medical conditions affecting their central nervous system. Although not required for this study, Dr. Ohi excluded these individuals from his original gathering of data. All participants have other additional information provided pertaining to years of education, age at onset, patient status, and duration of the illness (see Table 1). These participants also have a break down of the presence of violence and any suicidal attempts, which has been separated by gender (see Table 2).

Table 1

General Group Characteristics of Sample by Gender

Characteristic	Male (*n*=51)	Female (*n*=60)
Current Age (years)		
18-23	4	1
24-29	5	3
30-35	5	11
36-41	4	11
42-47	8	11
48-53	11	11
54-59	2	3
60-65	10	3
66-71	1	5
72-77	1	1
Age at Onset (years)		
9-14	1	1
15-20	21	18
21-26	8	17
27-32	13	9
33-38	2	3
39-44	4	5
45-50	1	4
51-56	1	1
57-62		2
Patient Status		
Inpatient	25	14
Outpatient	26	46
Education (years)		
9	7	3
10	3	1
11		
12	26	34
13	3	2
14	3	13
15	1	
16	8	7

Table 2

Primary Group Characteristics of Sample by Gender

Characteristic	Male (*n*=51)	Female (*n*=60)
Suicide Attempt		
Yes	5	7
No	46	53
Attempts		
1	1	4
2	2	
3	1	1
4		
5	1	1
6		
7		
8		
9		
10		1
Violent		
Yes	8	7
No	43	53
Times Violent		
1	1	
2		
3	3	3
4		1
5	2	
6		
7		
8		
9		
10	1	2
11		
12	1	
13		
14		
15		1

Results

Violence and violence history was defined as an act of severe interpersonal violence for the whole life of the participant. Violence against property was not considered and was excluded from the study. Additionally, only violent acts committed against others, which resulted in, or might have resulted in, physical harm to the victim, were considered for further investigation. The presence of violent behavior was given a score of 1 and then how many times the individual had displayed violent behavior was identified, as seen in Table 2. The values of the violence history were an all or nothing measurement.

A series of one-way ANOVAs were performed to determine whether the presence of violence had a relationship to the scores on the NEO-FFI for each personality factor of the FFM. Post hoc testing was not performed for violence due to there being fewer than three groups. Levene's Test of Equality of Error Variances was performed within the ANOVAs to determine if the variances of the values were significantly different (Field, 2013). The F-statistic was determined and examined for the variance within the samples. A one-way ANOVA was performed five times, using the same categorical IV but different DVs. The DVs were defined as scores from the neuroticism, extraversion, openness, agreeableness, and conscientiousness factors. The series of one-way ANOVAs was chosen due to the nature and design of the research study, how the data was presented, and the ability to do statistical testing in the IBM SPSS program for statistical analysis.

A binary logistic regression analysis was conducted to conclude whether there was a relationship between the IV and the DVs, which would be able to predict future results and relationships. The predictability of the DVs on the IV was determined by examining the *z*-

statistic, also known as the Wald statistic. This statistic allows for the assumption of the predictor making a significant contribution to the prediction of the outcome if the coefficient is significantly different than zero (Field, 2013). After interpreting the Wald statistic, the predictability of each personality factor furthers the understanding and applicability of the DVs in predicting the IV within the suggested population.

Descriptive Statistics

The original researcher and collector of the data did not provide recruitment statistics. There were a total of 111 participants in the data utilized, with no cases excluded. The one-way ANOVA test results were analyzed between groups on each DV. The test was performed for each personality factor of the FFM. For each of the one-way ANOVAs, effects were examined between the personality factors and the history of violence among participants (see Table 3). The history of violence group had higher mean scores on extraversion, agreeableness, and conscientiousness, and lower mean scores on neuroticism and openness.

Table 3

Means of Personality Factors and Presence of Violence

Personality Factors	Violent	*M*	*SD*	*N*
Neuroticism	No	30.00	6.24	96
	Yes	24.20	5.52	15
	Total	29.22	6.44	111
Extraversion	No	20.92	6.55	96
	Yes	23.27	6.76	15
	Total	21.23	6.60	111
Openness	No	25.33	5.50	96
	Yes	24.47	3.85	15
	Total	25.22	5.30	111
Agreeableness	No	25.43	6.06	96
	Yes	27.40	5.79	15
	Total	25.69	6.03	111
Conscientiousness	No	23.13	6.07	96
	Yes	25.60	5.83	15
	Total	23.46	6.07	111

Table 4

Significance of Personality Factors

Personality Factors	F	*df1*	*df2*	*Sig.*
Neuroticism	11.52	1	109	.001
Extraversion	1.66	1	109	.201
Openness	.35	1	109	.558
Agreeableness	1.39	1	109	.241
Conscientiousness	2.18	1	109	.143

Statistical Assumptions

One-way ANOVA. The one-way ANOVA is a statistical analysis utilized within numerical data when comparing the means and differences of three or more groups (Field, 2013). The main assumption of an ANOVA relates to the equality of the variances within the groups being examined. In other words, the sample population variances are equal and the difference between the estimated value and observed value is normally distributed. With the one-way ANOVAs, Levene's test was performed to determine the homogeneity of variances, while the Shapiro-Wilk test was utilized to assess the normality of the findings. The one-way ANOVA was the best choice for the first five research questions due to the nature of comparing the means of the sample groups.

The assumption of variances being equal among all combinations of groups within the independent variable was tested for each one-way ANOVA. Each test resulted with homogeneity of variances after utilizing Levene's test of equality for variances. These results can be seen within Table 4. Since the resulting values of the Levene tests were not significant, the examination of Welch's and the Brown-Forsythe *F*-ratios was not needed (Field, 2013).

The majority of the data was normally distributed, with only a few exceptions. The results of the Shapiro-Wilk's test, $p = .001$, for the non-violent samples within the agreeableness factor, and the $p = .018$ within the violent samples in the conscientiousness factor, were the only two results having non-normally distributed results. The results of the rest of the one-way ANOVAs were normally distributed, as previously suggested. These

results are neuroticism, violent, $p = .517$; neuroticism, nonviolent, $p = .384$; extraversion, violent, $p = .293$; extraversion, nonviolent, $p = .261$; openness, violent, $p = .554$; openness, nonviolent, $p = .523$; agreeableness, violent, $p = .462$; and conscientiousness, nonviolent, $p = .348$. Due to the possibility of there being Type I errors within the results, the Shapiro-Wilk's tests were chosen to be run to help eliminate the potential for these errors (Field, 2013).

Binary Logistic Regression Model. There are multiple assumptions within the binary logistic regression model, which were tested before applying the binary logistic regression model. First, linear relationships are assumed between the outcome and the predictors (Laerd Statistics, 2015). To test for the linearity of these relationships, the interaction of the natural log (Ln) of a variable and the original value of the variable were examined. If the interactions were found to be significant ($p < .05$), the main effect has violated the assumption of linearity (Field, 2013).

The test of linearity was performed for each of the personality factor results. The subsequent findings of linear relationships within these personality factors were as follows: neuroticism, $p = .724$; extraversion, $p = .293$; openness, $p = .235$; agreeableness, $p = .935$; and conscientiousness, $p = .422$. Since each of these results are non-significant in examination ($p > .05$), the relationship of the variables within the binary logistic regression model is deemed to be linear.

The goodness of fit regarding the model to the data was examined by performing the Hosmer and Lemeshow test. A model is deemed a good fit to the data if the resulting p-value is greater than .05 ($p > .05$). The significance level of this test was $p = .722$, not a

significant result, meaning the model tested was determined to be a good representation for the data used.

Statistical Analyses

One-way ANOVA. The one-way ANOVAs were run to determine whether there were differences between the means of the groups on personality factors (see Table 4). The difference among the presence, or lack there of, of violence were statistically significant only within the test for neuroticism, $F(1, 109) = 11.52$, $p < .001$, $\eta^2 = .096$. The group without a history of violence ($M = 30.0$, $SD = 6.24$, $n = 96$) scored higher on neuroticism than the group with a history of violence ($M = 24.2$, $SD = 5.52$, $n = 15$).

The relationships of extraversion, $F(1,109) = 1.66$, $p = .201$, $\eta^2 = .015$; openness, $F(1, 109) = 0.35$, $p = .558$, $\eta^2 = .003$; agreeableness, $F(1, 109) = 1.39$, $p = .241$, $\eta^2 = .013$; and conscientiousness, $F(1, 109) = 2.18$, $p = .143$, $\eta^2 = .020$, were all determined to not be statistically significant relationships when considering the presence of violence in behavioral history.

Binary Logistic Regression Model. A logistic regression was performed in order to examine the predictability of each personality factor among individuals diagnosed with schizophrenia and their behavioral history in regards to violence. As a whole, the model was found to be statistically significant, $X^2 (5, N = 111) = 12.45$, $p = .029$. This regression model was statistically significant on the neuroticism factor ($p = .008$) only, with extraversion ($p = .856$), openness ($p = .366$), agreeableness ($p = .750$), and conscientiousness ($p = .174$) not adding significantly to the model.

The analysis also produced a model summary demonstrating the range of variation within the dependent variable, between 10.6% (Cox & Snell R^2) and 19.4% (Nagelkerke R^2). For this model, the Nagelkerke R^2 is used due to it being preferential to report (Laerd Statistics, 2015). The Nagelkerke R^2 value is then acknowledged as the binary logistic regression model explaining 19.4% of the variance within violence. The model was also found to correctly classify 88.3% of cases.

Bootstrapping was performed on this model based on 1000 bootstrap samples, in order to determine whether the relationship between violence and scores on the NEO-FFI personality factors were genuine. The values discovered after bootstrapping are reported within Table 5. By comparing the previously described significance levels, the bootstrap results demonstrated similar findings regarding the significance of each personality factor. A closer look at the confidence intervals for the bootstrapping performed, demonstrates for all the factors besides neuroticism, the value of zero is present. This provides further confidence into the identification of these factors having no significant differences, resulting in no practical importance.

Table 5

Bootstrap for NEO-FFI Factors and Relationship with Violence

	B	Bootstrap		
		Sig. (2-tailed)	95% Confidence Interval	
			Lower	Upper
Neuroticism	- .168	.003	- .375	-.077
Extraversion	- .012	.847	- .169	.161
Openness	- .063	.211	- .191	.060
Agreeableness	.021	.713	- .130	.164
Conscientiousness	- .005	.913	- .133	.108

Research Questions

Research Question 1: What is the difference in neuroticism scores between individuals with schizophrenia having a history nonviolent and violent behavior?

Research Question 2: What is the difference in extraversion scores between individuals with schizophrenia who have a violent behavior history compared to those with a nonviolent history?

Research Question 3: What is the difference in conscientiousness scores between individuals with schizophrenia who have a history of violent behavior compared to those with a nonviolent history?

Research Question 4: What is the difference in openness scores between individuals with schizophrenia having a violent behavior history compared to those with a nonviolent history?

Research Question 5**:** What is the difference in agreeableness scores between individuals with schizophrenia having a history of violence compared to those with no history of violence?

The one-way ANOVA for the neuroticism scores were reviewed and found to be statistically significant when looking at the scores of nonviolent and violent schizophrenics. For the rest of the personality factor scores, extraversion, openness, agreeableness, and conscientiousness, the differences in scores were determined to not be statistically significant. Post hoc tests were not performed due to the absence of each research question only having two groups to examine, instead of the required minimum of three for post hoc tests.

Based on the statistical test results for the personality factor scores of neuroticism and the presence of violence in an individual's history, the null hypothesis, there is no significant difference in neuroticism scores between individuals with schizophrenia who have demonstrated violent behavior compared to those with nonviolent behavior history, was rejected. The null hypothesis, there is no significant difference in extraversion scores between individuals with schizophrenia who have demonstrated violent behavior and those who have a nonviolent behavior, failed to be rejected. The null hypothesis, there is no significant difference in conscientiousness between violent and nonviolent individuals diagnosed with schizophrenia, failed to be rejected. As a result of the statistical tests for openness, the null hypothesis, there is no significant difference in levels of openness between violent and nonviolent individuals diagnosed with schizophrenia, failed to be rejected. The null hypothesis, there is no difference between nonviolent and violent

individuals with schizophrenia when considering the level of agreeableness, failed to be rejected.

Research Question 6: What is the combined and relative effect of neuroticism, extraversion, conscientiousness, openness, and agreeableness in predicting violent versus nonviolent individuals?

The binary logistic regression model was used to discover statistically significant test results and examine the wellness of fit for the model. The full model included all five of the personality factors in the FFM, neuroticism, extraversion, openness, agreeableness, and conscientiousness. The examination and inclusion of all five factors within the model was found to be statistically significant. However, the neuroticism scores were found to have a genuine positive relationship when bootstrapping was performed, as seen in Table 6. The results of the other personality factors, as found by performing the bootstrapping test, demonstrated the lack of a practical importance in their differences (Laerd Statistics, 2015). There were no testable hypotheses for this question.

Summary

The scope of this study was inclusive of the scores of the FFM on the NEO-FFI and how the scores pertained to the display of violent behavior, as well as the predictability of these factors. With this research, the examination of various test results and discoveries were made. A direct relationship between neuroticism scores and the display of violence was found, while the other personality factor scores were not as significant in their relationship to violence. The research method utilized for the study was a quantitative analysis with a convenience sampling provided in a secondary data set. The resulting

participant information was analyzed using the latest version of the statistical software IBM SPSS, and were examined for statistical significance.

Multiple one-way ANOVAs were utilized to determine differences in the personality scores within the FFM. Each of the personality factors scores was analyzed along with the presence or lack of violence. Statistically significant differences were found within the personality factor of neuroticism and the variable of violence. However, there were no significant statistical differences among the other personality factors, extraversion, openness, agreeableness, and conscientiousness, when considering the presence of violence.

The final analysis included the binary logistic regression model inclusive of all five personality factors of the FFM. The full model was utilized in order to examine the contribution and predictability of each personality factor. Statistical significance was found for the model, with an emphasis on the significance of the contribution from the neuroticism score. The model was also found to be a good fit to the data, with a high predictive nature.

In Chapter 5, the purpose of the study is revisited in regards to the need to fill the research gaps in violence, personality traits, and schizophrenia. The statistical analyses of the quantitative data and the findings are compared to the existing research in the field. These analyses are used to make recommendations for future research within the area of personality traits and their predictability nature in regards to violence in schizophrenics. In final conclusion, the implications for social change are addressed with further exploration into the results of the research.

Chapter 5: Summary & Conclusions

Introduction

The purpose of this quantitative study was to determine the presence of a relationship between the five personality traits within the FFM and violence among individuals diagnosed with schizophrenia. Results of the personality assessment NEO-FFI were examined, along with the presence of violence within the history of each participant. Possible relationships among the personality trait scores and violent behavior were considered. Further investigation was performed to determine the presence of a predictability factor between the scores from the NEO-FFI and violence.

The research participants from the secondary data were of Japanese descent and were recruited from the Kanazawa Medical University Hospital in Uchinada, Ishikawa, Japan by the three researchers Ohi, Shimada, and Kawasaki. Each participant was either recruited from the inpatient or outpatient population within the hospital. Every participant was tested with the selected personality assessment, only excluding individuals having medical conditions affecting their central nervous system. This exclusion was due to the original researchers looking at phenotypes among psychiatric disorders; the exclusion was not needed in regards to this research.

The presence of violence in the behavioral history of the participants was the only dependent variable. The independent variables were the five personality factors, neuroticism, extraversion, openness, agreeableness, and conscientiousness. Multiple one-way ANOVAs, as well as a binary logistic regression model, were utilized to analyze the

data. The data analyses and graphs were constructed using the latest available version of IBM SPSS statistics software. Previous research has found some type of relationship between personality traits and violence, but whether this relationship is a strong one among all five of the personality traits within the FFM was unknown. This gap in the research was the reason for conducting this quantitative study.

Key Findings

The possibility of there being a relationship between the personality traits and the presence of violent behavior was determined by the statistical significance of the one-way ANOVAs performed. Prior to analyzing the data after collection, the extent of the relationships present among the personality traits was only anticipated within the neuroticism trait. The findings of Claes et al. (2014) and Zajenkowska et al. (2013), as described in Chapter 2, further support this expected result. Out of the five personality trait scores, the only trait having a statistically significant result was neuroticism.

The alternative hypothesis for Research Question 1, there is a significant difference in neuroticism scores between individuals with schizophrenia who have a history of violent behavior compared to those with a nonviolent history, was accepted. The alternative hypothesis for Research Question 2, there is a significant difference in extraversion scores between individuals with schizophrenia who have demonstrated violent behavior and those who have a nonviolent history, was rejected. The alternative hypothesis for Research Question 3, there is a significant difference in conscientiousness scores between individuals with schizophrenia who have a history of nonviolence compared to those who have a history of violent behavior, was rejected. The alternative hypothesis for Research Question 4, there

is a significant difference in openness scores between individuals with schizophrenia who have a behavioral history of violence compared to individuals with a history of nonviolence, was rejected. For Research Question 5, the alternative hypothesis, there is a significant difference in agreeableness scores between individuals with schizophrenia who have a history of violence when compared to those without a history of violence, was rejected.

Post hoc analyses were not performed on these research questions due to the dependent variable only having two defined groups, violence present and none. However, the normality of each of the one-way ANOVAs was tested. An examination was made to determine the predictability of violence utilizing the model inclusive of the five personality traits, as described by Research Question 6. A statistically significant result was found within the predictability of violence by using the scores from the personality trait neuroticism. No significant findings regarding the predictability of violence when using the other personality trait scores was found.

Bootstrapping was performed for this binary logistic regression model in order to determine the accuracy of the original analysis results. The bootstrap results for the variables included the finding of neuroticism being the only trait factor with a statistically significant result. This factor was even found to increase statistical significance within the bootstrapping. There were no hypotheses identified for Research Question 6, therefore there were none to accept or reject with these findings.

Interpretation of the Findings

In recent research, there has been much focus of violence among individuals diagnosed with schizophrenia (Edlinger et al., 2014; Fazel et al., 2014). However, the key

factors ignored within this particular research were the presence of the personality factors found within the FFM. Personality contribution to the displayed violent behavior of individuals has been previously researched, but only those personality assessments other than the NEO-PI, NEO-PI-R, or NEO-FFI (Dolan et al., 2013; Ohi et al., 2012; Riser & Kosson, 2013). Few of these research studies also considered the presence of a psychotic diagnosis, such as schizophrenia (Ohi et al., 2016). As a result of this quantitative study, comparisons of personality scores within the NEO-FFI and violence among individuals diagnosed with schizophrenia has been expanded and further explored.

Eysenck's (1967) theory of personality and crime, as well as Costa and McCrae's (1992a) theory of personality, were the main theories of focus within this research. To determine whether these theories were appropriate to the areas being studied, further examinations of previous research were performed. Murdock et al. (2013) had executed a research study to determine the significance of personality traits among individuals diagnosed with schizophrenia and how it effected their executive functioning. A finding of a deficit in executive functioning has connected to violence and criminal behavior, adding further support for the usage of both theories within this quantitative study.

The relationship between a history of violence and personality traits, as previously mentioned, has been explored by various research studies (Boduszek et al., 2013). Individuals presenting with a history of violent or criminal behavior were found to have five identifiable predictors of criminal thinking: psychoticism, extraversion, neuroticism, criminal friends, and criminal identity (Boduszek et al., 2013). Three of these predictors can also be identified within Costa and McCrae's (1992b) theory of personality, with two being

actually included within the FFM. The distribution of the personality factors within the individuals with violent histories was achieved (see Table 3).

Previous researchers had looked at the variation in personality traits among individuals diagnosed with schizophrenia (Boyette et al., 2013). Among these research findings, the researchers had found significant differences between individuals diagnosed with schizophrenia and their healthy siblings. Significant differences were observed within the FFM personality traits of neuroticism, extraversion, agreeableness, and conscientiousness. Within the current research study, the significance of personality factors among individuals diagnosed with schizophrenia was disconfirmed but added to prior research (see Table 4).

One aspect of this research was to explore the possibility of a predictability factor among the relationships of personality traits and violence among individuals diagnosed with schizophrenia. A correlation between the personality trait factor scores and the presence of violence was examined in order to determine the predictable nature of the model inclusive of all five factors of personality within the FFM. The model was found to be statistically significant, specifically on the neuroticism factor (see Table 5). These findings are supportive of previous findings having indicated neuroticism as having the most significant difference in scores among individuals with violent and nonviolent histories (Zajenkowska et al., 2013).

Interpretations Based on Theoretical Framework

According to Costa and McCrae's (1990) FFM of personality includes a specific distinction between five personality traits: neuroticism, extraversion, openness,

agreeableness, and conscientiousness. Each personality factor is believed to be influential to the way a person behaves, feels, and essentially thinks (Costa & McCrae, 1992a). These personality factors described by Costa and McCrae are similar to the second theoretical foundation for the research, Eysenck's (1964) theory of crime and personality. Within the theory of crime and personality, Eysenck (1964) suggested the presence of various combinations of personality traits might be the determining factor in the type of criminal behavior displayed among individuals. So, when combined with the FFM, Eysenck's theory lends credence to the combining of personality traits and behavior.

Neuroticism. The personality factor of neuroticism is considered to be a trait, which contributes to a person's ability and reaction to various stimuli (Eysenck, 1967). Furthermore, Costa and McCrae (1990) portrayed individuals as being temperamental and displaying strong emotions. Previous researchers have performed research studies in order to determine the influential nature of personality on displayed aggressive tendencies (Bobadilla et al., 2012; Kamaluddin et al., 2015). Additionally, researchers Zajenkowska et al. (2013) used the FFM personality assessments to determine the variation of personality scores among individuals displaying anger and hostility.

The concept of the neuroticism factor having a connection or correlation to the displayed behavior of individuals diagnosed with schizophrenia was the focus of the first research question. This concept was quantitatively investigated and proven to have a statistically significant in terms of a relationship, while also being statistically significant in terms of predictability. However, previous research has suggested the neuroticism scores of individuals displaying aggressive or violent behavior would be higher than those individuals

without a history of aggression or violence (Claes et al., 2014; Zajenkowska et al., 2013). This was not the finding of the present study, finding neuroticism scores were higher among individuals without a violent behavioral history.

Extraversion. The factor of extraversion is inclusive of examining the concept of socialization and a person's ability to interact with others. Costa and McCrae (1992a) initially described someone with high scores in extraversion as someone who is active in social settings, joins group activities willingly, and displays positive emotions and warmth when surrounded by others. Although the suggestions of extraversion suggest a relationship to the way an individual behaves within social settings, there has been no research to prove the presence of a significant relationship (Boduszek et al., 2013).

Further supportive of these previous findings are the results of the present study. Extraversion was not found to have a statistically significant relationship to the displaying of violent behaviors among individuals diagnosed with schizophrenia. In addition, the personality factor of extraversion did not add any significance to the model in predicting the outcome of violence or nonviolence among participants. These findings extend the observed results of the previous research studies already present in the field.

Openness. The openness factor is the third personality factor identified in Costa and McCrae's FFM. This factor is inclusive of a person's interests in new activities, as well as their present culture (Widiger & Costa, 2013). In addition, a person's creativity and curiosity are further examined within the trait of openness. Not only is creativity and curiosity the main focus, Costa and McCrae (1992a) believed the level of openness would give additional insight into a person's feelings towards various aspects of culture (Costa &

McCrae, 1992a). Although culture was not directly examined within the frame of this research, individuals having low scores on openness were found to be conservative and less sensitive to observable differences (Costa & McCrae, 1992a).

The current study's design was created to explore whether a person's level of creativity and curiosity have any relation to a display of violent behavior. Openness was not found to have a significant statistical relationship to the presence of violence within an individual with schizophrenia's history. These findings differ from the results of research performed by Claes et al. (2014), where individuals scoring lower in openness were found within the more aggressive group studied. In contrast, although the findings of this study were not significant, openness scores were higher among individuals without a history of violence.

Agreeableness. The fourth personality factor within the FFM is identified as agreeableness. Widiger and Costa (2013) described this factor as including a person's ability to have and maintain interpersonal relationships. Theoretically, individuals with a higher score on the agreeableness factor would be kind, warm, considerate, and sympathetic (Widiger & Costa, 2013). Trull (2012) described this personality trait as constantly struggling with the antagonistic nature of individuals. This antagonistic nature could further be influential to the displayed behavior of the individual in question.

The scores on the agreeableness factor within this research were found to have no significant relationship to the presence of violence in an individual's past. Nevertheless, the score findings suggest individuals with a higher score on agreeableness presented with a history of violence. This finding is in contrast with the results of research performed by

Zajenkowska et al. (2014), where individuals with aggressive behavioral tendencies were found to have lower levels of agreeableness, as well as findings by Joliffe (2013) where low agreeableness scores were related to criminal offending in males. The main difference in these two previously performed research is the lack of identifying a mental health disorder diagnosis of schizophrenia.

Conscientiousness. The last personality factor within Costa and McCrae's (1992a) FFM is inclusive of a person's level of self-control, as well as their competence level. Claes et al. (2014) described aggressive individuals as scoring low on the conscientiousness factor, suggesting these individuals have a low level of self-control, as well as being less goal oriented. Although aggression is not the same as violence, Kamaluddin et al. (2015) found a link between violent crimes and the psychological traits of personality, inclusive of low self-control. This inclusion of low self-control allows for a connection between violent crimes, aggression, and the personality factor of conscientiousness.

A statistically significant relationship between conscientiousness and violence was not found within the results of this research. Furthermore, individuals with schizophrenia achieved higher scores on this personality factor when there was the presence of violence within their behavioral history. These findings are in disagreement with the suggestion of the findings from Kamaluddin et al. (2015) and Claes et al. (2014) when aggression and criminal behavior is viewed as forms of violence. As was seen with extraversion, openness, and agreeableness, conscientiousness was not a significant contributor to the predictability of violence with the use of the FFM.

Limitations of the Study

The research participants of the secondary data were chosen from the inpatient and outpatient program from the Kanazawa Medical University Hospital in Uchinada, Ishikawa, Japan. The original researchers Ohi, Shimada, and Kawasaki chose this location due to convenience, as they are employees of the hospital. Each participant within the data provided was included in the statistical analyses. However, for reasons within their original collection procedure and participant desirability, Ohi, Shimada, and Kawasaki had eliminated individuals presenting with any neurological or medical conditions affecting their central nervous system.

As part of the original data collection, Ohi and his colleagues collected intellectual data from each participant. Although Langeveld et al. (2014) suggests considering this information in regards to the findings in neuroticism, the intellectual data provided by Ohi was not factored into the data analysis. Participants were not eliminated based on their tested intellectual capacity. By not considering the level of intelligence among the participants, the research findings may not be as accurate as they could have been.

Although the size of the population within the secondary data was deemed appropriate for the desired analyses, there may be some concern regarding the distribution of violence and nonviolence among the participants. The participants presenting with a history of violence (n = 15) made up only 13.5% of the population, while those individuals without a history of violence (n = 96) made up 86.5%, the majority of the population. The uneven distribution of the behavior history limits the outcomes ability to be fairly representative of those individuals within the selected population.

Another concern in limitations of the study is the ability to generalize to the general public. The participants within the data were all of Japanese descent. This limits the ability to potentially apply the findings to various populations, resulting in only being able to apply to those individuals of Japanese descent. Gelade (2013) suggested results of personality assessments within different cultures and locations might need to be considered only as far as the selected population. The research findings of Gelade (2013) demonstrated a clear connection of demonstrated personality traits and a person's geographical location; recommending further consideration be given to the location of those individuals tested for personality.

Another concern to the generalizability of the findings relates to the population having a diagnosis of schizophrenia. As Gelade's (2013) research described, different cultures view mental health in completely differing ways. Due to this concern, all participants within the research were diagnosed with schizophrenia by at least two trained psychiatrists using the criteria of the DSM-5 (APA, 2013). When applying these findings to populations, it is important to only apply to populations with a diagnosis of schizophrenia and of Japanese ancestry.

This quantitative study was designed in order to explore the presence and extent of the relationship between the personality factors and the presence of violence among individuals diagnosed with schizophrenia. The design was inclusive of analyses of variance to examine these relationships, with the results providing validity in what they were meant to assess. However, these results did not explain the full extent of the relationships between

violence and the personality traits within the FFM. The findings merely described whether there was the presence of a statistically significant relationship.

Further concerns for the validity of the results include those values at an abnormal distance from the others values noted within the personality trait factor scores of neuroticism, extraversion, agreeableness, and conscientiousness. These values can be seen in the Figures 1, 2, 4, & 5. The outlier values were not taken out of the data analysis due to an already low participant population. By not taking these values out of the analyses performed, the results may have been different in comparison to the relationship of violence with the personality traits.

Recommendations

There is no definitive answer to the question of why some individuals are more violent than others. However, there has been research performed which have identified factors found having some form of relationship with violence, such as personality traits within the FFM (Citrome & Volavka, 2015; Claes et al., 2014; Pechorro et al., 2013; Skeem et al., 2016). Unfortunately there were no research studies within the current literature where analyses were performed to examine the spread of personality trait scores among individuals diagnosed with schizophrenia, and then considering the level of violence within their behavior.

There are beliefs among the general population of individuals diagnosed with schizophrenia, or other psychotic disorder, are more likely to display violent behaviors (Edinger et al., 2014; Fazel et al., 2014). This idea was not fully addressed within the current research analysis, an area of concern maybe to be attended to in future research

within this area. However, within the sample of 111 participants diagnosed with schizophrenia, only 15 displayed violent behaviors or had displayed violent behavior in the past. The fact there was such a low percentage of the participants having violent behavior (13.5%), suggests further research would need to be performed in order to fully discredit the idea of individuals suffering from schizophrenia as being more violent than the general population.

The conclusions of this current research produced some unexpected results among the personality factor scores and their significance among each participant group related to violence. The findings of research performed by Boyette et al. (2013) demonstrated a general conclusion of individuals diagnosed with schizophrenia as having higher scores in neuroticism, and lower scores on the extraversion, agreeableness, and conscientiousness personality factors. Further research is needed in order to determine whether this base scoring for schizophrenic individuals is something influencing the displaying of violent behaviors.

Even though the findings of this research resulted in surprising conclusions, the relationship present between neuroticism and violence in schizophrenia was still demonstrated. The definition of violence could have limited the findings, as there has been research to find significant relationships between violent and nonviolent crimes and personality (Boduszek et al., 2013), as well as aggression and personality (Hosie et al., 2014). Additional research on the differentiation between aggression, crime, and violent behavior may provide further insight into how personality affects each differently and similarly.

By examining the results of the current study, Costa and McCrae's (1990) theory of personality as applied to individuals diagnosed with schizophrenia was supported. However, the same should not be said for Eysenck's (1967) theory of personality and crime. The reason for not applying Eysenck's (1967) theory relates to the idea of not every violent behavior is criminal, and the concept of not all violent individuals has been convicted of a violent crime. A distinction should be resolute when applying this theory to behaviors. Possibly, Eysenck's (1967) theory should only be utilized within participant pools inclusive of criminal history, and then breaking down the crimes into violent and nonviolent offenses in order to explore the relationship of the behavior and personality.

Dr Ohi and his colleagues had originally gathered intellectual information on the participants utilized within this research study. However, this intellectual information was not provided to this researcher as part of the secondary data set. Sutin et al. (2013) suggested including an individual's intellectual capacity when utilizing personality assessments, based on the impression the openness measure has some linguistically complex wording. This complexity could have skewed, or had some affect, on the answers provided by the participants within the initial research, especially if some participants had lower levels of literacy (Sutin et al., 2013).

The ability to predict certain behaviors utilizing the FFM has been demonstrated by O'Riordan and O'Connell (2014). These researchers demonstrated findings where personality was found to be a better predictive measure in criminal involvement, compared to the socio-economic measures generally utilized in the field of criminology (O'Riordan & O'Connell, 2014). Results from the current research study provide further consideration to

the inclusion of personality aspects when exploring the predicted outcome of an individual's behavior. The binary logistic model utilized within the current research study demonstrated a statistically significant application to being able to predict the outcome of violence or nonviolence among the population. However, additional research should be performed in order to fully be able to use this model when predicting the presence of violence within an individual's behavior history.

Although the individual facets of each personality trait were not investigated in the current research study, the answer to the unexpected results of personality may be found within them. The additional research performed in investigating the facet scores on the neuroticism may provide findings more appropriately utilized in predicting violence. Also, these personality facets may explain the variations in scores between males and females with schizophrenia.

A final recommendation for further research in this area of study relates to the gender and age of the participants. Neither of these was considered in the actual analyses of the research study, however each gender was represented and the participant's age was required to be over 18 years old (see Table 1). Miralles et al. (2014) suggest the personality traits of the individuals with schizophrenia may actually be different between the genders, a notion supported by previous research by Borkenau et al. (2013). This advises the general findings of a significant relationship between violence and neuroticism may only be accurate when looking at one gender. Further investigation needs to be performed to address the difference in genders, and to see if these differences have an affect on the displayed personality factors among individuals diagnosed with schizophrenia. These potential

findings would contribute to the continued research on finding ways to predict violent recidivism in populations.

The same concerns outlined by Miralles et al. (2014) regarding the gender of participants, can also be applied to the age of the participants. Debast et al. (2014) found within their research on personality where individuals go through certain changes between the age of adolescence and 30 years old. These possible changes had also been identified by Costa and McCrae (1992a), but were not considered in the current research study due to limited participant population. However, if the personality of individuals has the potential to be unstable before the age of 30 years old, further research involving personality traits, schizophrenia, and displayed behaviors may wish to only consider those of the age of 30 or older.

Implications

The current research method was designed with an effort to examine the possible relationship between personality traits and the presence of violent behavior among individuals diagnosed with schizophrenia. Further consideration was also given to the predictable nature of the personality trait scores from the NEO-FFI and the resulting behavior. The ability to predict certain behaviors, as not yet attained, is something, which would be beneficial to many aspects of various fields, including criminology and psychology. However, the findings presented from the current research study should not be considered as all inclusive. Additional research is needed in order to put this concept into action.

Preferably, with the performance of additional research in the areas mentioned in the previous section, different companies and groups would benefit in knowing whether there is a relationship between specific personality traits and the behavior displayed by the individuals in question. For example, a relationship found between neuroticism and the presence of violence may shed more light on how individuals with schizophrenia internalize the personality specifics of the factor. These relationships could be found to be differing among various cultures and require the use of different assessments of personality.

Hosie et al. (2014) gave additional encouragement for studies into observed behaviors with the utilization of personality assessments. They described the benefit of knowing the relationship between displayed behavior and personality, and how practitioners could consider these relationships when determining proper treatment protocols (Hosie et al., 2014). As discussed by Miralles et al. (2014), psychoeducational and psychosocial interventions for individuals diagnosed with schizophrenia should be considered on the basis of gender and the personality trait findings. These interventions have the potential of also identifying those individuals with a great risk of hospitalization or suicide attempt (Miralles et al., 2014)

Not only within the practice of psychology, Hosie et al. (2014) also suggested intervention methods may become more effective if additional research is given to designing more precise personality assessments. With the statistically significant relationship found between neuroticism and violence within the current research study, these results have the potential to be utilized in designing screening tools. Such tools include the ability to predict

criminal recidivism among adults (O'Riordan & O'Connell, 2014), a greater predictor than the current socio-economic measures being utilized.

After performing the research and analyzing the acquired data, the use of the information essentially adds to the minimal amount of research already available. The use of already existing assessment tools within personality traits is beneficial to any researcher already accustomed to using the well known NEO-PI-R or NEO-FFI. Although these assessment tools require a trained professional to administer them, their validity, reliability, and generalizability have been well established across multiple cultures and ages.

Ultimately, the intention of this research was to add to a limited knowledge base of schizophrenia, violence, and personality traits. The progress towards positive social change from the results of the performed research is present and seen in the recommendations for future research in the area. By using these results to further research, the possibility for practitioners to develop and design more accurate and appropriately fitting intervention options has grown. These results have provided a stepping-stone closer to understanding the variation in personality traits among individuals diagnosed with schizophrenia.

Conclusion

The significance of positive social change from the results of the current research has the potential to be great. Violent behavior, often seen in the form of criminal behavior, is abundant all over the world, and affects society as a whole. If a relationship or predictable model can be found, the recognition and intervention of these violent behaviors may be established, resulting in a safer society. These benefits would be seen across various aspects of populations, such as less mental health patients in jail settings.

Even though previous research has determined a relationship between neuroticism and violence where violent individuals have a higher level of neuroticism, the results of this research have shown this to not always be the case. This result challenges previous findings, but also provides evidence of the need for further research. The concept of using personality as a predictor of violent behavior adds to the educational benefits and diagnostic outcomes regarding individuals diagnosed with schizophrenia.

The future direction for this area of research includes the use of a larger participant population in order to determine, on a greater level, the significance of neuroticism in its relationship to violence. Furthermore, the fact of personality being a great predictor of violence is supported by the results of this research. Though the results of the current research did not provide definitive answers to the relationships and predictability of personality traits, the findings have provided future pathways into research inclusive of the FFM, schizophrenia, and violent behavior.

In future studies, further exploration into the use of personality traits in designing treatment options with a more personalized aspect not previously made available. Gaining a better understanding of how personality traits within the FFM can influence or have an affect on violence will not only offer additional understanding of this phenomenon, but also benefits to those individuals diagnosed with schizophrenia and the general population. Although further research will need to be performed in order to pinpoint the exact sub facets within the FFM personality traits having predictability aspects, the foundation to the work and benefits has been discovered with the investigation of this research study.

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Appendix A: Permission Letter for Research Data

September 20, 2016

Dear Dr. Kazutaka Ohi,

My name is Ashley Lust-Morton and I am a doctoral student at Walden University in the Forensic Psychology program. As part of the requirements for the completion of my PhD within Forensic Psychology, I am designing and conducting a dissertation research project under the guidance and supervision of my dissertation chair, Dr. Sandra Caramela-Miller, my methods specialist, Dr. Charles T. Diebold, and the university research reviewer, Dr. Victoria Latifses. The title of this research is "Five Factor Personality Traits in Schizophrenics with Criminal Behavior History".

I came across the meta-analysis performed by you and your colleagues, "The Five Factor Model personality traits in schizophrenia: A meta-analysis. The research within this meta-analysis has two variables and aspects I am interested in: the diagnosis of schizophrenia among the individuals, and their scores on the NEO-FFI (Costa & McCrae, 1992). I am hoping to find some sort of relationship between these two variables, and the their criminal history. With your permission, I would like to utilize the data you had gathered and was utilized within this meta-analysis. You will receive complete acknowledgement and credit regarding the data being used. Furthermore, I would protect the raw data and would not provide it to any researcher who may ask.

My question regarding the use of the data is whether you are the final 'owner' of this research data, or if there are other individuals or organizations I may need to contact. The Internal Review Board (IRB) at Walden University is willing to give a conditional approval

and generate a letter to be sent to you and anyone else for further confirmation. If you are the only owner of the data, the data usage agreement attached needs to be physically signed and a copy either emailed to the IRB directly at irb@waldenu.edu or faxed to (626) 605-0472. I have attached the data usage agreement to this letter.

Please contact me if you have further questions regarding my interest in the data in question. I have provided both my email address and my personal phone number. Please do not hesitate to contact me. I am looking to start data analysis as soon as possible, meaning the sooner I hear back from you the better. I greatly appreciate you taking the time to respond and potentially helping me in my pursuit of my doctorate. Thank you for your time.

Best,

Ashley Lust-Morton

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