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Personality and Crime: An Examination of the Influence of the Five Factor Model on Offending and Co-Offending

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PERSONALITY AND CRIME: AN EXAMINATION OF THE INFLUENCE OF THE FIVE
FACTOR MODEL ON OFFENDING AND CO-OFFENDING

A Dissertation

Submitted to the School of Graduate Studies and Research

in Partial Fulfillment of the

Requirements for the Degree

Doctor of Philosophy

Kenethia L. McIntosh Fuller

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The study was an effort to gain insight into the relationship between personality factors and offending. The personality factors included in the study were Openness, Conscientiousness, Extraversion, Agreeableness, and Neuroticism (OCEAN). It was hypothesized that OCEAN would significantly impact offending and co-offending among an adult sample of college students. Also, an effort was made to show that OCEAN could significantly differentiate between individuals who did not offend at all, individuals who offended alone, and individuals who participated in co-offending.

Personality was measured using the Big Five Inventory, and offending was measured using an adaptation of Elliott and Ageton's (1980) self reported delinquency scale. Various types of offending were examined. An online survey of 305 college students provided the data for analysis. To test the hypotheses, a variety of statistical methods including OLS regression, logistic regression, ANOVA and multinomial logistic regression we applied. There was some support for the relationship between certain personality factors (conscientiousness and agreeableness) and offending. Agreeableness was the only factor shown to be significantly associated with co-offending. Agreeableness and conscientiousness were significantly able to differentiate between non offenders and co-offenders.

The results contribute to the body of knowledge by focusing on internal explanations for offending, and by studying a wide variety of offenses rather than one specific type of offending. The most unique aspect of this study was the comparison of several different types of offenders (non offenders, solo offenders, and co-offenders). Future research should more closely examine the individual level explanations behind co-offending behaviors as well as including more mainstream criminological theories in the analysis.

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TABLE OF CONTENTS

Chapter		Page
One	INTRODUCTION	1
	Background of Personality and Criminology	2
	FFM and Crime.....	4
	Co-Offending	6
	The Current Study	8
Two	LITERATURE REVIEW	11
	The Role of Mainstream Criminology	11
	Origins of FFM.....	16
	Personality and Criminal Behavior.....	18
	Review of Relevant Literature	22
	Co-Offending	45
	The Present Study.....	55
Three	RESEARCH METHODS	59
	Research Design	59
	Research Questions and Hypotheses	60
	Independent Variable	66
	Dependent Variables.....	71
	Control Variables	73
	Sample	76
	Sampling Procedure	76
	Human Subject Protections	78
	Method of Data Analysis.....	80
	Analytical Plan.....	88
Four	RESULTS	90
	Phase 1	91
	Phase 2	114
	Phase 3	129
	Results Summary	139
Five	DISCUSSION AND CONCLUSION.....	141
	Offending.....	142
	Co-Offending.....	144

Chapter	Page
Methods.....	145
Conclusions.....	146
Findings for Personality and Offending.....	146
Findings for Personality and Co-Offending.....	150
Difference between Non-Offenders, Solo Offenders and Co-Offenders.....	152
Limitations.....	155
Policy Implications.....	157
Recommendations for Future Research.....	159
REFERENCES.....	163
APPENDICES.....	174
Appendix A. Survey Initial Email.....	176
Appendix B. Survey Invitation Email.....	177
Appendix C. Survey Follow-Up Email.....	180
Appendix D. Survey Thank-You Email.....	183
Appendix E. Survey Questionnaire.....	185

LIST OF TABLES

Table	Page
1 <i>Hypothesized Relationship between Personality and Offending</i>	63
2 <i>Hypothesized Relationship between Personality and Co-Offending</i>	66
3 <i>Summary of Research Analysis Plan</i>	89
4 <i>Comparison of Descriptive Statistics for Student Population and Sample</i>	92
5 <i>Reliability Analysis of the Openness Scale</i>	95
6 <i>Reliability Analysis of the Conscientiousness Scale</i>	97
7 <i>Reliability Analysis of the Extraversion Scale</i>	98
8 <i>Reliability Analysis of the Agreeableness Scale</i>	99
9 <i>Reliability Analysis of the Neuroticism Scale</i>	101
10 <i>Descriptive Statistics for Personality Scales and POMP Transformations</i>	102
11 <i>Zero-order Correlations of Personality Scales</i>	103
12 <i>Reliability Analysis of the Social Desirability Scale</i>	105
13 <i>Correlations between Social Desirability and Personality Factors</i>	107
14 <i>Descriptive Statistics of Offending Variables</i>	110
15 <i>Descriptive Statistics of Co-Offending Variables</i>	112
16 <i>Descriptive Summary of Solo and Co-Offenders by Type of Co-Offending</i>	113
17 <i>Bivariate Regression</i>	115
18 <i>Correlations among Independent Variables</i>	115
19 <i>OLS Regression Results Measuring the Impact of the FFM on Offending Against Persons</i>	121
20 <i>Casewise Diagnostics for Offending Against Persons</i>	123

21	<i>OLS Regression Results Measuring the Impact of the FFM on Property Offending</i>	125
22	<i>OLS Regression Results Measuring the Impact of FFM on Analogous Offending</i>	126
23	<i>OLS Regression Results Measuring the Impact of the FFM on Analogous Offending after Backward Elimination</i>	127
24	<i>OLS Regression Results Measuring the Impact of the FFM on Public Disorder Offending</i>	128
25	<i>OLS Regression Results Measuring the Impact of the FFM on Illegal Service Offending</i>	129
26	<i>OLS Regression Results Measuring the Impact of the FFM on Drug Offending</i>	130
27	<i>OLS Regression Results Measuring the Impact of FFM on Offending</i>	131
28	<i>Summary of OLS Regression Models</i>	133
29	<i>Logistic Regression Results Measuring the Impact of Personality Factors on Property Co-offending</i>	136
30	<i>ANOVA Table of Personality Factors and Types of Offenses</i>	137
31	<i>Multinomial Logistic Regression of Personality Factors and Types of Offenders as Compared to Co-Offenders</i>	139
32	<i>Multinomial Logistic Regression of Personality Factors and Types of Offenders as Compared to Non Offenders</i>	140
33	<i>Classification Table for Multinomial Regression</i>	143

CHAPTER ONE INTRODUCTION

The current study has a threefold purpose. First, the focus of the study was an examination of the relationship between personality and offending behavior using Costa and McCrae's (1985) Five Factor Model (FFM) of personality. Second, personality factors were studied to determine if specific factors effect whether an individual participates in different types of offending. Third, the focus of the study was an exploration of the relationship between the FFM of personality and co-offending, which refers to offenses committed with other individuals.

The FFM is the chosen personality typology because of its current dominant position in the field of psychology as the most comprehensive model of personality. The five factors as conceptualized by Costa and McCrae (1985) are Openness, Conscientiousness, Extraversion (or Extroversion), Agreeableness, and Neuroticism, which form the acronym OCEAN. Openness refers to an individual who has broad interests and is imaginative and intellectually curious. Conscientiousness describes someone who is viewed as hardworking, ambitious, diligent, and well organized. Extraversion refers to a person who is outgoing, friendly, affectionate, and talkative. Agreeableness is meant to describe someone who is trusting, sympathetic, and cooperative. Finally, neuroticism characterizes someone who worries, is insecure, and more likely to experience psychological distress or depression.

To accomplish the purposes of this research, the current study was implemented with a quantitative design. A self report survey was administered to college students. The questionnaire consisted of a personality inventory and questions on control

variables. Participants were also asked to answer questions about personal deviant behavior and whether those behaviors were committed alone or with others. Offending was measured using Glaser's (1967) typology and range from offenses against persons and property to public service offenses and drug offenses.

The main contribution of this research was the examination of two issues that have not been fully explored in criminal justice research. Neither co-offending nor the impact of personality psychology on offending behavior has received thorough examination in the existing literature, which was discovered to be unbalanced and incomplete, and there is much that still needs to be explained. This study was an attempt to shed light on the relationship between individual characteristics and offending, but also on the individual characteristics that can lead to the commission of offenses within groups. A brief summary of the existing literature follows.

Background of Personality and Criminology

Early criminology study was formed around the medical model of crime that treated crime as the result of a disease or mental ailment that could be cured or treated. Early in the 20th century William Healy (1915) examined juvenile delinquents and found that emotional problems were the root cause of their poor behavior. Other researchers used a variety of personality tests to show that criminal behavior was the result of a personality disorder.

As using the results of personality testing became more refined and sociological theories of crime and deviance became the main focus in explaining crime, the Chicago School was created at the University of Chicago to study criminal behavior (Williams & McShane, 2004). Williams and McShane asserted that the main cause of criminal

behavior was the social environment that surrounded an individual. Rafter (2006) asserted Williams and McShane were sociological theorists who felt it was their “political and moral duty” to get away from the biological determinism that previously existed in the discipline.

It was not until the release of Eysenck’s book, *Crime and Personality* (1964) that psychological theory began to emerge again as a serious contender in the explanations for criminal behavior. Eysenck’s theory was a bold challenge to the dominant sociological explanations (Rafter, 2006). Eysenck laid out a theory that described the relationship between personality and criminal behavior. He developed three categories of personality: psychoticism, extraversion, and neuroticism (or PEN). Eysenck argued psychotics were aggressive and impulsive, extraverts were outgoing and talkative, and neurotics were emotional and easily upset.

Research articles have examined the relationship between PEN and crime. Several articles have documented support for the idea that individuals having high scores in extraversion have been determined to be more likely to engage in criminal behavior (Alexio & Norris, 2000; Burgess, 1972; Price, 1968). Similarly, several studies have indicated a correlation exists between neuroticism and crime. This suggests that individuals who have high scores in the area of neuroticism have a greater likelihood of engaging in criminal behavior (Bartol & Holanchock, 1979; Burgess, 1972; Eysenck & Eysenck, 1971).

Despite the positive correlations stated in the previous paragraph, there have also been studies that indicated a lack of support for the stated results. Some studies were unable to find any support that suggests a relationship between extraversion and

crime (Bartol & Holanchock, 1979; Eysenck & Eysenck, 1971). There have also been studies that were unable to establish a relationship between neuroticism and crime (Alexio & Norris, 2000; Mak, Heaven, & Rummery, 2003; Rushton & Chrisjohn, 1981). In summary, the relationship between PEN and crime has generated mixed results in empirical research.

FFM and Crime

The lexical hypothesis suggests that most personality traits and characteristics are already encoded into our everyday language. The words that people use to describe others and themselves are essentially a finite, yet extensive list of possible personality traits and attributes. Since the time of Eysenck's (1964) groundbreaking publication, several researchers and psychologists have examined his list of personality traits, along with other classifications of personality traits. The resulting factor analysis of all available terms to describe personality traits from a number of different sources repeatedly yielded five broad factors of personality, not just the three factors proposed by Eysenck (Matthews & Deary, 1998). This FFM makes no assumption about the causes of the existence of certain traits (Engler, 2003). The five factors are the same factors mentioned previously: Openness, Conscientiousness, Extraversion, Agreeableness and Neuroticism (OCEAN). To ensure the most current developments in the field of personality psychology are represented, this FFM will be utilized in the current study.

Despite the changes in personality theory, the study of personality and crime did not change at the same rate. To date, there are still few studies that examine the relationship between OCEAN and criminal behavior. The use of this new model may

help to continue to advance the exploration of personality and crime. Though there have been only a handful of studies, the results have been mixed. Openness has generally shown to be positively correlated to crime, but not often significant (Miller & Lynam, 2001); however, Clower and Bothell (2001) found openness is negatively correlated with arrests. Extraversion also has mixed results in the literature. Laak, deGoede, Aleva, Brugman, van Leuven and Hussmann (2003) found that extraverts were more likely to commit status offenses, while Voller and Long (2010) found that rape perpetrators had lower scores on extraversion.

For the other three factors, the results have tended to be more consistent. Conscientiousness and agreeableness have both been repeatedly shown to be negatively related to criminal behavior (Hornsveld & de Kruyk, 2005; Laak et al., 2003; Wiebe, 2004; Voller & Long, 2010). Neuroticism has been shown to be positively correlated to causing property damage (Laak et al., 2003), sexual violence (Hornsveld & de Kruyk, 2005) and use of aggression (Hines & Saudino, 2008).

While past empirical research on the relationship between personality and crime has provided a number of important findings, the literature is also limited in many ways. The majority of individuals examined in relationship to personality and crime have been incarcerated offenders (Alexio & Norris, 2000; Bartol & Holanchock, 1979; Berman & Paisey, 1984; Blackburn, 1971; Eysenck, 1970; Listwan, Voorhis, & Ritchey, 2007). As such, they are not an ideal study group due to the uncertainty of the effect of incarceration on the mental health or mental state of prisoners. Research has shown that it is possible that the status of being institutionalized changes the personality of the offender (Bohm, 2001). In addition, everyone who offends is not necessarily

incarcerated, while everyone who is incarcerated is not necessarily an offender. To address this shortcoming, the current study will utilize a sample of “normal” college adults.

Co-Offending

Co-offending is easily defined as committing criminal acts with more than one offender (Van Mastrigt & Farrington, 2009). Criminological research supports the idea that the learning of criminal behavior takes place through association with peers (Akers, 1998; Curry, Decker & Egle, 2002; Lanza-Kaduce & Capece, 2003). In the present study, the importance of the individual in criminal offending is excluded from consideration. This issue needs to be approached from two separate angles. Criminal behavior in social settings should continue to be examined, as well as the effect of individual-level explanations.

Several approaches have been utilized in trying to explain co-offending. Some research has attempted to examine how co-offending groups are formed. Many researchers have used differential association to determine whether co-offending can be explained by association with delinquent peers. In particular, the ideas of social learning encompass the idea that association with delinquent peers will then lead to engagement in criminal activities. Some researchers propose that an individual who has criminal friends or is surrounded by offenders would be most likely to co-offend (Stolzenberg & D’Alessio, 2008). Weerman (2003) explained co-offending as an exchange of goods and services between individuals. In this process, offenders commit crime together either for material payments or for social recognition. McCarthy, Hagan & Cohen (1998) took another approach that explained co-offending as the result of

collective rationality. They contended that offenders realize that, at times, getting what they want would necessitate that others were involved and would also benefit from the crime.

One of the shortcomings of the literature is evidenced that, despite the information that currently exists on co-offending, some important questions remain unanswered. Even if the ideas of differential association are correct, one needs to ask what it is about an individual that leads to association with criminal or offending friends. If co-offending is the result of a measured decision or even of an exchange for necessities, the issue of what causes or drives an individual to enter into a criminal agreement with others still has not been answered. Perhaps an individual-level explanation is most helpful to determine what particular traits are present in people who are likely to offend with others. The study of personality and co-offending may offer the solution to this problem.

Another of the shortcomings of the existing co-offending literature is the reliance on juvenile populations as the sample for study (Conway & McCord, 2002; Erickson, 1971; Erickson & Jensen, 1977; Pettersson, 2005; Warr, 1996). Research suggests that co-offending is a characteristic of juvenile populations and explains why crime peaks during the adolescent and teenage years (Reiss & Farrington, 1991; Stolzenberg & D'Alessio, 2008; Warr, 1996). Despite this fact, there have been studies that included adult samples, with some covering individuals age 80 and above (Carrington, 2002; Hodgson, 2007; Reiss & Farrington, 1991). The current study is an effort to expand on the literature utilizing adult populations by examining only individuals above the age of 18.

The Current Study

In light of all the previous research, two important questions emerge. How much offending or co-offending can be explained by individual-level factors? Can the exploration of personality differences between people who always offend with others, those who offend alone, those who sometimes offend alone and with others, or those who refrain from offending at all effect the individual-level explanations? The intent of the present research was to answer these questions.

The relationship between the FFM of personality and deviance was tested using linear regression. A personality inventory determined whether individuals with certain personality types were more or less likely to engage in offending. The study also was an exploration of whether individuals with certain personality types are more likely to engage in specific types of offending. Based on past research, one of the hypotheses examined was that individuals with higher scores on conscientiousness and agreeableness would be shown to be less likely to commit offenses. In addition, those people with higher scores on neuroticism would be shown to be more likely to commit offenses.

The current study was an examination of the relationship between co-offending and personality. After determining whether there was a significant relationship, the previous two sections were combined. The goal was to determine if people with certain personality types were more likely to offend in groups, alone, with others and alone, or not at all. (For example, is someone who is extraverted more likely to offend in groups? Is someone who is introverted more likely to offend alone?)

There were three main strengths of the current study that built upon or went beyond previous research. First, this study not only was an examination of the relationship between personality and offending, but it also was an effort to compare individuals who commit different types of offending using the FFM. This study was not limited to examining a specific type of offending such as violence, property crime, or drug use as many previous studies have done. The details of six different types of crimes/offending in one study were provided. In addition, the FFM, which is the most widely accepted personality typology, was the proposed personality measure.

Second, this study was an examination of co-offending using individual-level factors. To date, few researchers have sought to understand the impetus behind co-offending. Even fewer researchers utilized individual-level explanations, but instead focused on social factors for co-offending in explaining differences among individuals exposed to the same social factors. In addition, personality has been utilized to determine the impact of individual factors of offending and co-offending, rather than utilizing outside social forces

Third, the current research was an effort to divide offenders into three groups. Rather than simply studying solo offending or co-offending, this methodology was an attempt to differentiate between non-offenders, solo offenders, and co-offenders. These three groups were compared to determine if there were personality factors or individual differences that could distinguish between each of the four groups.

To provide relevant background information on this topic, the following chapter is a brief explanation of the FFM of personality as well as prior research on personality and offending that was utilized in this study. An understanding of the concept of co-

offending and review past research on the topic was included. Chapter Three details the methodological practices employed to implement the proposed research and explain the hypotheses and analysis plan in detail. Chapter Four details the statistical analysis and findings of the study. The final chapter is a discussion of the findings of the study as well as the limitations. In addition, policy recommendations and suggestions for future research are also presented.

CHAPTER TWO LITERATURE REVIEW

Prior to discussing the research, and in light of the information presented in Chapter One, a clear idea of the concept of personality is required. Over time, this concept has grown and changed drastically from its origins. What follows is a brief introduction to personality and trait theories. The ideas and points that are essential to understanding the significance of the current study are presented in a simplified format.

For the purpose of this study, a definition of personality offered by Larsen and Buss (2002) was utilized. The definition seems to encompass all of the components of the definition that have been discussed throughout the history of personality discourse. Larsen and Buss (2002) defined personality as “the set of psychological traits and mechanisms within the individual that are organized and relatively enduring and that influence his or her interactions with, and adaptations to, the environment (p. 4).” Traits are commonly delineated in two distinct ways. First, a trait can have a causal definition and refer to something internal that causes an individual to behave in certain ways. A trait can also refer to the way in which we summarize the behaviors exhibited by another individual. With this descriptive view of traits, there are no assumptions made at all as to the underlying reasons for an individual’s behavior (Larsen & Buss, 2002).

The Role of Mainstream Criminology

Various criminological theories have been used to explain the underlying causes of crime. These theories range from classical deterrence, to social structure theories, to social process theories. Each theory has contributed greatly to the body of knowledge in criminology; however, not all were adequate for the current study. What follows is a

brief examination of a few of the more well known criminological traditions, complete with main concepts and limitations in applicability to this research.

Self Control Theory

The theory of self control as presented by Gottfredson and Hirschi (1990) begins with the assumption that all humans are hedonistic and want immediate gratification. The issue to be addressed is to determine what prevents individuals from following their natural desires and refrain from participating in crime and deviance. Gottfredson and Hirschi (1990) determined that every person has a certain amount of self control, which is instilled early in life and is relatively stable throughout the life course. Those individuals with low self control are more likely to engage in criminal or deviant behaviors. There are six characteristics of low self control individuals. Those with low self control need immediate gratification, prefer simplicity and easy work, are very physical and keep active, have a desire to take risks, are self-centered, and are easily angered.

While it may seem that self control theory is an excellent foundation for the current research, Romero, Gomez-Fraguela, Luengo, and Sobral (2003) contended the components or characteristics that make up low self control are also similar to personality factors in the Five Factor Model. Risk seeking is most highly correlated with extraversion (.61, $p < .001$). Volatile temper or anger is most highly correlated with neuroticism (.60, $p < .001$). Simplicity or simple tasks is most highly correlated with conscientiousness (-.58, $p < .001$). Self-centeredness is most highly correlated with agreeableness (-.46, $p < .001$), and physicality had a weak correlation with openness (-.20, $p < .01$). Each self control characteristic is correlated with more than one personality

factor, though only the highest correlations are discussed here. For example, risk seeking was also correlated with aspects of openness (.51, $p < .001$) and conscientiousness (-.40, $p < .001$), but to a lesser degree. The same follows for all other characteristics of self control.

When comparing self control to the FFM, none of the self control characteristics are easily simplified into one personality factor. Instead, each self control characteristic is essentially made up of various aspects of the five factors of personality. Referring to self control as a personality trait is not new. Several researchers have referred to self control as traits or personality (Gibbs & Giever, 1995; Gottfredson & Hirschi, 1990; Wood, Pfefferbaum & Arneklev, 1993). With this in mind, the most sense is to test the full model of personality rather than just parts of personality by utilizing a widely recognized and accepted model.

Social Learning

Social Learning Theory assumes that criminal behavior is learned in the same way as conforming behaviors, with the only difference being the weight of the social influences for a particular behavior (Akers, 2000). The key concepts of the theory are differential association, definitions, differential reinforcement, and imitation. Akers suggested there are three processes in learning crime. First, individuals are differentially exposed to definitions that are more favorable to violation of criminal law. These definitions are learned through both imitation and observational learning. Second, individuals are differentially reinforced, either positively or negatively, towards criminal behavior. Third, individuals commit crimes because they are imitating the behavior of others close to them who also commit criminal behavior that is reinforced.

With the passing of time, it is not the imitation that becomes important, but the reinforcements. Deviance is more likely to occur when four main variables – differential association, differential reinforcement, imitation, and definitions – are combined, balanced, and strengthen nonconformity (Akers, 1998).

While social learning theory has added much to the understanding of the etiology of criminal behavior, one may also argue that social bonds only form as a result of personality traits. Gottfredson and Hirschi (1990) concurred that deviant acts may come about as a result of peer interaction. However, they also argued that social control is “a major factor in determining the quality of relations among the members of such groups” (Gottfredson & Hirschi, 1990, p. 157). If this assertion is accurate, then it is more advantageous to the discipline to study the root cause of group membership as well as the root cause of deviant involvement.

Biological Theories

Biological theories of crime explore the relationship between crime and various biological factors such as DNA, neurotransmitters, brain activity, hormones, biochemical differences, and neurophysiology, among other processes. Some biological theories also include the analysis of personality disorders or psychobiology. A more modern approach to the issues of biology and crime is biosocial criminology, which suggests that human interaction is a result of individual characteristics or predispositions interacting with the environment (Walsh & Beaver, 2009). Under the umbrella of biosocial criminology are both behavioral genetics and sociobiology. Behavioral genetics is the study of both genetic and environmental influences on individual traits.

Sociobiology is the suggestion that behavior is a result of biological evolution in behavioral traits of humans that can be adapted to various situations.

In contemporary research, biology is not studied in a vacuum. Much biological research on crime and deviance also incorporates other disciplines such as psychology to determine how different systems work together or influence each other. Biological theory also helps explain cross cultural crime where sociological theories may be very limited. To include biological perspectives in the current research requires the different approach of hard science rather than the social science of criminology. Even if the interaction between genetics and the environment are examined, the methods of study would have to be family studies, twin studies, adoption studies, or experimental studies (Jeffrey, 1988). To clarify the relationship between personality and crime is only one small part of the puzzle that is examined in biological/biosocial theories. However, it is one step that can help to develop a new understanding of the relationship between individuals and crime.

Summary

Mainstream criminology has a tendency to be dominated by sociological and classical approaches to studying deviant behavior. These approaches also tend to study deviant behaviors in reference to peers and other social influences. While much has been gained from these perspectives, they also may offer an incomplete picture of the reality of the relationship between individuals and the reasons for participation in deviant behaviors. If new insight can be gained from biological theory, one can assume that it is the presence of individual characteristics that influences reactions to environmental stimuli. Deviant behavior can only be understood as an individual

phenomenon, not a social problem. Since the methods for biological study are out of reach for many social scientists, perhaps an examination of traits through personality psychology is warranted.

Origins of the FFM

Originally, personality trait theory began with what is referred to as the lexical hypothesis. The main idea of this hypothesis is that most personality traits and characteristics are already encoded into our everyday language. The words that we use to describe others and ourselves are essentially the finite, yet extensive list of possible personality traits and attributes.

The first researchers to attempt to organize the lexical list were Allport and Odbert (1936). They conducted a lexical study of all personality terms in the dictionary to come up with a list of 18,000 terms. In trying to order such a massive list, they also came up with four categories in which to group the terms. Traits, states, evaluative judgments of personal conduct, and physical characteristics were included in the list.

Traits referred to one's general tendencies. These are consistent and stable ways of interacting with the external environment and refer to terms such as sociable, aggressive, or fearful. States are temporary moods such as being afraid, rejoicing, or elated. The third category consisted of words that supposed an evaluation of judgment of one's character and /or conduct. However, it is important to note that these words do not explain an individual's specific traits/attributes that led to such an evaluation by other people, such as irritating, worthy, or average. The final category referred to physical characteristics, talents, and any additional words that do not fit into the other three categories.

Cattell (1943) drew on the work of Allport and began with Allport's subset of 4,500 trait terms to try to better classify personality traits. Due to technological limitations of the time, there was no acceptable way to reduce such a large list using statistical processes. The list was therefore reduced to approximately 200 after grouping all synonyms and eliminating rare terms (Hall & Lindzey, 1970). Cattell was able to then reduce the list to 35 variables, which he then further reduced to 16 factors using factor analysis.

In 1967, Norman returned to the foundations of lexical research. Since the presentation of his 16 personality factors, Cattell's work was widely scrutinized because to his reduction techniques (Goldberg, 1982). To deal with these flaws, Norman decided to go back and begin with the entire set of 18,000 words used by Allport. In addition, Norman decided to compile his own exhaustive list of trait terms from Webster's Third Unabridged Dictionary, which he then sorted into categories. In total, Norman's list contained 27,000 terms. After removing all terms that were duplicated in Allport's list, the list was reduced to 18,125 terms (Goldberg, 1982).

As Allport had done in the past, Norman now had to separate the terms in his list. He took out any terms that were obscure, unclear, or evaluative. Next he separated the list of 7,300 remaining terms into states, traits, and social roles. This left a total of 2,792 trait terms. After administering the terms to college students, Norman was able to reduce the set even further and divide the terms into 75 categories of terms with similar meanings (Goldberg, 1990). The resulting factor analysis of these terms led to five factors.

Goldberg (1981) examined the lexical hypothesis in further detail. He noted that even outside of the United States (U.S.), there were certain terms that made distinctions between individual characteristics. These terms also had an English equivalent within the U.S. Goldberg revisited the work pioneered by Cattell and Norman, repeated the factor analysis, and found what he designated as the “The Big Five,” which referred to the same five main facets of personality that had been found by Norman (Goldberg, 1981). Goldberg (1981) found that no matter how he rotated or analyzed the data, every analysis resulted in finding five personality factors.

Since the time of Goldberg’s research (1981), it has been widely accepted in the psychological community that personality can most broadly be explained by five factors. Overall, the FFM is considered to be one of the best ways to explain human personality (Digman, 1990). The five factors are Openness, Conscientiousness, Extraversion, Agreeableness, and Neuroticism (OCEAN). Openness (also referred to as openness to experience, or intellect) and describe someone who has a wide variety of interests and is curious, intellectual, and sometimes even artistic. Conscientiousness refers to an individual who is dependable, responsible, and achievement oriented. Extraversion describes outgoing and talkative people who have a lot of energy and may be assertive at times. Agreeableness is ascribed to people are caring, generous and trusting individuals. Neuroticism refers to people who tend to suffer from negative emotions, worrying, and having low self esteem.

Personality and Criminal Behavior

The first person to explore the utility of personality traits in explaining criminal behavior was Eysenck (1964). Eysenck asked the very important question: “Why do

most people lead relatively blameless lives, rather than indulging in a career of crime?" (p. 102). He suggested that within everyone is a conscience, or "inner guiding light" that keeps one from committing crime. The person who does not develop conditioned moral and social responses (or a conscience, which is a result of low ability to be conditioned and extraversion) will be more likely to engage in criminal or deviant activities (Eysenck, 1964). Conscience is related to functions of the autonomic nervous system, which is made up of glands and involuntary muscles (i.e., blinking). The body can be conditioned to exhibit certain autonomic responses to external stimuli, as well as internal cognitive processes such as anxiety and fear.

Once an individual has been conditioned to know that certain unacceptable behaviors will be punished, predictable and involuntary physiological reactions will take place. That is why a deterrence explanation of criminal behavior is inaccurate, according to Eysenck (1964). Crime is not always detected, nor does it always merit punishment. Therefore, the deterrents that keep individuals from committing crime must be the autonomic reactions. This fear/anxiety reaction actually takes place even before a crime is committed. At the time a criminal act is contemplated, there is an immediate and unpleasant reaction in an individual who has a conditioned conscience. The closer one gets to actually committing the act, the greater the unpleasant reaction becomes. This process will deter crime long before the judicial system or any other social institution ever becomes aware of the action.

Eysenck saw biology as the primary basis for personality traits. The main tenet of his theory is that an optimal level of cortical arousal (stimulation of the cortex within the brain) is within each person. Behavior or physical performance tends to deteriorate

when arousal is increased or decreased beyond this optimal level (Eysenck, 1964). After a factor analysis of his own, he developed two categories of personality classification. His two categories were extraversion/introversion and neuroticism/stability. Extraverts were people who were poorly conditioned, but who were also outgoing and talkative due to their need for external stimulation to keep their arousal levels optimal and their performance maximized. On the other hand, introverts were quiet and reserved due to excessive arousal. A quiet environment would bring the introvert back to a level of optimal performance. Neurotic individuals were unable to control their emotions and were easily upset. This person was more likely to experience anxiety and depression. The opposite was the stable person who was able to maintain calm in stressful situations.

After more research, Eysenck's work was expanded to include a third category of personality that he termed psychoticism/socialization (Eysenck & Eysenck, 1985). Psychoticism referred to individuals with higher levels of testosterone in the body who were seen not only as people who were emotionally unstable, but as people who were more likely to become violent or aggressive. Characteristic behavior of the psychotic individual included aggression, impulsiveness, non-conformity, and hostility.

To support his theory, Eysenck (1964) provided research showing that extraverted people were harder to condition than introverted individuals. Psychopaths also had a tendency to be harder to condition. In addition to that, he also presented research supporting the assertion that people who commit crimes are more introverted than non-criminal individuals, and those generally scoring higher on psychoticism,

extraversion and neuroticism (PEN) were more likely to engage in criminal activities (Eysenck, 1964).

This relationship is better explained by looking at the link between the biological basis for Eysenck's (1964) theory and each of the traits. Hormones associated with the nervous system are responsible for the level of arousal in individuals. An absence of these hormones or lack of arousal can lead to the creation of extreme extraverts. Due to this perpetual state, that individual seeks excitement and lacks restraint. A criminal who is labeled neurotic would be moody and exhibit very emotional behavior. A psychotic criminal would be someone who is impulsive, acts without thinking, and may also lack the ability to empathize with others (Monte & Sollod, 2003). This pattern held true for myriad behaviors such as traffic violations, sexual promiscuity, recidivism in prisoners and general delinquency (Eysenck, 1964).

It is often pointed out that Eysenck's PEN model is very different from the Five Factor Model. Eysenck only has three factors and one of those factors does not correspond with the FFM at all. Even though Eysenck's (1964) three factors were published almost 20 years prior to the widespread acceptance of the FFM, there is actually an overlap between Eysenck's factors and the FFM. The factors of extraversion and neuroticism are the same. Eysenck (1992) argued that psychoticism actually encompasses certain aspects of both agreeableness and conscientiousness in the FFM.

Review of Relevant Literature

Though there are not a vast number of empirical assessments of personality and crime, the results of existing studies are varied. To assist with processing the various results, the discussion of prior literature will be divided based on the five factors. Though the FFM may be the most widely accepted model of personality in the psychological community, it is still not very well studied in criminal justice. In determining the relationship between personality and criminal behavior, there are few empirical studies that utilize this typology of personality. This section will examine the limited literature on the FFM and crime.

Personality

Since the results of the literature on personality and crime are so varied, each factor in each model will be discussed separately to expose any themes in the literature. The first factors to be discussed will be openness, conscientiousness, and agreeableness. Extraversion and neuroticism will be examined later due to the larger number of studies that cover each of these factors – not only are FFM studies included, but studies of PEN as well. Since some of the studies cover various factors, each study will be discussed in detail the first time it is mentioned in the review.

There are some studies that have not been included in this review. Any studies that examined the relationship between personality and antisocial behavior, psychopathology, or any other abnormal behaviors have been excluded. These studies have been excluded because the FFM is not intended to distinguish between diagnosed mental health illnesses. The FFM is a broad measure of normal personality traits among individuals (Costa & McCrae, 1995).

Openness

In 1994, John, Caspi, Robins, Moffitt, and Stouthamer-Loeber examined the relationship between juvenile delinquency and the FFM using juveniles from the Pittsburgh Youth Study. Three-hundred fifty boys from the study between the ages of 12-13 were assessed on personality using the California Child Q-Set (CCQ). The CCQ was actually completed by the mothers of the boys, who, with the help of a trained examiner, used a set of descriptors to describe the personalities of their children. The boys also completed two questionnaires regarding involvement in delinquent activities as well as substance use. The results of the analysis revealed that delinquent boys were more likely to have lower scores on openness than non-delinquent boys. This means that delinquent boys are less likely to be open to experiences than non-delinquent boys, a finding that seems counter-intuitive.

Perhaps one of the causes of these findings can be accounted for by the flaws in the study. First, the researchers only examined males and completely ignored the impact of personality on female delinquency. Another flaw that might have seriously affected the findings of the study was the method of personality assessment. Rather than have the boys fill out an assessment of their own personalities, their mothers reported on the child's personality traits. It is entirely possible that the answers given by the mothers differed drastically from what the boys would have reported had they taken the assessment themselves. Third, the alpha reliabilities of the scales varied and could be considered quite low (O=.53, C=.78, E=.73, A=.83, N=.71). The internal consistency of the items in the scale show that it is possible that not all questions measured the same construct, which would lead to flawed, if not unreliable findings. Finally, the

results only reported on the differences between the most delinquent boys and non-delinquent boys. There was no attempt to address the behavior of boys who fell in between those two ends of the spectrum, nor was there any report of differences in boys based on range or types of delinquent acts. Reporting results in this way could have left out critical information, and possibly would have excluded the majority of boys in the study.

In a subsequent study, Heaven (1996) tested the FFM in relation to the crimes of interpersonal violence and vandalism/theft. The researchers examined a juvenile population and the sample consisted of 216 high school students in a Catholic school in Wales in the United Kingdom between the ages of 16 and 19 (median = 17). Participants were administered an Australian self report delinquency measure as well as the Neuroticism, Extraversion, Openness personality inventory (NEO-PI). When evaluating participation in delinquent activities, males scored significantly higher than females on the delinquency scale and were also more likely to engage in both interpersonal violence and vandalism/theft. However, on personality, females were shown to score significantly higher than males on all five factors. Despite these differences between the sexes, there were no significant relationships between openness and delinquency for either sex.

There are a few potential problems with relying on this study to inform the current research. The sample population was comprised of foreign individuals, which may have an impact on delinquency reported. Heaven (1996) did not go into detail to explain this possible limitation. The personality assessment utilized, the NEO-PI, has been revised and could possibly offer different results if given currently. In addition, Heaven does not

disclose when the data were collected; however, the date of publication shows the article is at least 14 years old. Finally, the statistical analysis conducted in this study consisted of means, standard deviations, and correlations. Failure to use higher order statistics resulted in a failure to control other variables that may have impacted the findings about delinquency and, therefore, explain the proposed relationships reported in the findings.

The relationship between personality and recidivism was studied by Clower and Bothwell (2001) using an adult population. A sample of 51 inmates in adult education classes in a Louisiana prison participated in the study. The NEO-Five Factor Inventory (NEO-FFI) was administered to measure the five personality factors. Official data on re-arrests was also gathered. Multiple regression analysis showed that only two factors were related to the number of arrests, one of which was openness. This finding would suggest that an individual who is less open is also more likely to be arrested. As mentioned earlier, John et al. (1994) also posited this same finding. Clower and Bothwell (2001) attempted to explain this finding in more detail. Since openness has at times been referred to as culture or intellect by other researchers, perhaps the reason for a lower arrest rate is because people with higher openness scores also tend to be more cultured or refined. It would make sense that this group would be less likely to be arrested. There was no significant reduction in the predictability of openness when neuroticism, extraversion, and agreeableness were excluded from the model. Of particular importance is that the authors also found a statistically significant interaction between conscientiousness and openness that was associated with a substantial increase in the number of arrests. When individuals were both less open and less

conscientious, they were less likely to be arrested than when considering openness alone.

Before accepting these findings, one must acknowledge that some serious flaws exist with this research, most having to do with the sample chosen. The sample was male only and comprised of incarcerated offenders. Such a sample does not allow any conclusions to be made about the impact of openness on the delinquency of women or non-incarcerated individuals. In addition, it is possible that the state of being incarcerated may alter the personality traits of an individual, and therefore is not the most suitable group for study. Another problem was the small sample for study (N=51) that did not allow for generalizations and was not likely representative of any group. Aside from the sample, the assessment chosen, the NEO-FFI, is a short version of the NEO-PI. As mentioned previously, the NEO-PI has been revised and updated so the validity of the results gathered using a short form of the inventory are in question as well.

Laak et al. (2003) attempted to find a relationship between personality and delinquency using only one gender for the sample. The sample population consisted of incarcerated girls in the Netherlands (N=33). Using the Five Factor Personality Inventory (FFPI), it was found that girls with higher scores on openness reported more delinquency than girls with lower scores on the same scale. In determining the relationship between the five factors and specific types of crime, openness was positively correlated with fighting and cheating, in contradiction to results previously reported. Girls who were more open were also more likely to fight and cheat.

This study was subject to many of the same limitations already discussed about previous literature: the sample was small, incarcerated, non-American, and the reporting included only correlations for analysis. However, despite many of the same limitations, the results were very different. One factor that may account for this difference was the examination of a female sample. Another possible reason may be the types of delinquency reported. While many studies may not go into depth on each delinquency measure, Laak et al. (2003) explained a key difference in the operationalization of delinquency for this study. The delinquency scale did not include alcohol or soft drugs because these acts are not addressed by Dutch law and are not considered delinquent in that society. This may differ greatly from the way delinquency is measured in other studies.

Hines and Saudino (2008) studied the way personality factors contribute to both the use and receipt of psychological, physical, and sexually intimate partner aggression. A self report of behaviors was conducted among 480 college students in the northeastern U.S. The personality assessment employed for this study was the Eysenck Personality Inventory (EPI) measuring extraversion and neuroticism. Items from Goldberg's International Personality Item Pool (IPIP) were used to measure conscientiousness, openness, and agreeableness. Negative binomial regression analysis was conducted since the data included infrequently occurring events. In examining the use of aggression among the sample population, openness was only significant in explaining aggression among men. Men who had higher scores on openness were more likely to use physical aggression.

While this study appeared to address the limitations of previous research, the assessment instrument used in the analysis is questionable. The EPI was used to measure extraversion and neuroticism, but is an assessment created in 1975. Since that time, much has changed. The EPI measures each factor by asking if the participant agrees or disagrees with statements given. In contrast, the IPIP is used to measure the remaining factors of agreeableness, openness, and conscientiousness. This instrument consists of a ten-item scale for each factor, measured by a five point Likert scale. The reason for choosing the different scales is unclear. While the EPI only measures two of the relevant factors, the IPIP does measure all five factors and could have been used for the entire survey. The use of these two instruments with two different types of responses may have an adverse impact on the results, but that impact is unknown.

Conscientiousness

Mak et al. (2003) examined the relationship between personality and delinquency among 420 Australian high school students in 9th and 10th grades. Personality was measured using a revised version of Eysenck's PEN scales. Delinquency was measured using an Australian self reported delinquency scale. Results of the study revealed that low scores on conscientiousness were significantly related to delinquency for males and females. Among both sexes, individuals who were less conscientiousness were more likely to commit delinquent acts.

Again, this is another study with methodological flaws in the survey instrument. While the PEN scale was used, this scale only measured extraversion and neuroticism from the FFM. Each scale required a dichotomous yes/no response. Agreeableness

and conscientiousness were measured using a trait adjective list. This list was created in the tradition of the lexical hypothesis and consisted of adjectives that described each factor. Responses are recorded on a five point Likert scale. Openness was not measured.

Mak et al. (2003) did not offer an explanation as to why established measures for agreeableness and conscientiousness were not utilized. Not only were the response categories not similar for all factors, but the length of the scale for each factor varied as well (A=28 items, C=12 items). Reported alpha reliabilities for each factor were not very high, though agreeableness was the one factor with an alpha coefficient of .91 (C=.76, E=.78, N=.77). It is possible the scale for agreeableness, which consists of more than twice the number of items as conscientiousness, contributed to this increased alpha level. However, one cannot be sure of this assertion since the number of items were not reported for the other scales in the study.

In 2005, Hornsveld and de Kruyk sought to explain personality differences of Dutch sexually violent and non-sexually violent forensic psychiatric outpatients. The sample was comprised of 105 sexually violent male patients (mean age = 40.5) and 69 non-sexually violent male patients (mean age = 23.4). Of this original sample, only 61 of the sexually violent group and 68 of the non-sexually violent group actually participated. However, those who participated did not differ greatly on personality scores from those who did not participate. Several scales were used to tap into the relationship of the big 5 personality traits and the different types of criminals in the sample. The scores on the Neuroticism Extraversion Openness-Five Factor Inventory (NEO-FFI) to measure personality were compared to a norm group of men ages 16-80

from the general community. The results of the study showed that all the patients in both groups had lower scores on conscientiousness than the norm group. To simplify, all violent offenders in the sample tended to be less conscientious than a group of “normal” individuals (an average citizen).

It is difficult to generalize the results of this study to any other group since all participants in the group were violent offenders. Offenders may not be representative of the general population, and findings for violent offenders may not apply to individuals who commit other types of crimes. Included offenders also differed because they were all in a treatment program at the time of data collection. As reported, the group was comprised of foreign male participants, which may not generalize to American society.

In a particularly unique study, Blickle, Schlegel, Fassbender and Klein (2006) examined white collar criminals and corporate managers to determine if personality factors were correlated with white collar crimes in Germany. The only factor examined from the FFM was conscientiousness. The conscientiousness scores for the criminal group that committed white collar crimes were higher than that of the group of corporate managers. This finding would directly contradict that of Mak et al. (2003) by suggesting that more conscientious (responsible and achievement oriented) individuals are more likely to commit white collar crime than are corporate managers.

Blickle et al. (2006) suggested that one reason for this finding could be the difference in the German versus the American definition of white collar crime. This study did not refer to the selfish types of white collar crime for personal gain, but instead referred to a type of crime that is perpetrated based on what one feels is in the best interests of the company. Mickle et al. contended that individuals in white collar

positions are by nature persistent and goal oriented; high conscientiousness levels make sense for a competitive business person. However, one possible way to explain the difference between managers and white collar criminals presented by the authors is that these highly conscientious individuals also need a high level of technical ability in order to complete a criminal act in this environment. Since only correlations are reported, it is difficult to attribute any differences to rival causal factors.

Several of the studies that examined openness, also addressed the relationship between conscientiousness and deviance. In a study of juveniles from the Pittsburgh Youth Study, John et al. (1994) discovered that delinquent boys were more likely to have low scores on conscientiousness. Low conscientiousness scores were also shown to be significantly related to vandalism/theft for males and females (Heaven, 1996) and the number of times an individual is arrested (Clower & Bothwell, 2001). Laak et al. (2003) found that incarcerated girls were more likely to cause damage, fight, or cheat if they had lower conscientiousness scores. Hornsveld and de Kruyk (2005) further supported these findings with their study by revealing that violent outpatients tended to have lower conscientiousness scores than the norm group.

Despite these findings, there were also several findings that directly contradicted the idea that low conscientiousness scores lead to delinquent behavior. In 2003 Laak et al. had contradictory findings of their own, and reported that girls with higher conscientiousness scores generally reported more overall delinquency than girls with lower scores. Hines and Saudino (2008) supported this finding a few years later by showing that women who used sexual aggression against others also tended to have

higher conscientiousness scores. This indicates that there is a wide variety of interpretations of the impact of conscientiousness on deviance.

Agreeableness

All of the studies examining the relationship between agreeableness and deviance have also reported effects among openness and/or conscientiousness. Since the studies have already been discussed in detail elsewhere, a brief discussion of the results is warranted here. The majority of studies reported that lower scores on agreeableness are associated with increases in deviant behavior. Individuals who are less agreeable are more likely to commit deviant acts. John et al. (1994) examined boys from the Pittsburgh Youth Study, and a one-way ANOVA revealed that delinquent boys were significantly more likely to have lower scores on agreeableness than non-delinquent boys. Heaven (1996) found that among high school students in Australia agreeableness was significantly related to interpersonal violence for males and females and vandalism/theft among males. Mak et al. (2003) also examined Australian high school students. The results of the study showed that low scores on agreeableness were significantly related to delinquency for both males and females.

Older populations of predominantly adults were also used to explore the relationship between agreeableness and delinquency. In studying violent psychiatric outpatients, Hornsveld and de Kruyk (2005) found that the group of outpatients scored lower on agreeableness than the norm comparison group. Hines and Saudino (2008) studied the use of aggression among male and female college students. Women who scored lower on the agreeableness scale were more likely to use both psychological and physical aggression against a partner. There was no significant effect for men.

Not all studies had these same results. While Hornsveld and de Kruyk (2005) found that violent outpatients had lower agreeableness scores when comparing two separate groups of violent outpatients, there was a difference. Sexually violent outpatients scored higher on agreeableness scales than non-sexually violent outpatients. Laak et al. (2003) found no relationship between agreeableness and delinquency, while Clower and Bothwell (2001) found no relationship between agreeableness and recidivism.

Extraversion

For ease of comparison among the articles presented here, the studies reviewed will begin with adult incarcerated offenders. The focus will then shift to juvenile incarcerated offenders. Finally, the literature will focus on studies of extraversion with student populations.

In 1962, prior to the publication of Eysenck's (1964) book, Fitch sought to examine extraversion and determine the relationship between extraversion and criminal behavior. His study consisted of 279 adult male participants at Bristol prison in the United Kingdom. The Maudsley Personality Inventory (MPI) was used to measure extraversion. Scores for extraversion were tested using chi square. The sample was broken into two groups - one group of sex offenders (n=89, mean age 31.43), and one group of property offenders (n=89, mean age 31.59). Extraversion was shown to have a significant impact on offending with a higher mean for property offenders. Recidivists were also examined, but did not show significant extraversion scores.

Though the findings for this study show that offenders are more likely to be extraverted than recidivists, the results can come under scrutiny. No higher order

statistics were used in evaluating the data collected making it impossible to control other possible rival causal factors. In addition, no information is given about the makeup of the recidivist group; therefore, there is no evidence that this group is comparable to the two groups of offenders. If the groups were vastly different, this may have had an adverse effect on the findings.

Not long after the publication of his cutting edge PEN theory, Eysenck sought to test his theory and note differences in personality factors between several different groups (Eysenck, 1970). First, Eysenck gathered a criminal group that consisted of 603 male British prisoners from 4 separate prisons with a mean age of 22.1. In addition to the prisoners, there were also three other comparison groups. One group consisted of 532 male non-prisoners with a mean age of 44.6. The second group was made up of 423 university students with a mean age similar to the criminal group. The last group was comprised of 185 industrial apprentices with a mean age of 17.1.

Only correlations were reported in this study results showed apprentices had the highest scores on extraversion. Prisoners had higher scores on extraversion than both married men from the male non-prisoner group and the university students, but lower scores than apprentices. One of the concerns with this study is that for the extraversion scale, the reliability coefficient, when used with prisoners, is much lower than the reliability of the control groups, which make comparing the two groups more difficult. The groups used for comparison were also not necessarily comparable groups. The mean age of each group varied widely and the methods or rationale for choosing the groups was not discussed. It is also not clear why the author separately reported the results of married men when that was not an original comparison group.

Soon thereafter, Eysenck and Eysenck (1971) conducted another study that was again meant to measure the relationship between PEN and crime, and again used several groups for comparison. The sample for the study consisted of 606 randomly selected incarcerated male criminals with a mean age of 26.53. The comparison group consisted of 518 white railroad employees with a mean age of 25.85.

The results of the study showed prisoners to be significantly lower on extraversion, which is a direct contradiction of Eysenck's (1964) theory. However, there is a lingering question about the makeup of the groups that may have affected the study. There may have been differences between white and minority railroad workers. In the initial sample of rail men, there were also 140 "colored" rail men. They were all removed from the sample because they were shown to have significantly different scores on some of the scales. Despite this, people of color were not removed from the prison sample because there was no way to identify the race of participants. The researcher does not report what those differences in scores were or propose any rationale for why different races would have significantly different scores on the same scales. In addition, the prisoners were not separated on the same variable, which may affect the findings in the datasets.

Burgess (1972) attempted to test the relationship between personality and crime with an adult sample in Canada. This study can actually be divided into three separate studies. All three studies employed the use of chi square to analyze the data. In the first study, the sample consisted of 29 Canadian prisoners (15 labeled psychopaths and 14 non-psychopaths) and a comparison group of 16 non-offenders made up of students and hospital workers. Both groups were given the PEN inventory. Participants were

separated based on their scale scores and it was found that the criminals were over-represented on extraversion. However, it is not clear how this separation, based on scale scores, was made or what the cutoff was for inclusion in each group. In addition, the authors did not address the possible impact of the differing sizes of the groups. It is possible that the groups, which were not equal in size, effected the results. However, size was not controlled for, so it is impossible to know what, if any, impact this may have had.

In his second study, there were three groups of subjects: one group of prisoners who were short term recidivists, one group of prisoners with behavior disorders, and a comparison group of railroad employees. The group of inmates with behavior disorders was significantly less extraverted than the railroad employees. The recidivist prisoners were slightly more extraverted than the railroad employees, but not significantly. It is unclear why the two groups of offenders would differ so greatly on extraversion. This finding is in contradiction with Eysenck's theory since one inmate group was actually less extraverted than the proposed "normal" comparison group. It is possible that the disorders have some impact on extraversion. However, this was not examined more closely or controlled for in the study.

In the third and final study, the Eysenck Personality Inventory (EPI) was used to measure personality to check for any biases due to use of the PEN inventory. Two groups of subjects were used: one with 62 prisoners serving a sentence of a year or more, and a comparison group of 74 non-offenders (half students and half skilled workers). The findings were similar to the first two studies since prisoners were found to be more extraverted than the normal group.

In 1977 Eysenck and Eysenck continued to study different comparison groups and used the Eysenck Personality Inventory (EPI) to determine if there were personality differences between prisoners and non-prisoners. The sample included what were described as two “reasonably random” groups. One consisted of 2,070 male prisoners, and the comparison group contained 2,442 citizens. The age range for both groups was between 16 and 69 years old. Results indicated that extraversion among prisoners was only significant among the 40-59 year old range. For both groups, extraversion generally decreased with age.

It is of some concern that Eysenck did not specify what constituted a “reasonably random” sample. The method of data collection can greatly influence the reliability of the study, but in this study the methods of creating the two groups were not clear at all. It is true that not all of the previous sample populations have been random samples (Eysenck, 1970; Eysenck & Eysenck, 1974; Fitch, 1962). The sampling strategy employed here can neither be referred to as random, nor convenience.

In the same year, Eysenck, Rust, and Eysenck (1977) tried to find a way to classify criminal behavior based on personality. They attempted to determine if certain personality types were associated with specific types of criminal activities. Five groups of criminals were used for the study: (a) violent offenders with two or more convictions for violence (no sex crimes), (b) property offenders with three or more convictions for breaking and entering (other convictions of theft only), (c) confidence crime offenders who had three or more convictions for fraud (no violence or sex offenses, no more than two breaking and entering, none for robbery), (d) inadequate offenders who had ten or more convictions in three years and an average sentence of less than 18 months (no

robbery convictions and no more than one violent or sex offense), and (e) residual offenders who did not fit the other categories but committed a variety of crimes. All of the 156 participants were between 18 and 38 years old.

The Eysenck Personality Questionnaire (EPQ) was administered to measure PEN. The extraversion scale asked about both sociability and impulsiveness. Results indicated that those convicted of confidence crimes, as well as violent and residual offenders, scored high on extraversion. Inadequate offenders and property offenders had low scores on extraversion.

Research was also conducted using an American sample to test the PEN theory (Bartol & Holanchock, 1979). This particular study contributed uniquely to the literature because Eysenck's studies were typically conducted using mostly white participants or race was not included as a variable. This study included black and Hispanic American prisoners who were assessed using the EPQ. The sample was comprised of 398 male inmates at a correctional facility in New York: 248 blacks, 121 Hispanics, 27 whites, one Indian, and one mixed race individual. The sample was also divided into groups based on offenses committed – homicide (n=59), aggravated assault and attempted murder (n=67), rape (n=23), robbery (n=173), burglary (n=51) and drugs (n=25). A comparison group was created using 187 men waiting in unemployment agencies in New York City.

According to the results, the differing ethnic groups did not have significant differences on EPQ scores. Among the different offense categories, sex offenders were significantly more introverted with lower scores on extraversion than other types of offenders, and correlations between incarceration time and EPQ scores were not significant. The criminal groups did score significantly lower on the extraversion scale

than the comparison group, which is a direct contradiction of Eysenck's (1964) theory. Of particular concern with this study is that the criminal histories for the comparison group were not obtained; therefore, making it hard to compare the criminality of the two groups. It is highly possible that members of the comparison group also had criminal histories that would have aligned them more with the groups of prisoners. Offenders who scored higher on a lie scale (to seek out answers given for social desirability) were omitted from the analysis. Despite this omission, scores for the extraversion scale were still similar to the results previously obtained. However, these results should be reviewed with caution as the effect of comparing uneven numbers of 187 men to 398 offenders was not assessed in the study.

Alexio and Norris (2000) examined personality and self reported offending as a test of Eysenck's theory. The sample was comprised of 101 British male offenders with a mean age of 19.14 years old. All participants were convicted of crimes and serving sentences less than 4 years at an offender's institution. Each participant completed a background questionnaire, the EPQ revised, and the self reported delinquency scale. Correlations showed that extraversion had a significant positive correlation with crimes against people.

Both juvenile and adult populations were examined in the literature. Little (1963) examined the personality traits of incarcerated populations and used Maudsley Personality Inventory (MPI) scores for 290 borstal inmates. The inmates ranged in age from 16-21 and all had lower class backgrounds. The inmates were from three separate institutions in England and the data were gathered over a period of 2 years. One institution was sampled twice for a total of four groups. As a comparison group,

the study made use of a non-delinquent population studied by Eysenck a few years earlier. The results were very straightforward and showed no significant differences on extraversion.

Price (1968) gave the MPI to girls at a borstal school between September 1965 and January 1966. The mean age was 19.3 and the sample was comprised of 110 girls who had several prior convictions. Most of the girls had received some form of treatment. The survey was given in three separate groups. In group A, girls took the survey to their rooms, though they still had access to each other and test administrators. In group B girls were tested in their classrooms, and in group C tests were given in groups of four.

The data indicated the means for the girls on extraversion; however, no other statistics were indicated. This study also continued the trend in the use of comparison groups to test relationships between personality and crime. As a comparison group, the study uses samples from other previous studies ("normals," recidivist prisoners, hospital patients, and female prisoners). Based on this comparison, it was shown that the girls had significantly higher scores on extraversion than normal individuals and recidivists. When compared to delinquent boys of similar ages, the girls were found to score significantly higher on extraversion. When compared to female prisoners and hospitalized psychopaths, the girls were found to have similar extraversion scores.

The girls were shown to be more extraverted than normal individuals, which would support Eysenck's (1964) theory. However, the girls were also shown to be more extraverted than both recidivists and delinquent boys. This could be an important finding since most of the previous research had been conducted using male

populations. Overall, the girls were found to be similar in extraversion to both prisoners and psychopaths. One problem with these findings is in the makeup of the comparison groups. Aside from incarcerated boys, none of the other groups were compared to girls. We do not know the age range of the other groups, nor can we ascertain when the other groups were evaluated. It is possible that the age of the data as well as other possible factors within the groups had an adverse effect on the results.

In 1974 Eysenck and Eysenck studied institutionalized juveniles. This study examined the relationship between personality and recidivism rates using 178 boys in a borstal institution. Rather than comparing criminal and non-criminal groups in this study, the goal was to compare first time criminals to recidivists. The rationale for this study was that the researchers felt that recidivists could be considered to be more severely criminal due to repeat offending. The Personality Inventory (PI) was given to measure extraversion. After 3 years and 9 months of gathering data on offenders, the recidivism records (which referred to offenders who were apprehended and sentenced) for all the boys were analyzed. Of the original group of 178 participants, 122 boys were recidivists and 56 were not. Recidivists were found to have significantly higher scores on extraversion than would be expected in a normal population.

Student populations were also administered personality assessments to determine the relationship between personality factors and deviance. While testing the PEN theory, Rushton and Chrisjohn (1981) conducted a study with seven different sample groups. Sample 1 consisted of seventeen 16 year old high school boys in Britain. They were given the High School Personality Questionnaire, the Eysenck Personality Inventory (EPI) and a self reported delinquency scale in the spring of 1974.

Sample 2 was comprised of 124 male and female undergrads in a Toronto psychology class. They took the EPI and the delinquency scale in October 1976. Sample 3 contained 31 male and female undergraduates with a mean age of 31 in a Toronto psychology class. They completed the EPI, the 16 Personality Factor Inventory and the delinquency scale in July 1977. Sample 4 included 42 male and female second year students in a psychology class at a university in Ontario. They completed the EPI and delinquency scale in November 1977. Sample 5 was surveyed in November 1977 and was made up of 31 undergraduates with almost the same makeup as sample 4. Sample 6 contained 25 male and female students similar to groups 4 and 5 in November 1977. Finally, sample 7 contained 41 male and female undergraduate students similar to groups 4-6, but were surveyed in November 1978.

The results showed that self reported delinquency was significantly related to extraversion in five of the six samples (extraversion was not measured in sample 1). No explanation was given by the author as to why this variable was left out of the first group. This was not the only limitation of this study. The data are very old at this point and range between 1974 –1978. It is unknown what effect this may have on the results. It is difficult to compare the results across groups due to the variation in the composition of the groups. However, one may argue that this only serves to further support the idea that extraversion is positively correlated with deviance across countries and groups.

The majority of research on extraversion and delinquent behavior previously discussed in other sections of this literature review indicates a positive correlation between the two variables. In 1994, John et al. found that delinquent boys in Pittsburgh had higher scores on extraversion than non-delinquent boys, which makes sense in

light of the fact that Mak et al. (2003) found that high extraversion scores were a significant predictor of male delinquency. When comparing incarcerated populations to normal groups, prisoners are found to have higher extraversion scores and therefore are more outgoing, talkative and assertive (Burgess, 1972; Eysenck, 1970; Price, 1968).

High extraversion scores have also been correlated with several different types of criminal behavior. Fitch (1962) found that property offenders had higher extraversion scores, while Eysenck et al. (1977) found that offenders with increased extraversion were more likely to commit confidence crimes and violent crimes. Alexio and Norris (2000) reported a similar relationship where individuals with high extraversion scores were also more likely to commit crimes against persons. Laak et al. (2003) showed that higher extraversion scores were positively correlated with status offenses and Hines and Saudino (2008) found increased extraversion scores among women who used sexual aggression against intimate partners.

A few studies had contradictory findings and some pointed out that low extraversion scores were also related to delinquency. Eysenck (1971) and Bartol and Holanchock (1979) both reported that prisoners in general tended to have lower extraversion scores than normal groups. Eysenck et al. (1977) found that lower scores on extraversion were associated with property crimes, and Bartol and Holanchock (1979) had the same result for sex offenders. Finally, a few studies also reported no significant relationship between extraversion and criminal behavior (Clower & Bothwell, 2001; Eysenck & Eysenck, 1977; Heaven, 1996; Little 1963).

Neuroticism

Numerous studies have presented information to support the assertion that criminals have higher overall scores on neuroticism scales than either normal groups or non-convicted individuals (Burgess, 1972; Eysenck, 1970; Eysenck & Eysenck, 1971; Eysenck & Eysenck, 1977; Laak et al., 2003; Little, 1963; Price, 1968). Criminals have been shown to be more neurotic than the average person and those who have not been convicted by the criminal justice system.

Neuroticism scores have also been shown to distinguish between different types of crimes. High scores on a neuroticism scale have been associated with increased incidents of rape, drugs and burglary (Bartol & Holanchock, 1979), causing damage (Laak et al., 2003), and the use of both psychological and physical aggression among men and women (Hines & Saudino, 2008). Hornsveld and de Kruyk (2005) reported that sexually violent psychiatric outpatients had higher neuroticism scores than non-sexually violent outpatients. To state that finding more simply, higher neuroticism is associated with a higher likelihood of violent sexual crimes than all other sexual crimes among outpatients. Heaven (1996) discovered that high neuroticism scores were also positively correlated with interpersonal violence among women and vandalism/theft among male offenders.

Despite the findings of positive associations between neuroticism and deviance, there have also been studies that have reported contradictory findings. Only one of the studies in this literature review reported a negative relationship between neuroticism and deviance. Eysenck et al. (1977) attempted to distinguish between different types of offenders using personality factors. The analysis showed that violent offenders,

property offenders, and those convicted of confidence crimes had lower neuroticism scores than other types of offenders. Further, a few of the studies failed to show any significant relationship between neuroticism and deviance at all. John et al. (1994) were not able to show a significant relationship with delinquency among juveniles in Pittsburgh, nor were Mak et al. (2003) able to show a relationship with delinquency among Australian juveniles. In addition, there was no significant relationship seen between neuroticism and recidivism (Clower & Bothwell, 2001).

Co-Offending

Before one can fully understand the relationship between personality and offenses committed in groups or with others, a deeper understanding of the concept of co-offending is required. Co-offending is simply defined as offending within groups, or committing delinquent acts more than one offender (Warr, 1996; Weerman, 2003). This definition does not refer to crimes committed by gangs because gangs are only a fraction of all delinquent groups and not all delinquent groups have the structure of a gang (Warr, 1996). Co-offending is not the same as having delinquent friends because it is possible to have many delinquent friends, yet never offend with them. When co-offending is examined in the literature, it is an examination of group violations among individuals who may or may not be part of a gang, and may or may not be friends.

The literature regarding co-offending has been focused on trying to shed some light on this phenomenon. To date, there have not been an extensive number of studies on this subject. Common themes in the literature generally examine the relationship between co-offending and race, age, and sex. Studies presented in this chapter for

review include a mix of data sources, criminal offenses, and variables. However, from this data one will gain a clearer understanding of the complexity of co-offending.

Official statistics are often used by researchers to evaluate criminal behavior. Carrington (2002) gathered UCR 2 Data in Canada between 1992 and 1999. The data was obtained from half of all Canadian provinces and territories, which covered a total of 3.4 million offenders and 2.9 million incidents. The goal of the study was to determine the differences in the amount of crime committed alone and in groups. According to the results, overall 24% of crimes were committed with groups and that rate was higher among youth than adults.

Conway and McCord (2002) utilized arrest records and rap sheets for a random selection of records of offenders under the age of 18 (mean = 14) in Philadelphia in 1987. The sample in this particular study consisted of 235 individuals, most of whom were African American males. The goal of the study was to examine the relationship between co-offending and violence, specifically the effects of committing the first co-offense with violent accomplices. According to the findings, 37.4% of initial (or first time) co-offenses committed by the sample were violent crimes, while 53.6% of first time co-offenses were serious property crimes. When the sample group was compared to a group of subjects who never co-offended (and had therefore been excluded from the study), those individuals who had never co-offended tended to commit less violent crimes and less crime overall. Individuals who were also excluded from the study for committing prior violent solo crimes tended to have similar crime rates as the co-offending group, but actually committed more violent crime overall.

While these results appear to shed much light on the topic of co-offending, there are still a few limitations to this study. The biggest problem was the data used for this sample. Juveniles who were included in the study were assumed to have committed criminal acts based on data gathered from rap sheets and court records. The first issue with this type of data is simply the validity of official data as a measure of involvement in deviant behaviors. It is possible that the individuals included in this study may have committed more crimes that have gone undetected by the criminal justice system. It is also possible that individuals included in this study were innocent of the crimes for which they were accused. This is a particularly salient point because the court records used in this study included juveniles who had been arrested, complaints against the juveniles, as well as crimes reported to police that did not result in an arrest.

Aside from considering data for which involvement in deviance is questionable, the data in this 2002 study is outdated. Individuals targeted for this study allegedly committed offenses in 1987, and then information on additional offenses was gathered for the years 1976-1994. Even 1994 data would be 16 years old at present, but the year for the origination of the research is 23 years old. It is difficult to make generalizations based on the data presented in this study.

Stolzenberg and D'Alessio (2008) utilized a broader database of information to examine co-offending and analyzed 2002 NIBRS data in the U.S. in a two-part study. NIBRS data were obtained for the only seven states where 100% of agencies reported to NIBRS: Delaware, Idaho, Iowa, South Carolina, Tennessee, Virginia, and West Virginia. The data included 46 offenses, of which 8 were Part I offenses.

According to the data, solo offending was the dominant type of offending for all age groups and tended to match the age-crime curve. In other words, solo offending peaked during the teenage years and declined as an individual aged. The peak age for crime in general (both property and violent offenses) was 18 for males and females, as well as Blacks and Whites. Between the ages of 18 and 23 solo offending fell 14%, but co-offending fell 55%, which was almost four times the rate of solo offending. Property crimes among adolescents were most likely of all crimes to involve co-offending.

In the second analysis, Stolzenberg and D'Alessio (2008) wanted to determine if their findings were similar when relying on victim or witness identification of offenders. This information was also obtained from the NIBRS files for reported offenses. The results were similar to what was found using official statistics. Solo offending remained the primary form of crime commission. The inverse relationship between co-offending and age remained stable despite variation in sex or race.

Using the same data for Philadelphia boys from the Conway and McCord (2002) study, McGloin and Piquero (2009) tried to answer a different question about co-offending. Rather than focusing on how violent accomplices effect violent offending, the purpose of this study was to explore the relationship between the number of offenders and violent offenses. Specifically, the authors wanted to determine if juveniles with more accomplices have higher levels of violent offenses. In addition, they sought to determine if individuals who had not committed violent acts in the past were more likely to have a violent first co-offense as the number of accomplices increased. According to the results, violent offenses tended to have more co-offenders than non-violent crimes. As the number of people in an offending group increased, the number of violent co-

offenses also increased. Logistic regression showed that the odds of the first group offense being a violent offense increased 33% for each additional co-offender present. Race was also included in the analysis and the results showed that Hispanic offenders have fewer violent group offenses than African American offenders.

Van Mastrigt and Farrington (2009) examined offenses, cleared by the North England police in London, in an attempt to determine which variables were most strongly related to co-offending behavior. The sample population consisted of 61,646 offenders between the ages of 10 and 74. The crimes measured ranged from minor theft to crimes against persons. Co-offending was measured by analyzing records that indicated whether an offender had re-offended within 36 months. The results were coded using a dichotomous yes/no response. Bivariate associations with age, gender, and crime type showed that age and co-offending had a negative relationship. The mean age for co-offending was 21.9, while the mean age for solo offending was 26.5.

Regarding the gender variable, females were found to be more likely to co-offend than males (24% vs. 21%). In reference to the type of crimes committed, co-offending rates were shown to be higher in relation to property offenses in general (arson, theft, burglary), though robbery was the only crime against persons highly correlated with co-offending. Co-offending was shown to be very rare in the commission of sex offenses and fraud. Logistic regression found that age, gender, and crime type were all independent predictors of co-offending.

One point of concern in this study was the potential problem created by using official data for analysis. The data consisted of offenses that had been cleared by the police. This meant that enough evidence had been gathered to charge an individual

with a crime. However, this did not mean that the person was ever charged or convicted of any crime. There was a distinct possibility that information had been included where no crime had been actually committed, thereby skewing the results.

Andresen and Felson (2010) studied co-offending in British Columbia, Canada using official information from the Royal Canadian Mounted Police Information Retrieval System. The data included in the analysis consisted of what the authors referred to as negative police encounters. This included individuals charged with crimes, individuals who committed chargeable offenses but were not formally charged with the crime, as well as individuals who were suspected of crimes over a 2 year period. A broad range of index offenses were included in the study such as homicide, sexual assault, robbery, assault, burglary and theft of a motor vehicle. The age range of included offenders was 8-68, but offending was highest between the ages of 16 and 19. Acts of co-offending accounted for less than 40% of criminal acts by the early 20s.

When looking at the types of crimes, despite the numerous crimes examined in the data, the only crime for which results were presented was burglary. The rate of co-offending for residential burglary decreased to 50% at 18 years of age. In contrast, co-offending rates for residential and other burglaries (mobile homes and recreational vehicles) did not decrease to 50% until the age of 21.

This study made the same mistake as Van Mastrigt and Farrington (2009) in regards to the types of offenses included in the study. Information included by Andresen and Felson (2010) consisted of offenses with which individuals had been charged, chargeable offenses, and suspected offenses. Chargeable offenses, as discussed earlier, were offenses for which there was evidence, but formal charges were

not brought by the criminal justice system. This study also included suspected offenses, which are crimes for which an individual was suspected of a crime, but for which there was no evidence to charge anyone with an actual crime. This meant that for suspected crimes, no one admitted to the behaviors, nor could they actually be considered an offender. However, the authors did not discuss how many of these types of cases were included in the study. The effect of this data on the findings is unknown.

Official statistics and police data were not the only sources used in reporting about co-offending behavior. Erickson (1971) desired to determine if there were any differences in co-offending results between self reports and official statistics. However, his study did not utilize both methods. The study consisted of only a self report of delinquent activity among 15-17 year old males in Utah. Participants were divided into three groups of 50 participants each – one group each of official non-delinquents, persistent community offenders with official records, and incarcerated offenders. Interviews with participants focused on offenses committed, and whether the offender was alone or with others.

Group violation rates were shown to have the highest correlations with drinking, drugs, destruction of property, arson and theft. The crimes with the lowest rates of co-offending were status offenses, robbery and fighting. Erickson then compared his self report findings with group violation rates that had been reported in earlier literature that had utilized official statistics. He concluded that self reports tended to show lower rates of co-offending than official statistics. Only rates could be compared because only rates and correlations were included in the analysis.

In 1977, Erickson teamed up with Jensen to attempt to explain the underlying properties of co-offending groups. The data for the study was gathered from 1700 high school students in Arizona who completed self report surveys. Group offending rates were highest for drinking and drug offenses, as well as burglary and vandalism. The crimes with the lowest group of violation rates (and the only rates under 50%) were fights and assault. When gender was examined more closely, the only statistically significant crime for which males had higher group violation rates was grand theft. Females had significantly higher violation rates for shoplifting and drinking. Overall, when females do commit crimes, they were found to be just as likely to co-offend as males.

In 1996, Warr attempted to use self report data to shed even more light on the types of individuals who participate in co-offending groups. Warr (1996) used data from the National Surveys of Youth conducted in 1967. This probability sample of 847 youth in the U.S. between the ages of 13-16, consisted of questions about co-offending as well as 12 delinquent offenses. Descriptive statistics reported that the mean for group violation rates was 73%. Group violation rates were the highest for alcohol (mean = 91), drugs (mean = 79), and burglary (mean = 91), but below 50% for truancy and theft. In reference to other characteristics, Warr (1996) pointed out that instigators of co-offending acts tend to be older than others in the group, and are most often male.

One of the most obvious problems with this study is the age of the data used for analysis. While any information on co-offending is welcome and helpful, the data in this study were almost 30 years old at the time this article was published. Data this old may

no longer be relevant. However, since only means, rates, and correlations are reported, it is not possible to gauge the effects of other factors on these results.

One study sought to combine both self report and official statistics in the same study to examine co-offending. Reiss and Farrington (1991) studied a group of males in London to determine how and why co-offenders were selected. The data in the study came from the Cambridge study in Delinquent Development, which was a longitudinal survey of 411 boys. The boys began participation in the study at approximately 8 years of age, and continued for a 24 year period. Ninety-four percent of these boys continuously participated for the entire 24 year span. Data were gathered using both interviews and official reports.

The results of the study showed that half of all offenses committed by the boys were committed alone. Co-offending was shown to decrease with age, while solo offending increased. When co-offending did take place, it was most often in crimes such as burglary, robbery, theft, and theft from a motor vehicle. Violent crimes generally had a below average number of co-offenders. Crimes of fraud and sex offenses were least likely to have co-offenders, which is in agreement with the results of van Mastrigt and Farrington (2009). Drug offenses and receiving stolen goods were also less likely to involve co-offenders.

While this study was mostly sound, it once again brought up the issue of crime measurement as a potential problem in comparing all the studies. The data were quite old, having been collected between 1962 and 1986. Since the data were collected in England, there were variations in how crime was measured. Crimes were only noted if they were recorded in the Criminal Record Office. This most often included the crimes

of theft, burglary, and motor vehicle theft. However, more common deviant behaviors such as traffic offenses, public drunkenness, and simple assault were excluded.

The practice of combining both official and self report data was not limited to Reiss and Farrington (1991). In 1998, Hakkert followed the same process and utilized various data sources to examine the rate and prevalence of co-offending. The data for the study consisted of several reports provided by the Ministry of Justice Research and Documentation Center in the Netherlands. Information from official police data in one region of the country showed that almost 60% of offenses committed in the area were committed by more than one offender. The majority of co-offending occurred with crimes such as breaking and entering, auto theft, burglary, and violence. Co-offending was less frequent with traffic violations and sex offenses.

Data retrieved from one self report survey included 5,051 individuals between 15 and 25 years old in seven Dutch towns. Co-offending correlated the most with vandalism, drugs, and intimidation/aggression, and least often with theft. A separate data set from the Research and Documentation Center included information on co-offending among individuals ages 14 to 21. Co-offending was found to most often occur in drug crimes, riots, graffiti, and motor theft. Co-offending occurred least often with theft and buying and selling stolen goods, which were most often solo offenses. Minors were shown to be more likely to co-offend than adults. This difference was most noticeable in reference to the crimes of bicycle theft and shoplifting. Girls were also found to participate in co-offending more often than boys.

While this research does provide a wealth of information from multiple sources, there is not enough information given about each study to allow for meaningful

comparison across all the results. No information about methods or types of analysis was given. However, any research that sheds more light on this under-studied area of co-offending is valuable.

The Present Study

There are many limitations to the research that has been presented. In reference to the personality and crime articles, several limitations exist. The first problem is that there are many conflicting findings for the five factors that it is difficult to definitively draw any conclusions regarding to the impact of personality factors on criminal behavior. The second problem is that when using the data presented, higher order statistics were not normally presented. With few exceptions, and especially in the older research, the most commonly presented data were the means of the personality factor scale scores. Other statistics included descriptions and correlations as reported results. The biggest problem with this type of data is that it is impossible to attempt to set controls for any rival causal factors that may effect the results of the data analysis. The current research was an attempt to address these problems. In this current study, many common factors, such as age, sex, gender, and race, were controlled. This study utilized typical methods such as difference of means tests and ANOVA, but also included regression to better explain the relationship between personality factors and deviant behavior. Different variables were controlled for to determine the strength of the impact of each factor on deviance.

The third problem is that the samples used for much of the research were comprised of groups of institutionalized individuals or incarcerated offenders. Incarcerated adult and juvenile offenders served as one of the largest sample

populations utilized in the research. Aside from traditional prison inmates, juvenile sample groups have also consisted of those who are placed in borstal training schools. Institutionalized groups are not only made up of incarcerated offenders, but may also consist of other institutionalized samples of interest such as psychiatric patients.

Few of the reviewed articles used a sample that would or could be defined as “normal” in comparison. Most often, offenders and prisoners were examined and normal individuals served as a comparison group. The current study utilized a college student population as the sample group under study. In criminological research, the use of student populations has been used in the exploration of various criminal behaviors and theoretical tests (Payne & Chappell, 2008). This study was an attempt to explain the link between personality and crime with a sample population considered normal members of American society. This allowed for a determination of the amount of variation in personality factors among an average, non-institutionalized group. While acknowledging the limitations of a student sample, the use of such a group can help with the understanding of the relationship between personality and crime by allowing the examination of a “normal” population.

Finally, the researchers on personality and crime did not consistently examine a wide variety of crimes to determine the impact of personality on different deviant acts. When taken as a whole, the research does appear to incorporate various crime types. However, it is also true that very few single researchers attempted to examine a variety of crimes using one sample. The current study was intended to examine not only crime in general, and not only a few crimes, but a wide variety of deviant behaviors. Offending behaviors ranged from status offenses and public disorder offenses to

offenses against persons and property. In this way, not only was it be easy to see the relationship between personality factors and offending as a whole, but the relationship with very specific types of crime and offending behaviors.

The literature on co-offending also had a few limitations. Co-offending research tended to have consistent results, but the research only focused on descriptive characteristics of co-offenders such as age, sex, and race. There was no discussion regarding the underlying causes or contributors to co-offending. While researchers acknowledged that co-offending may have some type of relationship with delinquent peers, researchers did not attempt to study social or psychological variables that may have assisted in explaining co-offending.

The current research was an attempt to address these issues by offering an in-depth analysis of psychological variables and co-offending. Personality factors were studied to determine what effect, if any, personality may have on offending. Results aided in a more in-depth understanding of the importance of individual characteristics in co-offending behaviors, but did not necessarily lead to the creation of a theory of co-offending. However, results will equip researchers with what may be another piece of the puzzle in an under-researched topic area.

The next chapter outlines the research methods and analysis plan for the current research. The research questions central to the study and hypotheses that arise from the literature are cited. The measurement of the personality variables (openness, conscientiousness, extraversion, agreeableness, and neuroticism) as well as the measurement of additional variables such as social desirability, age, and sex are

discussed. The quantitative methods used to test the hypotheses are explained in detail and the analysis plan is explained in detail.

CHAPTER THREE RESEARCH METHODS

The current research, which utilized a quantitative design, examined three main areas. First, the researcher sought to determine the relationship between the FFM of personality and offending. Second, the researcher sought to determine the relationship between personality factors and different types of offending. Third, the researcher examined the relationship between personality and co-offending. These variables were measured in addition to other variables that have been shown to correlate with offending and/or co-offending, such as age, race, and sex.

Research Design

This study was implemented with a non-experimental design. There was only one group for examination and there were no pre-tests. Individuals were not (and could not be) randomly assigned to personality groups (Shadish, Cook, & Campbell, 2002). Personality types also cannot be compared for differences because in terms of personality, each person has characteristics of every trait to differing degrees on a continuum. The study was, in essence, a one-incident survey design that consisted of only a single observation. However, since the study was based on research that shows that personality plays a role in criminal behavior, other factors were statistically controlled to determine if personality was still significant in effecting deviance. The study was cross sectional in nature and data were collected about behavior and events at one point in time only. Data were collected through self-administered questionnaires.

The current study was an exploration of the relationship between personality and deviance and was intended to describe any existing patterns found in the collected data. In addition, results assist in further understanding the impact of personality on criminal

behavior, and lay the foundation for further research. However, it is important to note that the purpose of this study was not to be deterministic in nature. The results are not intended to suggest that any patterns found are the result of psychological differences in persons, or the product of natural predispositions in individuals or groups. It is not suggested that the findings are able to accurately determine exactly who will become criminal. To do so is to forget the large impact of environmental factors on human behavior. However, it is intended to highlight any noticeable patterns as foundations for further question and study.

Research Questions and Hypotheses

Past literature has yielded mixed results on the effect of personality on criminal behavior. In a few areas, there has been some general consensus, but in others, no answers or conclusions may be drawn at all. This study addressed some of the main questions proposed in previous studies, as well as some new questions for consideration that have been alluded to in past results, but not examined in depth. The current study examined the following four primary questions:

RQ1. Do personality factors influence the frequency of involvement in offending?

RQ2. Do personality factors influence the frequency of involvement in co-offending?

RQ3. Can personality factors predict who is more likely to commit offenses alone, with others, a mixture of both, or not at all?

RQ3. Can personality factors predict involvement in particular types of offending?

Hypotheses

The proposed research hypotheses are presented below:

Ha1: There is a significant, positive relationship between openness and criminal behavior.

Laak et al. (2003) found that girls with higher levels of openness reported more delinquency, which would suggest that a relationship may be present in the current study. Hines and Saudino (2008) also noted that physical aggression is associated with higher levels of openness. A person who is curious and adventurous may be more likely to engage in deviant acts than those with lower scores on the variable.

Ha2: There is a significant, negative relationship between conscientiousness and criminal behavior.

As with agreeableness, elements of psychoticism are subsumed under the construct of conscientiousness in the FFM. The expected results may be negative due to reverse scoring on the psychoticism measure. Individuals who have lower scores on conscientiousness have been shown to be more likely to abuse substances (John, Naumann, & Soto, 2008). Laak et al. (2003) and Wiebe (2004) have both shown that individuals with lower scores on conscientiousness are more likely to be involved in deviance. Clower and Bothwell (2001) argued individuals lower on conscientiousness are also more likely to be arrested. Violence is also correlated with low scores on conscientiousness (Hornsveld & de Kruyk, 2005), and perpetrators of rape have been shown to have lower conscientiousness scores than non-perpetrators (Voller & Long, 2010).

Ha3: There is a significant, positive relationship between extraversion and criminal behavior.

Eysenck's theory suggests that those individuals higher in extraversion will also report higher incidences of criminal behaviors (Eysenck, 1964). In Research to date, some studies have also supported this finding (Rushton & Chrisjohn, 1981; Burgess, 1972). Extraversion was found to have a significant impact on crimes against people (Alexio & Norris, 2000), status offenses (Laak et al., 2003), and use of aggression among women (Weibe, 2004).

Ha4: There is a significant, negative relationship between agreeableness and criminal behavior.

Studies using the FFM of personality have generally shown that there is an inverse relationship between agreeableness and deviance. Miller and Lynam (2001) showed that higher levels of agreeableness corresponded with increased crime rates. Other studies have shown agreeableness to be correlated not only with crime, but with violence (Hornsveld & de Kruyk, 2005; Hines & Saudino, 2008; Voller & Long, 2010).

Though there is no concept of agreeableness in Eysenck's original theory, as mentioned previously, elements of psychoticism are included in the agreeableness construct in the FFM. High scores on psychoticism are associated with low scores on agreeableness, thus the expected relationship will be negative. High levels of Psychoticism have been found to have a significant impact on criminal behavior in numerous studies (Allsop & Feldman, 1974; Eysenck, 1970; Mak et al., 2003).

Ha5: There is a significant, positive relationship between neuroticism and criminal behavior.

As explained in the PEN model, individuals with higher scores on neuroticism will have higher rates of criminal behavior. Research has suggested that criminal populations such as prisoners routinely have higher scores on neuroticism (Addad & Leslau, 1990; Burgess, 1972; Eysenck & Eysenck, 1977). Neuroticism was even found to be significant regardless of the offense under examination (Bartol & Holanchock, 1979; Rahman & Husain, 1984). In more recent studies, high levels of neuroticism are associated with increased use of aggression among men and women (Hines & Saudino, 2008) and increased sexual violence (Hornsveld & de Kruyk, 2005).

The following is a summary table of the previously described hypotheses:

Table 1

Hypothesized Relationship Between Personality and Offending

Personality Factors	Offending
Openness	+
Conscientiousness	-
Extraversion	+
Agreeableness	-
Neuroticism	+

In addition to the traditional questions about the relationship between personality and deviance, the current study was also an attempt to examine the relationship between personality factors and co-offending. Only the factors of extraversion and neuroticism have been shown to be related to co-offending in prior research.

Ha6: Individuals with higher scores on openness will also have higher levels of co-offending.

As previously explained, high scores on openness suggests that an individual is more likely to be adventurous and enjoy new experiences. It is possible that this type of person would be more likely to be open to engaging in, or following friends into criminal activities.

Ha7: Individuals with higher scores on conscientiousness will also have lower levels of co-offending.

When examining child sex offenders, Bijleveld and Hendriks (2003) noted that those juveniles who committed crimes alone scored higher on impulsivity. John and Srivastava (1999) contended conscientiousness is one way to describe someone with the ability to control their impulses. Someone with higher levels of conscientiousness would then be more likely to commit deviant acts alone than with a group.

Ha8: Individuals with higher scores on extraversion will also have higher levels of co-offending.

Bijleveld and Hendriks (2003) examined juvenile sex offenders using the personality trait of "sociability." Sociability is also seen as an aspect of extraversion in the FFM. In this study, solo offenders scored significantly lower on extraversion than those who committed crime in groups. Therefore, those individuals who commit deviant acts with others are more likely to have higher scores on extraversion.

Ha9: Individuals with higher scores on agreeableness will also be more likely to have higher levels of co-offending.

While the relationship between agreeableness and co-offending has not been examined in the literature, an inference as to the probable direction of this relationship can still be made. High scores on agreeableness are associated with being social and working well in community with others (John & Srivastava, 1999). For individuals with such concern for others and who work well in groups, it is logical that such people would also be more likely to commit deviant acts in groups.

Ha10: Individuals with higher scores on neuroticism will also be more likely to have lower levels of co-offending.

In the same study of juvenile sex offenders mentioned above, Bijleveld and Hendriks (2003) found that juveniles who committed crimes alone scored higher on neuroticism than those offenders who committed crime in a group.

Since there is little research on deviant acts committed by individuals versus groups, it is difficult to make such a prediction. However, according to Bijleveld and Hendriks (2003), those participants who committed crimes alone were much more likely to report significantly higher scores on neuroticism. This difference was noted in reference to offenders who committed crimes in groups, who reported “normal” scores. Table 2 summarizes hypotheses six through ten.

Table 2

Hypothesized Relationship between Personality and Co-Offending

Personality Factor	Co-Offending
Openness	+
Conscientiousness	-
Extraversion	+
Agreeableness	+
Neuroticism	-

Independent Variable**Personality**

Personality was measured using the Big Five Inventory (John, Naumann & Soto, 2008). The Big Five Inventory (BFI) was a 44 item scale that measures each of the five broad domains in the FFM. The survey items consisted of short phrases comprised of relatively simple language (John, Naumann, & Soto, 2008). The questionnaire items were selected based on a factor analysis of large samples of college and university student responses. The BFI is free and open to the public for non-commercial research use.

In the realm of questionnaires that tap into the FFM, there are a few prominent surveys. One is the Neuroticism, Extraversion, Openness Personality Inventory Revised (NEO-PI-R), and the other is a lexical approach to survey design popularized by Goldberg (1982). While both surveys are widely used and shown to be reliable and valid, they also both have limitations that have been addressed by using the BFI.

The BFI was chosen for the present study for several reasons. The BFI is brief and consists of 44 items as opposed to the 240 item NEO-PI-R and the 100 item lexical survey. A shorter survey would decrease the likelihood of testing fatigue and allow the survey to be administered within the timeframe of one class session. The BFI also presents items as short phrases. The NEO-PI-R employs complete sentences, while the lexical approach uses single adjectives. By meeting in the middle of these two approaches, the BFI is not as complex and time consuming as the NEO-PI-R. However, the BFI offers more clarity than the lexical approach by putting the adjectives in context to avoid confusion on the part of the respondents.

Despite the fact that the NEO-PI-R and the lexical survey are utilized more often in the research, the BFI has been shown to be just as reliable as the other surveys. John, Naumann and Soto (2008) contended the mean alpha reliabilities for the lexical scales are .84 and .81 for the NEO-PI-R. The BFI falls in the middle of both instruments with a reliability of .83. John, Naumann, and Soto (2008) also examined the convergent validity for each instrument. In comparing the scales for the BFI and lexical, the convergent validity ranged from .82 to .99, while the BFI and NEO-FFI reported a range of .87 to .99 for convergent validity. The authors attributed the differences in validities to differences in the way each survey defined the five factors, as well as differences in facet scales. However, the BFI only covers the five broad domains rather than the facets of each domain.

The personality factors being examined (OCEAN) were discussed in Chapter Two. However, it is important to address how each factor is defined and scored in the BFI. The individual scales consist of between eight and ten items. Responses for each

item are between 1-5 on a Likert scale. The scores for all of the items in the scale are added, and the average is calculated. Some of the items in a scale may be reverse coded (R), so to score these items the score recorded by the participant is subtracted from six to determine the actual score.

Each scale has a value between one and five. To make the values meaningful, the scores were transformed into a more intuitive measure known as a percentage of maximum possible scores (POMP) (Cohen, Cohen, Aiken, & West, 1999). The POMP score transformed the data to a scale of 0-100, with zero being the lowest possible score and 100 representing the highest possible score. Srivastava, John, Gosling, and Potter (2003) transformed the BFI into POMP scores by taking the scale score (of 1-5), subtracting one, and multiplying the result by 25. Following the same process in the current study not only made the results more intuitive, but allowed comparison to a norm sample gathered by Srivastava et al. (2003). The norm sample consisted of 132,515 participants between the ages of 21 and 60 who were all administered the BFI. Sample means are as follows:

Openness – $M = 74.5$, $SD = 16.4$

Conscientiousness – $M = 63.8$, $SD = 18.3$

Extraversion – $M = 54.6$, $SD = 22.6$

Agreeableness – $M = 66.4$, $SD = 18.0$

Neuroticism – $M = 51.0$, $SD = 21.9$

Openness is defined as the originality of a person's mental life. The coefficient alpha of the 10 item openness scale is .83. The scale asks respondents about such behaviors as "comes up with new ideas" and "has an active imagination."

Questionnaire items to measure openness are as follows (The notation (R) denotes reverse coding of the item):

- 5. Is original, comes up with new ideas
- 10. Is curious about many different things
- 15. Is ingenious, a deep thinker
- 20. Has an active imagination
- 25. Is inventive
- 30. Values artistic, aesthetic expression
- 35. Prefers work that is routine (R)
- 40. Likes to reflect, play with ideas
- 41. Has few artistic interests (R)
- 44. Is sophisticated in art, music, or literature

Conscientiousness refers to a person who exhibits self-discipline and impulse control. The alpha of the scale is .82. Some of the items in the 9 item scale ask respondents the extent to which they are “a reliable worker” and “perseveres until a task is finished.” The following items measure conscientiousness (The notation (R) denotes reverse coding):

- 3. Does a thorough job
- 8. Can be somewhat careless (R)
- 13. Is a reliable worker
- 18. Tends to be disorganized (R)
- 23. Tends to be lazy (R)
- 28. Perseveres until the task is finished
- 33. Does things efficiently
- 38. Makes plans and follows through with them
- 43. Is easily distracted (R)

Extraverts are energetic and social, and experience positive emotionality. The alpha for the 8 item scale is .86. The items ask if individuals are “outgoing and sociable” and are “full of energy.” Extraversion is measured by the following eight items (The notation (R) denotes reverse coding):

- 1. Is talkative
- 6. Is reserved (R)
- 11. Is full of energy

- 16. Generates a lot of enthusiasm
- 21. Tends to be quiet (R)
- 26. Has an assertive personality
- 31. Is sometimes shy, inhibited (R)
- 36. Is outgoing, sociable

People who are agreeable are known as compassionate and cooperative people.

Survey items in the nine item scale ask if the participant “is helpful and unselfish” and if they are “considerate and kind to almost everyone.” The alpha coefficient for this scale is .79. Agreeableness has been operationalized using the following nine items (The notation (R) denotes reverse coding):

- 2. Tends to find fault with others (R)
- 7. Is helpful and unselfish with others
- 12. Starts quarrels with others (R)
- 17. Has a forgiving nature
- 22. Is generally trusting
- 27. Can be cold and aloof (R)
- 32. Is considerate and kind to almost everyone
- 37. Is sometimes rude to others (R)
- 42. Likes to cooperate with others

Those individuals suffering from neuroticism have a tendency to experience negative emotion. The eight item BFI scale asks if individuals often feel “depressed or blue” or “worry a lot.” The alpha for the scale is .87. The scale has been provided below (The notation (R) denotes reverse coding):

- 4. Is depressed, blue
- 9. Is relaxed, handles stress well (R)
- 14. Can be tense
- 19. Worries a lot
- 24. Is emotionally stable, not easily upset (R)
- 29. Can be moody
- 34. Remains calm in tense situations (R)
- 39. Gets nervous easily

Dependent Variables

Offending

There are many types of crimes that have been examined over time that apply to adult and college populations. In terms of the relationship between offending and personality, many different types of crimes have been examined. Offenses range from homicide (Blackburn, 1971; McGurk, 1978), drug use (McGuire & Megargee, 1974), shoplifting (Beck & McIntyre, 1977), sexual crimes (Hornsveld & de Kruyk, 2005) and even white collar crimes (Blickle et al., 2006).

To best summarize a wide variety of crimes and offenses, a typology or classification system is necessary. In 1967, Glaser proposed a typology that included various types of crimes that divided crimes into four main categories. The first category of crime was predatory crimes. These are the majority of crimes that are considered most severe by the general public and have serious negative sanctions. Predatory crimes were divided into crimes against persons, crimes against property, and white collar crimes. Crimes against persons and property had a clearly chosen victim where property was taken or the victim was assaulted. White collar crimes referred more to behaviors such as forgery, embezzlement, and check forging. White collar crimes were omitted from the current study because there was not expected to be much variability since the sample was comprised of college students.

The second category was illegal service crimes. These are crimes that do not appear to have a specific victim, yet involve some sort of relationship between the criminal and others who may be considered "customers." Examples would be prostitution, drug crimes, or gambling. The third category was public disorder crimes that also lack a specific victim, yet are considered crimes when others are offended or

likely to be offended. Drunkenness, disorderly conduct, and vagrancy are key examples. The fourth and final category was negligence offenses in which there is an unintended victim. Such crimes as speeding, DUI, and other driving violations are prime examples.

The measurement instrument for this study was Elliott and Ageton's (1980) revised self reported delinquency scale. This 47 item scale was created to address previous methodological criticisms, and has been used to gather data for the National Youth Survey. The typology for this scale is based on Glaser's typology and is as follows:

1. Offenses against persons
2. Property offenses
3. Illegal service offenses
4. Public disorder offenses
5. Analogous offenses
6. Drug offenses

In this survey, the category of predatory crimes has been divided to reflect the differences in violent crimes against people and other serious predatory crimes. A category for drug use was also added to include "hard" drugs, along with alcohol and marijuana use, which were previously included in illegal service and status crimes (Elliott & Ageton, 1980). The scale covers all but one of the Uniform Crime Report Part I offenses (homicide is omitted) and 60% of Part II offenses. Participants were asked how many times in the past year they had participated in each of the offenses included in the survey.

Co-Offending

Co-offending is defined as “the act of committing crime alongside one or more accomplices” (van Mastrigt & Farrington, 2009). Co-offending was measured using one simple question on the survey. Participants were asked how often they usually commit crimes with others. The answer choices ranged from never to always on a five point Likert scale. Since the current research is concerned with whether or not co-offending occurs rather than counting the number of incidents of co-offending, this measure is adequate to obtain the required information.

Control Variables

In addition to the variables already listed, it was important to make sure that the resulting relationships were due to correlations in personality and deviance rather than other variables shown to be related to crime. Since the current study utilized a non-experimental design, other factors that effect the dependent variable need to be statistically controlled for, allowing stronger conclusions to be made regarding the relationship between personality and deviance or co-offending.

Social Desirability

One of the common concerns in self report research is controlling for social desirability bias. Social desirability is the idea that people will answer questions in ways that will make them look more positive than they would if they answered honestly, or provide answers that are considered to be more socially acceptable (Crowne & Marlowe, 1960; Fowler, 1995). This concept is included as a variable to control for biased or false answers. To measure this variable, the Marlowe-Crowne Social Desirability Scale (1960) is recognized as being a good measure. The scale consists of

33 true-false questions, asking about the respondents own behaviors, and does not include any pathology related content (Barger, 2002). Eighteen of the questions are positively keyed (showing social desirability) and 15 items are negatively keyed (showing a lack of social desirability). The higher one scores on the inventory, the more likely that person is to falsely answer questions.

For this particular study, to reduce the likelihood of testing fatigue, a 10 item short form of this scale was used. Strahan and Gerbasi (1972) created two 10 item scales (M-C 1 and M-C 2) from the original 33 item scale. The M-C 2, which will be utilized in this study, asks participants to answer true or false to questions such as “I can remember playing sick to get out of something” or “I am always courteous, even to people who are disagreeable.” Both 10 item scales have been shown to have similar means and reliabilities (Strahan & Gerbasi, 1972). When subjects give the socially desirable answer, that is most likely untrue for most people, counts for one point. The points were then totaled and divided by 10, which results in a measure of social desirability on a scale between zero and one.

Demographics

Basic demographic variables that were examined in the current study were race, age, and sex. As research from the previous chapter has shown, age (Eysenck & Eysenck, 1977) and race (Eysenck & Eysenck, 1971) have at times been correlated with criminal behavior.

Age

When it comes to co-offending among adults, there is a scarcity of literature in that area. The majority of co-offending research focuses on juvenile offenders.

Stolzenberg and D'Alessio (2008) suggested that, simply because there is a decrease in crime overall as individuals age, that does not lead to a conclusion that co-offending is not present among adult populations. Van Mastrigt and Farrington (2009) found that the average age for co-offending was 21.9 and the average age for solo offending was 26.5.

Race

In the personality literature and research, Eysenck (1970) noted a difference between white and minority railroad workers on personality scores. However, the exact differences were unknown because all minority workers were removed from the sample. Despite this finding, Bartol and Holanchock (1979) included various races/ethnicities in his analysis of the impact on personality and crime. The findings did not report any significant differences among the groups. In addition, race has been shown to be correlated with co-offending. Stolzenberg and D'Alessio (2008) found that the peak ages for offending were the same among both Black and White individuals.

Sex

Sex, the genetic differences between male and female, has at times been shown to be significant for deviant activities (Mak et al., 2003; Price, 1968). The majority of research on co-offending has focused on populations that were almost exclusively male (Erickson, 1971; Hodgson & Costello, 2006; McCord & Conway, 2005). Females were found to have higher scores on personality scales than males, "normal" individuals, and even prisoners. In one study, females were actually slightly more likely than males to participate in co-offending (van Mastrigt & Farrington, 2009).

Sample

In a vast majority of prior research, incarcerated offenders have been utilized for samples. While this may seem effective in examining the relationship between personality and deviance, there are also obvious problems. Incarcerated offenders have committed some type of crime (except for exceptional cases) so it makes sense that there will be a relationship between the two factors. However, prisons also contain a large number of people who are more accurately diagnosed as psychopaths or sociopaths, and also have a number of mental health diagnoses. This would cause problems when trying to generalize results to the rest of the population. However, the present study seeks to include what one could consider the “average” or “normal” person. Therefore a college student population was utilized.

The students selected for participation were students attending a Northeastern university in a rural area. The student population was made up of students from 45 states and 73 countries. Students chosen for the study sample consisted of undergraduates at the university.

There were obvious external validity concerns with using a student population for a study. The sample was not necessarily representative of the general population outside of a university community. However, as mentioned previously, this sample gave a decent proxy measure of a “normal” population of people who were neither incarcerated offenders nor mentally unstable.

Sampling Procedure

The sampling process consisted of a simple random sample. Subjects were selected using a simple random sample of currently enrolled university students during

the spring semester of 2011. All student campus email addresses were included in a list. A sample of 2,000 students was chosen randomly from that list by the applied research lab on campus. The entire sample group was then emailed the survey information.

Introductory messages were emailed to the targeted individuals informing them that they would be receiving information asking that they participate in the survey (Appendix A). Sending a pre-notice email a few days before the actual survey improves the likelihood of survey completion (Dillman, 2007). The pre-notice email informed the sample that they would be receiving a survey at the same email address and were invited to participate.

A few days later, the Qualtrics link to the survey was included in an invitational email message (Appendix B). The email explained the purpose of the survey and the specifics of informed consent. Individuals were informed that participation in the survey was voluntary, the survey was anonymous, and that the participant must be 18 years old to participate. Contact information for the researcher was provided to address any questions that students might have had. The link to the survey was included in the email along with an option to opt out of future emails.

The Qualtrics survey does not require any special computer software and all data collection took place online. Once the participant clicked on the link provided in the email message, (s)he was immediately directed to the survey page. The participant had the option to stop in the middle of the survey, save completed questions, and finish the survey at a later date. A follow-up email prompting completion of the survey was sent to those who responded positively to the invitation, but who failed to complete the survey

(Appendix C). Once the survey was completed and submitted, a final thank you message was displayed (Appendix D).

Approximately one week after the survey opened, everyone in the sample who had not yet completed the survey was sent a reminder email. This email was sent to increase the likelihood of completion by individuals who might have forgotten about the survey or disregarded the prior emails (Dillman, 2007). The reminder email included the link to the survey in case the individual no longer had the original email.

Once the survey closed, all individuals who had completed the survey were sent a thank you email. The email expressed gratitude for participation in the study and again provided contact information for the researcher. Individuals who requested a copy of the results were assured that they would be provided with the requested information at the conclusion of the study.

A count of the emails was also tracked. Data was collected in real-time. At any time, the principal investigator could log into the Qualtrics website and the results could be viewed and analyzed. Qualtrics provides a substantial offering of data management. The data collected from the survey was then coded and exported into SPSS 19.0 for data analysis.

Human Subject Protections

After submission of the research plan to the Institution Review Board, this study was deemed to be one of minimal risk to participants as determined by the U.S. Federal Government Department of Health and Human Services (2009) regulation 45 CFR § 46.10, which states the probability and magnitude of harm or discomfort anticipated in the research should not be greater in and of themselves than any ordinarily

encountered in daily life, or during the performance of routine physical or psychological examinations or tests.

There were four human subject protections issues apparent in the current study. The first was the issue of voluntary participation. This issue was addressed by allowing students to refrain from participating in the study. Since the study was conducted using online surveys, students were not pressured or required to take the survey. If a student was not interested in participating, they had the right to ignore the email requests and refrain from starting the survey. Once a student began the survey, they were informed that at any time they could discontinue the survey by simply closing their browser. They were able to return at any time to complete the survey, but were not required to do so.

Prior to completing the survey, participants were given all information about informed consent in an email that detailed the purpose of the study (Appendix A). They were also informed of any possible risks and benefits to participating in the study. In addition, the email clearly stated that their participation was completely voluntary and that they could withdraw from participation at any time, with no adverse effects. Continuing to complete the survey indicated understanding and acceptance of this information.

The researcher also addressed the issue of harm to participants. In this study, there was no more harm in filling out the surveys than in taking any other test or survey in any class. The information is submitted anonymously, and there were no questions about sensitive topics or victimization. In addition, the findings were reported in the aggregate, so no individual person could be the focus of the study.

Finally, there is an issue of anonymity in the data collection. Surveys were sent through email utilizing the Qualtrics system. No identifiers were listed with the email addresses prior to sending the emails, so surveys were anonymous. Qualtrics automatically distributed follow up emails to students without identifying who did or did not complete the surveys. Once a survey was completed and stored, Qualtrics displayed a unique code for each email address, but did not allow access to any identifying information. No surveys contained identifying information, names, or numbers. There was no way to connect any survey to any one individual.

Qualtrics has SAS 70 Certification and meets the rigorous privacy standards imposed on health care records by the Health Insurance Portability and Accountability Act (HIPAA). All Qualtrics accounts are hidden behind passwords and all data is protected with real-time data replication. The password to access results was known only by the principal investigator. All data will be stored in a secure environment for 3 years after completion of the study, after which it will be destroyed.

Method of Data Analysis

To test the hypotheses included in the study and answer all research questions, multivariate analyses was used. This type of analysis allowed the control of possible rival causal factors, and examined the impact of the independent variables (personality factors) on the dependent variable (either deviance or co-offending). The nature of the dependent variable determined the exact statistical technique to be employed for each model. The following analysis is broken down into three key phases: Phase 1 that consists of preliminary statistics to summarize the data, Phase 2 that addresses the

research hypotheses, and Phase 3 that assigns membership into several offending groups.

Phase 1

To begin the analysis of the data collected the reliability of the scales was examined first. While the reliability of the measure has been reported in the literature, a Cronbach's alpha was run to determine the reliability of the measures in this particular study. DeVellis (1991) posited "alpha is defined as the proportion of a scale's total variance that is attributable to a common source, presumably the true score of a latent variable underlying the items" (p. 27). The purpose of this statistic was to determine how well the items in the scales included in the study were internally consistent and reflective of the same underlying construct.

Next, the items were analyzed to determine if there was any effect due to social desirability. The social desirability scale determined if answers to the survey items were due to the desire to be presented in a favorable light. If one was answering the social desirability scale in this way, then it was possible to exclude those surveys and preserve the integrity of the data.

Content validity of the scales was also examined. Content validity determines if all the items in the scale are measuring the same unitary construct. To test for content validity, inter-item correlations were run.

Construct validity determines if the items in a scale are all accurately reflecting the theoretical construct being measured. For the personality scale, it is difficult to find a test to evaluate the construct validity. There has been much dissention among researchers as to the construct validity of the FFM as a whole. However, as discussed

earlier, this model is the most widely accepted in the psychological community. In light of this information and the comparison to the NEO-PI-R model, the scale appears to have construct validity.

To test this assumption of construct validity, correlations between the scales and validation items were examined. Included in the survey were five validation items to measure the same concepts as each individual personality factor scale. For example, “Tends to be active and energetic” is a conceptual definition of extraversion. The extraversion scale was compared to this validation question to determine if they were correlated. The closer the correlation is to one, the more closely both measures are focused on the same construct. Therefore, a correlation of one in this instance would suggest that the extraversion validation item and the scale were both measuring the same thing.

Descriptive statistics were run to compare the sample to the total population from which the sample was derived. The sampling strategy explained previously has been shown to produce representative samples in past research, and proved to do the same in this study as a probability sample. Possible implications of a non-representative sample were also considered.

Descriptive statistics provided an overall picture of the data in a very simplified format. First, the measures of central tendency (mean, median and mode) were examined. Next, the standard deviation was included as a measure of dispersion. The standard deviation measured the spread or range of the values in the data set, and showed the amount of variation from the mean. Finally, measures of the shape of the data were examined. Skewness measured the asymmetry of the data, and showed if

there was more data in one of the tails than would be expected in a normal distribution. Skewness between negative one and positive one indicates that the distribution is not skewed. Kurtosis measured the peak of the data and the probability of having extreme values in the data. Kurtosis scores between negative and positive one do not denote a problem with the data. A kurtosis below -1.0 indicates that the peak of the distribution is low. The closer the number gets to -1.0, the closer the distribution is to being flat. A kurtosis above +1.0 suggests that the distribution has a high peak. Frequencies of the data were run as well, to show how often certain answers occurred in the data set. Frequencies were also run for control variables such as age, race, and sex.

Finally, correlations were examined within the data. Correlations showed the degree of the relationship between two variables, in addition to the strength and direction of that relationship (DeVellis, 1991). If the associations were significant, then the null was rejected, but there was still a chance of a type one error. If the independent variables did not have a coefficient above .70 when they were correlated with each other, then collinearity was not a salient concern. In particular, any possible instances of multicollinearity, or strong relationships between the independent variables, were examined. If multicollinearity existed in the model, then it would have been difficult to separate the effect of each independent variable on the dependent variable (Allison, 1999). Correlations provided a surface-level indication as to whether multicollinearity existed among the variables; however, tolerances and VIFs provided specific tests for multicollinearity. Therefore, in addition to a close examination of the correlation matrix, the tolerance and variance inflation factor were also examined.

Phase 2

In this phase of the research, the hypotheses of the study were examined. First, the relationship between personality and the frequency (or amount) of offending were examined. Hypotheses 1-5 considered the impact of each personality factor on overall deviance. To test this relationship, Ordinary Least Squares (OLS) was used. OLS regression was run since the dependent variable was continuous (Lewis-Beck, 1980). This statistic tested the effect of multiple independent variables on one dependent variable while controlling for rival causal factors. In other words, OLS showed the effect that personality factors had on the frequency of offending acts. This was especially helpful in the current research since participants were not randomly assigned to personality groups and differed on other variables.

There were a few items of particular interest to this study in the OLS regression output. First, unstandardized slopes indicated the change in offending that was in response to a one unit increase in each personality factor. The R^2 showed the percentage of variation in the dependent variable that was explained by the independent variables. The R^2 helped to determine if all relevant independent variables were included. Anything less than 100% of the variance being explained (or $R^2 = 1.0$) indicated that some of the variance was still unexplained; therefore, relevant variables were missing. For example, if it was found that personality factors accounted for 30% of the variance (or $R^2 = .30$), then personality explained only part of why individuals offend. However, 70% was still unexplained and indicated that there were additional variables that contributed to fully explaining offending.

In addition to R^2 , the Betas were also very important in regression. The Beta standardized the slopes and converted them into a z score. This allowed comparisons to be made even though the variables may be measured using different units or scales (Menard, 2002). It also allowed for a comparison of the strength of the slopes so that a determination could be made as to which independent variables had the most affect on the dependent variable. In this particular study, beta scores allowed a comparison of the affect of personality factors on offending. More importantly, it was easy to determine which factors had the largest effect. If the beta score equaled one, it meant that a one unit increase in the independent variable was associated with a one unit increase in the dependent variable.

For the second step of the analysis process, the relationship between personality factors and different types of offending was examined. The impact of the five personality factors on each of the six types of offending in Glaser's typology was examined using separate models for each type of offending. To be clearer, the survey questions were divided into groups to represent each type of offending. The frequencies reported for each offense within that category were added together. The minimum number of reported incidents for each offense type was zero. To deal with a broad range of scores, an index was created for each offense type. Each act within a specific offense type was recoded as zero if the individual had never committed the offense, and one if any level of involvement was reported. This allowed for an index that could more accurately measure the amount of involvement in a particular offense. The resulting indexes are discussed in more in the following chapter.

While the six types of offending are nominal level classifications, the frequency of participation in each type was calculated, which was a ratio level measure. Since both the independent and dependent variables were continuous, OLS regression was used for this analysis as well. As previously mentioned, separate models were used for each model. For each model, unstandardized slopes indicated the change in each type of offending that was associated with a one unit increase in each personality factor.

The third step was to examine the question of the relationship between personality and participation in overall co-offending. Here, the question was whether there is a relationship between personality factors, and whether or not an individual participated in co-offending at some level. Hypotheses 6-10 were addressed in this analysis. In the study survey, co-offending was measured on a five point Likert scale. To better analyze this data, co-offending responses were reduced to three groups. Individuals who did not report any offending were put into one group. The second group consisted of individuals who did offend, but reported offending alone. The third and final group consisted of individuals who reported any incidents of co-offending. All non offenders were removed from the data, leaving only solo and co-offenders for analysis. Breaking down co-offending in this way allowed for an analysis of the relationship between personality factors and the various levels of overall co-offending that now has practical meaning. For this analysis, Logistic Regression was used since the final two groups (solo offenders and co-offenders) were dichotomous measures.

Logistic regression was used when the different groups of a dependent variable were dichotomous. This statistic considered the probability of an event occurring and predicted a categorical dependent variable. Logistic regression reported the changes in

the log odds of an event occurring, which in this case was belonging to the co-offending group.

The final step examined the relationship between personality factors and different types of co-offending. The six types of offending also followed Glaser's typology. Responses were separated into two groups – those who did not engage in co-offending at all, and those individuals who engaged in co-offending at any point in time. Co-offending was also divided by offense types and examined. Only individuals who reported involvement in offending were included in the analysis for co-offending by offense type. Due to the variable measurement, logistic regression was also used for this section of analysis.

Phase 3

It was also important to examine the difference between individuals who co-offend, individuals who solo offend, and those individuals who do not offend at all. To test for possible differences between these groups, a multinomial logistic regression was run. The purpose is to determine whether or not the independent variables (which for this model are openness, conscientiousness, extraversion, agreeableness and neuroticism) played a different role or a bigger role in whether or not someone offended in any of the above mentioned three groups.

The analysis for this stage of the process was much like the previous stages. First, co-offending was broken down into three groups. The first group consisted of individuals who never offended at all. The second group consisted of individuals who only offend alone. The third group consisted of individuals who were co-offenders on any level (rarely, sometimes, or often offend with others).

Since this statistic needed overall co-offending data, this allowed the inclusion of all individuals in the sample and separation into the necessary three groups. To compare the affect of personality factors on these three nominal level groups, multinomial logistic regression was necessary. Multinomial logistic regression allowed for a comparison of dependent variables with more than two groups. The data in this type of analysis left one category out of the analysis as the reference category. This allowed all other categories to be compared individually to the reference category, which had a value of zero. Then, binary logistic regression models were run for each grouping. This reported the impact of the independent variables on the likelihood of being included in a particular category when compared to the reference category.

There are a few key items to note in the multinomial regression output. The Pseudo R^2 reported the amount of the variance in the categorical dependent variable that can be explained by the model. To further examine the model, the likelihood ratio showed which variable had the most significant impact on the -2 Log Likelihood.

Analytical Plan

Table 3 summarizes the analytical plan. The table shows the three phases of analysis. Included is the nature of the unit of analysis, the hypothesis or proposition that was tested, and the procedure.

Table 3

Summary of Research Analysis Plan

Nature of Analysis	Hypothesis or Proposition Tested	Procedure
Phase 1		
Item analysis of individual scale items		
Reliability of Personality scale	Internal consistency of the scale	Cronbach's alpha
Content validity of the personality and delinquency scale	Do all the items in the scale represent the same construct?	Inter-item correlations, inspect content of the items
Construct validity of personality scale	Do items accurately reflect the theoretical constructs being measured?	Correlations between scales and validation items
Social Desirability	Extent to which items are influenced by social desirability	Correlation between items and the social desirability scale
Demographics	Is the sample representative of the population?	Comparison of sample and population on relevant demographics, descriptives and frequencies
Phase 2		
Association between personality and offending	Personality factors effect frequency of deviance	OLS Regression
	Personality factors effect on each type of deviance	OLS Regression
Association between personality and co-offending	Personality factors effect on overall co-offending	Logistic Regression
	Personality factors effect on different types of co-offending	Logistic Regression
Phase 3		
Test model of personality with co-offending, solo offending, and non offending	Interaction between OCEAN and co-offending (versus solo offending and non-offending)	Multinomial Logistic Regression

CHAPTER FOUR RESULTS

The current research was an effort to answer questions about the nature of the relationship between personality and offending. First, this study was intended to examine the impact of personality factors in both offending and co-offending. Second, the relationship between personality and different types of offending and co-offending were examined. Finally, this study was intended to determine whether personality factors could assist in determining who would be more likely to avoid offending, offend alone, or offend with friends.

This chapter is a presentation the results of the data analysis in three phases. In Phase One of the data analysis, preliminary statistics are presented to summarize the data. First, descriptive statistics will be presented to give an overall picture of the composition of the sample and the distributions of the data for all variables in the models. Correlations between the variables in the model will then be presented to show bivariate associations between the variables. Finally, the validity and reliability analysis for each of the scales used in the model will be examined.

In Phase Two, the multivariate relationships between personality factors and offending are presented while controlling for rival causal factors. In addition, the relationships between personality factors and co-offending are explored. Phase Three is intended examine the potential personality differences between three distinct groups: non-offenders, solo offenders, and co-offenders.

Phase One

Sample Characteristics

The data for the research was collected using online surveys. Two thousand students were sent invitations to participate in the research. Three hundred fifty-four participants actually took the survey; however only 305 surveys were completed. The final analysis included only the 305 completed questionnaires.

The population from which the sample was obtained consisted of 15,126 college students. An overview of the demographic variables indicates that of the 305 respondents, the majority of the respondents (67.2%) were females and 32.8% were males. In comparison, 57% of students at the university are female and 43% are male. Though ages of individuals in the sample ranged between 18 and 59, note that approximately 80% of the sample population fell between the ages of 18 and 26 years old. Ninety-two percent of the university population falls into the traditional college ages of 18-22. In reference to race, 90.2% of the sample was white, 5.2% was African American, 2% was Asian 1.6% was Hispanic and .7% was Native American. The university population for the 2010-2011 academic year was 77.65% white, 9.47% African American, 1.08% Asian, 1.98% Hispanic and .23% was Native American. Table 4 below shows a comparison of the sample and population on relevant demographic characteristics.

Table 4

Comparison of Descriptive Statistics for Student Population and Sample

Demographic Characteristics	Student Population (N=15,126)	Study Sample (N=305)
Age		
Mean Age	20.00	24.19
Gender		
Male	43.10%	32.80%
Female	56.90%	67.20%
Race		
African American	9.47%	5.20%
Asian	1.08%	2.00%
Hispanic	1.98%	1.60%
Native American	0.23%	0.70%
White	77.65%	90.20%
Other	9.59%	0.30%

It would appear that the research sample roughly matches the university population as a whole, with a few exceptions. However, since the sample is only made up of roughly 2% of the total population, it may not be possible to generalize to the full university population. This is not a salient concern in the current research. General information on the offending habits of the sample and the personality characteristics of the sample are discussed below.

Summary of Personality Scales

For each scale, respondents were asked to determine to what extent a series of statements applied to them. The answers ranged from “Agree strongly” to “Disagree strongly” on a five point Likert scale. Each personality factor had between 8 and 10 questions in the factor scales. The answers for each scale were combined and the total

for each scale was then turned into a percentage of maximum possible scores (POMP) score. This transformation of the personality scales makes the scales a more intuitive measure with a value ranging from 1-100. POMP scores also allow for standardization and easy comparison among the different scales.

Reliability Analysis of Personality Scales

A scale was a group of questions that were analyzed together where each question was intended to measure the same unitary construct. Personality factors were measured using the Big Five Inventory scales.

Reliability refers to the consistency of a measure. In this study, Cronbach's alpha was used to measure the internal consistency of items in each of the scales. This statistic shows the extent to which all of the items or questions in a scale measure the same construct. A score of one would indicate that the items together are perfectly measuring the same construct, with no items missing. Anything less than one would show the extent to which the items as a whole were all measuring the same construct, but could also mean that some possible items were missing from the scale that would make it more complete. Devellis (1991) presented guidelines for acceptable alpha levels: "below .60, unacceptable; between .60 and .65, undesirable; between .65 and .70, minimally acceptable; between .70 and .80, respectable; between .80 and .90, very good; much above .90 one should consider shortening the scale" (p. 85).

The following discussion provides an in-depth analysis of the reliability of each personality factor scale. Alpha scores reported for all personality factors had a possible range of zero to one. The actual observed range fell between .774 and .871. All of the alphas were very respectable and acceptable for use in social research. The mean

alpha reliabilities for the Big Five Inventory (BFI) personality scales in this study was .82, which is very close to the reliability of .83 reported by John, Naumann, and Soto (2008). Item-Total Correlations were also included for each scale.

Item-Total Correlations show the extent to which an item is correlated with the overall scale. For this statistic, the Pearson correlation coefficients are presented. If any individual item had a small correlation (of .3 or lower) it indicated that the item was not measuring the same construct as all of the other items in the scale. Such items were dropped from the scale.

Openness. Openness refers to someone who has a broad range of interests and is willing to experience new or different things. Openness was measured using a ten item Likert scale.

Table 5

Reliability Analysis of the Openness Scale

Question	Item-Total Correlation	Alpha If Deleted
Is original, comes up with new ideas	0.501	0.749
Is curious about many different things	0.405	0.761
Is ingenious, a deep thinker	0.476	0.751
Has an active imagination	0.534	0.745
Is inventive	0.545	0.742
Values artistic, aesthetic experiences	0.549	0.741
Likes to reflect, play with ideas	0.545	0.744
Is sophisticated in art, music, or literature	0.468	0.752
Prefers work that is routine	0.175	0.796
Has few artistic interests	0.383	0.768
Cronbach's Alpha = .774		

As previously mentioned, low total-item correlations indicate that an individual item is not adequately correlated with the overall scale. Regarding Table 5, the question "Prefers work that is routine" has an item-total correlation of .175, so it is possible that this question was not measuring the same construct as all of the other items in the scale. Another way to view this relationship is to look at the alpha if the item is deleted. This statistic gives the Cronbach's alpha of the scale if a particular item were to be deleted from the scale. If this question were to be deleted from the scale, the overall alpha for the scale would jump from .774 to .796. This is a very important

observation, and further points out that this question could possibly be removed from the scale to achieve greater internal consistency.

For the purposes of this study, the scale was left as originally constructed with all questions included. The scale has been tested in prior research and is an established measure. Though the scale would benefit from removing the question “Prefers work that is routine,” the added reliability is minimal. Keeping the question in the scale still allowed the measure to fall within the acceptable range.

After all raw personality scores were converted to a POMP score, the individual responses on the openness scale ranged from 30-100 on a zero to 100 scale, with a mean of 70.28. The skewness statistics show that the sample distributions were negatively skewed. This indicates that the majority of the values are to the right of the mean, and the sample curve has a long left tail. The distributions for openness (in addition to all personality factors in the study) had mostly high values, and few low scores on each scale. The kurtosis statistic for openness was negative, which indicated a platykurtic curve. This indicates less extreme values, but values that have a wider spread around the mean.

Conscientiousness. Conscientiousness refers to an individual who is reliable, organized and hardworking. Conscientiousness was measured using a nine item Likert scale.

Table 6

Reliability Analysis of the Conscientiousness Scale

Question	Item-Total Correlation	Alpha If Deleted
Does a thorough job	0.540	0.806
Is a reliable worker	0.490	0.813
Perseveres until the task is finished	0.468	0.810
Does things efficiently	0.527	0.804
Makes plans and follows through with them	0.585	0.799
Can be somewhat careless	0.515	0.807
Tends to be disorganized	0.593	0.796
Tends to be lazy	0.625	0.790
Is easily distracted	0.519	0.806
Cronbach's Alpha = .822		

For the conscientiousness scale, none of the item total correlations fell below the .3 threshold, which is positive and means that none of the items in the scale significantly diverged from the main construct. The alpha would not increase by deleting any of the items from the scale, which means that all items are useful and none should be removed from the scale. The overall alpha of the scale is .822, which is also very good.

Conscientiousness scores ranged from 22.22 to 100 after conversion to a POMP score, with a mean score of 73.28. The skewness statistic indicates that the majority of the values are to the right of the mean, and the sample curve has a long left tail. The distribution had mostly high values, and few low scores. There were no problems with skewness or kurtosis in this scale.

Extraversion. Extraversion refers to someone who is outgoing, assertive, and energetic. In this study, extraversion was measured using an eight item Likert scale.

Table 7

Reliability Analysis of the Extraversion Scale

Question	Item-Total Correlation	Alpha If Deleted
Is talkative	0.679	0.850
Is full of energy	0.497	0.868
Generates a lot of enthusiasm	0.567	0.862
Has an assertive personality	0.519	0.868
Is outgoing, sociable	0.771	0.840
Is reserved	0.580	0.861
Tends to be quiet	0.756	0.840
Is sometimes shy, inhibited	0.654	0.853
Cronbach's Alpha = .871		

Of all of the personality factors, extraversion had the highest alpha at .871. An alpha this high demonstrates great internal consistency of the items in this scale. Further examination of the item-total correlations and alpha if deleted further support the assertion that this scale is highly consistent, measures the same construct, and that no items need be omitted from the scale.

Extraversion scores ranged from 9.38 to 100 and had a mean of 60.1 after conversion to a POMP score. The skewness statistic indicates that the majority of the values are to the right of the mean, and the sample curve has a long left tail. The

distribution has mostly high values, and few low scores. The kurtosis statistic for extraversion is negative, which does not point out any problems of concern.

Agreeableness. Agreeableness refers to one who is caring and attempts to get along well with others. Agreeableness was measured using a nine item scale.

Table 8

Reliability Analysis of the Agreeableness Scale

Question	Item-Total Correlation	Alpha If Deleted
Is helpful and unselfish with others	0.454	0.764
Has a forgiving nature	0.457	0.760
Is generally trusting	0.354	0.778
Is considerate and kind to almost everyone	0.620	0.746
Likes to cooperate with others	0.497	0.758
Tends to find fault with others	0.465	0.762
Starts quarrels with others	0.420	0.768
Can be cold and aloof	0.468	0.763
Is sometimes rude to others	0.530	0.752
Cronbach's Alpha = .782		

The agreeableness scale has a respectable alpha at .782. When examining the item-total correlations in the scale, none of the items fell below the threshold of .3. However, it is interesting to note that one of the questions (Is generally trusting) did have an item-total correlation of .354, which was very low. It is possible that whether or not someone is trusting is not the best measure of agreeableness. To examine this

further, the alpha if deleted may also be examined. Since deleting the alpha does not increase the alpha for the total scale, it is concluded that this question should be left in the scale. While it may have a low correlation with the other items in the scale, this item is not shown to decrease the value of the scale in any way.

After a POMP conversion, agreeableness scores ranged from 19.44 to 100 and had a mean value of 72.75. The skewness statistic is negative, which indicates that the majority of the values are to the right of the mean, and the sample curve has a long left tail. The distribution has mostly high values, and few low scores. The kurtosis statistic for agreeableness is positive, which indicates a leptokurtic curve. The peak is higher around the mean, and there are more values in the tails of the curve. However, neither the skewness nor kurtosis statistics indicate a problem for the scale.

Neuroticism. Neuroticism refers to an individual who is anxious, worries and is prone to experience negative emotions. Neuroticism was measured using an eight item Likert scale.

Table 9

Reliability Analysis of the Neuroticism Scale

Question	Item-Total Correlation	Alpha If Deleted
Is depressed, blue	0.494	0.816
Can be tense	0.470	0.818
Worries a lot	0.644	0.793
Can be moody	0.492	0.815
Gets nervous easily	0.535	0.810
Is relaxed, handles stress well	0.661	0.791
Is emotionally stable, not easily upset	0.610	0.799
Remains calm in tense situations	0.511	0.812
Cronbach's Alpha = .827		

Neuroticism had the second highest alpha of all the personality scores at .827. None of the item-total correlations were below .3, and none of the items had a negative impact on the overall alpha level. Therefore, the scale was included in the study in its original format.

After a POMP conversion, neuroticism scores ranged from 0 to 96.88 and had the lowest mean of 52.95. The skewness statistic indicated that the distribution had mostly higher values, and few low scores. The kurtosis statistic for neuroticism was negative, which indicated there are fewer scores in the tails. These are not problems for the analysis.

Table 10

Descriptive Statistics for Personality Scales and POMP Transformations

	Range	Minimum	Maximum	Mean	Std. Deviation	Variance	Skewness	Kurtosis
Openness	2.80	2.20	5.00	3.811	0.576	0.332	-0.216	-0.448
Conscientiousness	3.11	1.89	5.00	3.930	0.625	0.391	-0.457	-0.310
Extraversion	3.62	1.38	5.00	3.400	0.835	0.696	-0.326	-0.569
Agreeableness	3.22	1.78	5.00	3.910	0.605	0.366	-0.552	0.114
Neuroticism	3.88	1.00	4.88	3.120	0.768	0.590	-0.219	-0.407
Social Desirability	1.00	0.00	1.00	0.520	0.219	0.048	0.098	-0.429
POMP Scores								
Openness	70.00	30.00	100.00	70.2787	14.40729	207.570	-0.216	-0.448
Conscientiousness	77.78	22.22	100.00	73.2787	15.62267	244.068	-0.457	-0.310
Extraversion	90.63	9.38	100.00	60.1127	20.86407	435.309	-0.326	-0.569
Agreeableness	80.56	19.44	100.00	72.7505	15.12665	228.816	-0.552	0.114
Neuroticism	96.88	0.00	96.88	52.9508	19.19702	368.526	-0.219	-0.407

Validity of Constructs

Validity refers to the extent to which we are measuring what we think we are measuring. Validity helps to determine if we can rely on the outcomes of research that has been conducted, and refers to the strength of conclusions to be drawn from the data. In order to assess the construct validity of the personality scales, each of the scales was compared to a validation question. The purpose was to examine the relationship between the operationalization of the concept and the actual concept under study. The validation questions were created to reflect the same constructs that each scale was meant to represent. In other words, does the scale for openness really represent what is meant by the concept of openness? An examination of the zero-order correlations between the scales and the validation questions can provide evidence to support the assertion that each of the scales also has construct validity.

Table 11

Zero-order Correlations of Personality Scales

Personality Scale	Validation Question	Zero-order Correlation
Openness	Tends to have a wide variety of interests	.456**
Conscientiousness	Tends to be organized and responsible	.689**
Extraversion	Tends to be active and energetic	.567**
Agreeableness	Tends to be generous and sympathetic	.644**
Neuroticism	Tends to experience negative emotions	.659**

** Correlation is significant at the .01 level

Based on the definitions of each overall personality factor, questions to reflect each factor were created. If each of the scales is measuring the correct construct, it should then follow that each scale would be significantly and positively correlated with the corresponding validation question. As was expected, all of the zero order correlations were positive and significant at the $p < .01$ level.

The five personality factors used in this study are broad domains that actually consist of numerous facets. It is possible that the validation questions do not adequately address all facets. For example, openness refers to someone who participates in and enjoys a wide variety of interests, is open to new experiences, and is engaged in the arts and music. Extraversion refers to someone who is active and energetic, but also someone who is talkative and outgoing. This broad range of each factor may account for the weak correlations, but does not necessarily suggest a problem with the measure.

Consensual validity can be obtained by ensuring that a set of experts all agree that the measures are valid. In this situation, the BFI was created by experts in

personality research. As mentioned in the previous chapter, the BFI has been compared to other personality scales, and has been found to be valid in prior research.

Social desirability. To be sure that the results for the personality scales were not due to social desirability bias, a social desirability scale was also examined. Note that this survey was conducted online and was anonymous, so social desirability should not be a salient concern in the current study. However, this variable was still measured so that its impact could be assessed.

The social desirability scale was first examined to determine its degree of internal consistency. Social desirability was measured using a ten item scale to which respondents answered either true or false. Giving the socially desirable response is worth one point. For each participant, all points for the scale were added together. As seen in a study by Cheek (2007), the sum score for each individual was then divided by ten (the total number of questions in the scale). This results in scores that range from zero to one, which is a more intuitive measure. Zero denoted no social desirability at all, and one denoted perfect, or complete social desirability.

Table 12

Reliability Analysis of the Social Desirability Scale

Question	Item-Total Correlation	Alpha If Deleted
I never hesitate to go out of my way to help someone in trouble	.245	.623
I have never intensely disliked anyone	.321	.607
When I don't know something I don't at all mind admitting it	.148	.642
I am always courteous, even to people who are disagreeable	.317	.608
I would never think of letting someone else be punished for my wrongdoings	.291	.616
I sometimes feel resentful when I don't get my way	.398	.589
There have been times when I felt like rebelling against people in authority even though I knew they were right	.297	.613
I can remember "playing sick" to get out of something	.300	.611
There have been times when I was quite jealous of the good fortune of others	.314	.608
I am sometimes irritated by people who ask favors of me	.397	.588
Cronbach's Alpha = .636		

As a general rule, an acceptable alpha level is .70 or higher. For this scale, the alpha is lower at .636. According to DeVellis (1991), this is an undesirable alpha level. To further help determine if this is a cause for concern, it makes sense to look at the item-total correlations for the scale. If any of the item-total correlations are lower than .3, there may be a problem and the items in the scale do not correlate well with the overall scale. For social desirability, four of the items in the scale are lower than .3, and all of the items above this point are still very close to .3. When looking at the question "When I don't know something I don't at all mind admitting it," the alpha for the scale

would actually be higher if this item were excluded from the scale and jump to an alpha of .642. However, even if this item were excluded from the scale, it still would not cause the alpha to move towards reaching the minimum level of acceptability of .70 for a scale alpha. This further points out some key problems with the scale and illustrates that all of the items in the scale are not very highly correlated.

In this study, social desirability scores served as a comparison tool. The scores allowed the researcher to detect whether respondents were answering questions in a manner that presented them in a bad light, or perhaps and untrue or exaggerated observation. As a stand alone measure, the social desirability scale does not reach the cutoff for acceptability to be considered valid. However, this construct is not a main variable in the current research and is only included to test the validity of the Five Factor Model. However, all findings will be viewed cautiously in light of the low alpha of the scale. The mean score for this scale was .52, which is directly in the middle of the scale with a range of zero to one.

Correlations between social desirability and personality factors ranged between .050 for openness and .499 for agreeableness. The reason for such a high correlation between social desirability and agreeableness could be due to the fact that an individual who is considered to be agreeable likes to get along with others, is cooperative, and is more likely to exhibit socially desirable behaviors. The same can be argued for conscientiousness (.330). One who is more conscientious and hardworking may also be more likely to exhibit more socially desirable behaviors. However, since the social desirability scale does not reach the cutoff level of .70 for an acceptable measure, findings based on this measure may not be reliable.

Table 13

Correlations between Social Desirability and Personality Factors

	Social Desirability
Openness	0.050
Conscientiousness	0.330**
Extraversion	0.106
Agreeableness	0.499**
Neuroticism	-0.223**

Offending. Offending was divided into six types of offending categories. The offense types indexes were developed to follow the typology of Glaser (1967). The offense categories consisted of offenses against people, property offenses, analogous offenses, public disorder offenses, illegal service offenses and drug use. The index covers all but one of the Uniform Crime Report Part I offenses (homicide is left out) and 60% of Part II offenses.

Offense types (property, persons, public disorder, etc.) measured the number of times respondents reported involvement in each kind of offense. The minimum number of reported incidents for each offense type was zero. Initially, the range of raw scores for each offense was too broad for meaningful analysis. To address this problem, an index was created for each offense type. An index is created from the accumulation of scores from several questions. Questions may not be highly correlated with each other, but together the questions may all serve to shed light on the same construct. Each act within a specific offense type was recoded as zero if the individual had never committed the offense, and one if any level of involvement was reported. This allowed for an index that could more accurately measure the amount of involvement in a particular offense. The resulting indexes will be discussed in more detail in subsequent sections.

Offenses against persons. Offending against persons had a clearly chosen victim where a person was assaulted. The scale consisted of six questions and referred to violent crimes such as attacking, hitting or using force against someone. The six questions allowed for an index score with a range from zero if there was no involvement in offenses against persons, to six for involvement in each act. In the actual sample, scores ranged from zero to three with a mean of .1836. Only 14% of the sample reported involvement in offenses against persons.

Property offenses. Property offenses had a clearly chosen victim where property was taken or damaged. The index for property offenses consisted of 12 questions and referred to offenses such as vandalism and theft. Property offenses had a maximum index score of 12, with an actual range of zero to six for the sample. The sample mean was .5803 offenses. Thirty percent of the sample reported involvement in property offenses at some point during the 12 month period under study.

Analogous offenses. Analogous offenses are offenses that are deviant only due to the age or status of an individual. Since this survey addressed college students, questions about cheating, or lying about age to receive goods or services were asked. Analogous offenses had a score range from zero to three with a mean of .5836 offenses. Forty-two percent of the sample reported involvement in analogous offenses at some point during the study period.

Public disorder offenses. The next category is public disorder offenses which are offenses that lack a specific victim, yet are considered crimes or become problems when others are offended or likely to be offended. The index was comprised of three items dealing with public drunkenness, disorderly conduct and vagrancy. Public

disorder offenses had a score range of zero to three, with a mean of .4164 incidents and 32% of the sample reported some level of involvement.

Illegal service offenses. Illegal service offenses refer to offenses that are often seen as “victimless” but involve a business relationship between two parties. The four item index asked about behaviors such as prostitution and drug dealing. The index had a maximum range of four, and an actual range of two in the sample. The sample mean for illegal service offenses was .0885. Fifteen percent of the sample reported engagement in illegal service offenses.

Drug use. The nine item index for substance use asks about the frequency of drug use, with drugs included such as alcohol, marijuana, cocaine, and prescription drugs. Substance use had a maximum range of scores from zero to nine with an actual range of zero to six. The mean in the sample was just under one incident at .8656. Substance use also had the highest percentage of participation at 52%.

Overall offending. Offending was measured by adding together the total index scores for all of the various offense types reported for each participant. The possible scores for offending ranged from zero to thirty seven. The actual range of scores within the sample ranged from zero to nineteen. The mean number of offenses for individuals in the sample was almost three offenses (2.7180).

Table 14

Descriptive Statistics of Offending Variables

	N	Range	Minimum	Maximum	Mean	Std. Deviation	Variance	Skewness	Kurtosis
Property	305	6.00	.00	6.00	0.58	1.15	1.32	2.53	6.80
Persons	305	3.00	.00	3.00	0.18	0.50	0.25	3.05	9.86
Illegal Service	305	2.00	.00	2.00	0.09	0.34	0.11	4.10	17.29
Public Disorder	305	2.00	.00	2.00	0.42	0.66	0.43	1.32	0.46
Analogous	305	3.00	.00	3.00	0.58	0.79	0.63	1.21	0.68
Drug Use	305	6.00	.00	6.00	0.87	1.18	1.39	2.09	5.26
Offending	305	19.00	.00	19.00	2.72	3.39	11.53	1.85	4.12

Note that the offending variables did have a few issues with the skewness and kurtosis values. However, these values are not considered salient problems in this study. Skewness and kurtosis values may be higher with a smaller sample size and may decrease with a larger sample. Remember that while the skew or kurtosis may reflect extreme scores in the sample, it is also likely that the total population would also suffer from the same problems. For example, illegal service offenses have the highest scores on both statistics in Table 14. While the possible range for offenses was zero to two, the actual mean was almost zero at 0.09. This suggests that the majority of scores on this variable were zero, and the few individuals who did participate in these acts were the exceptions rather than the norm.

Co-offending. Co-offending is defined as “the act of committing crime alongside one or more accomplices” (van Mastrigt & Farrington, 2009). Co-offending was measured using one follow up question for every offending question on the survey.

Participants were asked how often they usually commit each offense with others. The answer choices ranged from never to always on a five point Likert scale. Since the current research was concerned with whether or not co-offending occurs rather than counting the number of incidents of co-offending, this measure was adequate to obtain the required information.

When looking at the scores on the measure, responses only fell into three of the possible five categories. Almost 12% of the sample reported never co-offending, almost 87% reported rarely co-offending, and just over 1% reported some co-offending. There were no responses to show that any individuals in the sample often or always engaged in co-offending. Due to this lack of variation that existed in the responses for this variable, it was collapsed into a dichotomous measure. The two remaining categories consisted of individuals who did not report any co-offending (never) and individuals who did co-offend at some point (rarely and sometimes).

Co-offending was also broken down to measure co-offending for various types of offenses. The same offense categories that were used to measure offending were also applied to co-offending. Co-offending was divided to measure participation in acts with peers during property co-offenses, co-offenses against people, illegal service co-offenses, public disorder co-offenses, analogous co-offenses and co-offenses involving substance use.

For co-offending data, individuals who did not report any involvement in the act at all were removed from the analysis. If an individual did not offend, there was no way to measure co-offending. This adjustment in the data resulted in very low sample sizes by offense type. For example, in table 15, the variable co-offenses against persons was

only comprised of responses from 43 individuals from the total sample of 305. Overall, co-offending had the highest sample size at 199 individuals.

The possible range of scores on the dichotomous measure for co-offending was zero for no involvement in co-offending (which would also denote solo offenders) and one for any amount of co-offending. The mean scores by offense type ranged from .80 at the low end for analogous offenses and .98 at the upper limit for drug use. Scores this high mean that the majority of respondents in this analysis were co-offenders with a very small proportion of solo offenders.

Table 15

Descriptive Statistics of Co-offending Variables

	N	Range	Minimum	Maximum	Mean	Std. Deviation	Variance	Skewness	Kurtosis
Property	91	1.00	.00	1.00	0.85	.36	.13	-1.95	1.85
Persons	43	1.00	.00	1.00	0.86	.35	.12	-2.16	2.78
Illegal Service	45	1.00	.00	1.00	0.91	.29	.08	-2.99	7.26
Public Disorder	98	1.00	.00	1.00	0.98	.14	.20	-6.89	46.41
Analogous	128	1.00	.00	1.00	0.80	.40	.16	-1.49	0.23
Drug Use	160	1.00	.00	1.00	0.98	.13	.02	-7.16	49.93
Co-offending	199	1.00	.00	1.00	0.85	.36	.12	-1.97	1.89

In Table 15, it is again noted that there are concerns with skewness and kurtosis. The negative skew shows that there are mostly higher scores on the variables, and higher kurtosis scores can depict more extreme scores. This is obvious when looking at the mean for each of the variables in the table. The mean scores are closer to the maximum value. The importance of these numbers is that there is little variation in the

variables on co-offending and very few solo offenders are included in the variables. It is important to assess the impact of these values when running regressions.

Table 16 provides a descriptive summary of solo and co-offenders to give a true picture of the data. However, it is important to note that all data may not add up to equal numbers due to missing information in the dataset. Some respondents did not answer specific questions about sex, race or age. While this was true in only a couple of cases, it may become more apparent in the table.

Table 16

Descriptive Summary of Solo and Co-offenders by Type of Co-offending

	Sex		Race		Age	
	Male	Female	White	Non-White	18-22	23+
Property						
Solo Offenders	4	10	14	0	9	5
Co-offenders	33	44	69	7	53	24
Persons						
Solo Offenders	1	5	6	0	5	1
Co-offenders	20	17	31	6	28	9
Illegal Service						
Solo Offenders	2	2	4	0	3	1
Co-offenders	17	24	39	1	26	15
Public Disorder						
Solo Offenders	1	1	2	0	1	1
Co-offenders	42	54	92	3	57	41
Analogous						
Solo Offenders	11	15	24	2	18	8
Co-offenders	44	58	90	12	79	23
Drug Use						
Solo Offenders	1	2	2	1	2	1
Co-offenders	53	104	143	13	9	64
Co-offending						
Solo Offenders	9	21	26	4	12	18
Co-offenders	60	109	153	15	116	53

Validity of the offending and co-offending variables is best examined through face validity. Face validity asks the question, “Does the measure make sense? Does it appear to measure the concept that it is supposed to measure?” For offending and co-offending types, the offenses were separated to meet the definition of each category. In addition, the total offending and co-offending variables were simply the aggregate of the different types, so these measures also have face validity.

Correlations

Correlations account for the association between two variables. This association can show the direction of an association (positive or negative) to explain whether one variable increases or decreases as another variable changes. These correlations will allow a general picture of the possible relationships between variables included in the correlation matrix. Correlations do not account for the possibility of rival causal factors. Therefore, despite the relationships noted in the correlation matrix, it is still possible that there are other factors that impact upon the observed relationships. These factors have not been controlled for in the correlation computations. The correlations presented here consist of all the variables used in the models for this research.

Table 17

Bivariate Regression

Independent Variables	Dependent Variables							
	Offending	Property	Persons	Analogous	Illegal Service	Public Disorder	Drug	Co-offending
Age	-0.139*	-0.112	-0.116*	-0.222**	-0.046	-0.027	-0.076	-0.115*
Race	-0.061	-0.046	0.060	0.043	-0.052	-0.136*	-0.096	-0.050
Sex	-0.206**	-0.171**	-0.163**	-0.138*	-0.169**	-0.174**	-0.119*	-0.067
Openness	0.011	-0.003	0.024	-0.079	0.110	-0.036	0.063	-0.021
Conscientiousness	-0.246**	-0.219**	-0.086	-0.212**	-0.153**	-0.098	-0.222**	-0.138*
Extraversion	-0.025	-0.057	0.056	-0.065	-0.043	0.046	-0.018	-0.068
Agreeableness	-0.164**	-0.194**	-0.025	-0.072	-0.113*	-0.085	-0.141*	-0.118*
Neuroticism	-0.012	0.041	-0.061	-0.070	0.071	-0.022	-0.017	0.088

Table 18

Correlations Among Independent Variables

Independent Variables	Independent Variables							
	Age	Race	Sex	Openness	Conscientiousness	Extraversion	Agreeableness	Neuroticism
Age	1							
Race	-0.048	1						
Sex	-0.054	0.037	1					
Openness	0.130*	-0.012	-0.09	1				
Conscientiousness	0.209**	0.006	0.202**	0.207**	1			
Extraversion	0.084	0.016	0.056	0.201**	0.221**	1		
Agreeableness	0.161**	-0.039	0.191**	0.128*	0.310**	0.222**	1	
Neuroticism	-0.101	-0.063	0.192**	-0.032	-0.208**	-0.256**	-0.229**	1

When examining the correlations that exist between Independent variables, all of the correlations were low and suggested that multicollinearity was not a salient concern in this study. In addition to the bivariate correlations, the tolerance and variance inflation factors (VIF) also tested for multicollinearity among the independent variables.

When looking at the correlations for this study, a few significant relationships emerged among the control variables. Sex was significantly and negatively related to every type of offense in the study except for co-offending. Since sex was coded as 0=male and 1=female, the correlations show that higher incidents of offending are significantly associated with being male.

Race was only found to be significantly associated with public disorder offenses. The relationship was also negative, which suggests that nonwhites are less likely to be involved in public disorder offenses than whites.

Age was significantly and negatively related to the analogous offending, overall offending and co-offending variables. These results suggest that older individuals are less likely to commit analogous offenses, offend in general or co-offend than younger individuals.

For the personality variables, openness, extraversion and neuroticism were not significantly correlated with any of the dependent variables in the models. Despite this fact, conscientiousness and agreeableness were significantly correlated with a few types of offending. Conscientiousness was significantly and negatively correlated with every type of offending except public disorder offenses. Individuals with higher scores on the conscientiousness scale are less likely to be involved in these activities. Agreeableness had very similar results and was significantly and negatively correlated with every type of offending except public disorder offenses and analogous offenses. As with conscientiousness, individuals with higher scores on these variables are less likely to be involved in these activities.

Phase Two

In this study, results from an online survey were collected from 305 university students. The sample was comprised of 32.8% male students and 67.2% female students. Approximately 90% of the sample was white, and the ages ranged from 18 to 59 years of age.

Information from this sample was used to examine the key research questions and hypotheses in this study. Five hypotheses discussed the issues of personality factors and offending, and five hypotheses dealt with the relationship between personality factors and co-offending. The final aspect of the study is to examine whether personality factors can help to determine whether an individual resists offending, offends alone, or offends with others. In order to find the answers to all of the proposed research questions, ordinary least squares regression (OLS), binomial logistic regression, analysis of variance (ANOVA), and multinomial logistic regression will be used.

The first step in explaining each test is to explain the regression assumptions and then the test results will be presented. The results will be reviewed in light of the different research questions and hypotheses included in the study. Assumptions will be discussed, each hypothesis will be explained, data will be presented, and conclusions will be drawn.

According to Lewis-Beck (1980), there are several assumptions that must be addressed in the statistical analysis of this study. The relevant assumptions for all analyses are as follows:

1. No specification error
 - a. No relevant independent variables have been excluded
 - b. No irrelevant independent variables have been included
2. No measurement error
 - a. The variables X_i and Y_i are accurately measured
3. Assumptions concerning the error term
 - a. Zero mean
 - b. The independent variable is uncorrelated with the error term

Number one addresses specification error. To avoid specification error is to suggest that the correct theoretical model is included in the equation. The model should have all necessary variables included in the model, with no unnecessary variables included. To check this assumption, it is useful to look at the R^2 value.

Measurement error is most important in reference to the independent variables. If the measures used in the models are inaccurate, then any resulting findings may also be inaccurate and unreliable. In this study, the measures for all variables are widely used and accepted in the field. However, the reliability analyses previously conducted ensures proper variable measurement.

Lewis-Beck (1980) points out that the assumption of a zero mean does not have the same level of importance in social science research as many of the other

assumptions. If the mean does not equal zero, it can lead to a biased estimate of the intercept. To test this assumption, the residuals will be examined. While there were problems noted in the residual plots, this is to be expected given the issues discussed earlier (and referenced in tables 14 and 15) with the variables. Despite the plots, the means of the residuals for all models was equal to zero. It is important to acknowledge this violation and the possible bias, but the models were not changed as a result of this finding.

Offending

To examine all relevant hypotheses for this study, hypotheses for offending will be discussed, followed by hypotheses for co-offending. The models in this section test the hypotheses that personality factors have a significant relationship with offending.

The hypotheses are as follows:

Ha1: There is a significant, positive relationship between openness and offending.

Ha2: There is a significant, negative relationship between conscientiousness and offending.

Ha3: There is a significant, positive relationship between extraversion and offending.

Ha4: There is a significant, negative relationship between agreeableness and offending.

Ha5: There is a significant, positive relationship between neuroticism and offending.

Ordinary least squares regression was used to statistically test these relationships. The variables included in the model were the five personality factors, in addition to age, sex, and race. To further test the models and ensure the best possible model specification, backward elimination was used. Each regression analysis began with all variables in the model. OLS regression was run using all variables and the results were analyzed for significance. The variable that had the largest p-value was eliminated from the model by the researcher. Then an entirely new model was run, including all but the previously excluded variable. P-values were then reassessed for significance. The variable with the largest p-value was omitted from the model, and a new model was once again constructed. The new model included all variables except the two excluded variables. This process was continued until the best possible model was obtained. The best possible model was found when backward elimination no longer yielded any additional significant variables, and just before elimination adversely impacted the R^2 value.

Offenses Against Persons

Various types of offenses were examined in an effort to test the hypotheses that personality factors have a significant relationship with offending. The first model examines offenses against persons. Offending against persons examines acts such as assault and use of force. The index score for this variable was used in the analysis for this model. The control variables for this model are age, sex and race. Age is an individual's reported chronological age in years. Sex is coded as 0 = male and 1 = female. Race was condensed into a dichotomous measure with 0 = white and 1 = nonwhite.

At the bivariate level, none of the personality factors were found to be correlated with offending against persons. For a multivariate analysis, all five personality factors and the control variables (age, race and sex) were included in a model to test the impact of the independent variables on offending against persons. In the OLS regression model, not one personality factor was shown to be significantly related to offenses against persons.

Table 19

OLS Regression Results Measuring the Impact of the Five Factor Model on Offending Against Persons

Independent Variables	B	Beta	T	95% CI	Tolerance	VIF
Constant	.427		1.727	[-0.059, 0.913]		
Age	-.007	-.126	-2.140*	[-0.014, -0.001]	.925	1.081
Sex	-.174	-.163	-2.621**	[-0.305, -0.043]	.830	1.204
Race	.097	.057	1.003	[-0.094, 0.288]	.987	1.013
Openness	.001	.022	0.360	[-0.003, 0.005]	.901	1.110
Conscientiousness	-.002	-.057	-0.890	[-0.006, 0.002]	.788	1.269
Extraversion	.002	.075	1.230	[-0.001, 0.005]	.865	1.156
Agreeableness	.001	.024	0.386	[-0.003, 0.005]	.815	1.226
Neuroticism	-.001	-.028	-0.441	[-0.004, 0.003]	.809	1.236

R² = .056, Durbin Watson = 1.807, F = 2.164*
 *p<.05, **p<.01, ***p<.001

The R² for the model shows the proportion of the variation in the dependent variable that is explained by the independent variables. In this model for offending, the independent variable explains .056 or 5.6% of the variation in the dependent variable offending. In addition, prediction error can be reduced by 5.6% by using the regression equation versus using the mean of the dependent variable. The R² addresses the assumption of specification error. Looking at the R² can help determine if all the relevant

independent variables are included. Approximately 94.4% of the variance is still unexplained, therefore it is clear that relevant variables are still missing from the model.

The F tests the null hypothesis that all slopes are equal to zero and that $R^2=0$. Since the F score is significant ($p<.05$), we reject the null hypothesis. We conclude that at least one of the slopes is not equal to zero.

The variance inflation factor (VIF) and tolerance statistics both test for multicollinearity between the independent variables. If the tolerance score is less than .25 (or even closer to zero), then multicollinearity is a problem within the model. The closer the score is to one, it is less likely that this is a concern. In this model, all scores are close to one, so multicollinearity is not a salient issue. When looking at the VIF, the closer the score is to 4, it is more likely that a problem exists with multicollinearity. The closer the score is to one, it is less likely that this is a problem. All the VIF scores in the model are close to one, therefore this is not a problem for this model.

Casewise diagnostics examines the assumption of normally distributed error terms. Table 20, helps to identify outliers within 3 standard deviation units. These are higher offenders from whom the model is not a good predictor. In a normal distribution, 5% of the error terms are in the tails with 2.5% on either side. The acceptable 5% would be 15 cases in this model. For this model, eleven cases are beyond 3 standard deviation units. In an examination of the residual statistics, the error term has a mean of zero, therefore, this assumption is satisfied.

Table 20

Casewise Diagnostics for Offending Against Persons

Case Number	Std. Residual	PersonsBinScale	Predicted Value	Residual
150	3.814	2.00	.1173	1.88269
186	3.477	2.00	.2837	1.71626
231	3.447	2.00	.2982	1.70179
246	3.476	2.00	.2842	1.71580
256	5.352	3.00	.3581	2.64191
267	3.193	2.00	.4239	1.57605
289	5.482	3.00	.2939	2.70605
292	3.685	2.00	.1809	1.81907
298	3.316	2.00	.3632	1.63683
302	3.223	2.00	.4092	1.59084
305	3.443	2.00	.3005	1.69953

The Beta scores standardize the slopes and convert them into a z score. This allows comparisons to be made even though the variables are not all coded in the same way. We can also compare the strengths of the slopes and determine which independent variables have the most impact on the dependent variable. In this model, sex (-.163) seems to have the greatest impact on offending against persons. Since the beta is negative, individuals with higher scores on sex (females) are less likely to engage in offending. The variable with next highest beta score is age (-.126). The negative beta suggests that older individuals are also less likely to commit offenses against persons.

The t test for the slopes tests the null that a particular slope is equal to zero. This would mean that there is no relationship between the independent variable and the dependent variable. In this model, the only significant independent variables for a one tailed test are sex ($p < .01$) and age ($p < .05$). For both variables we reject the null and conclude that the slopes are significantly different from zero. For all of the other

variables in the model, we fail to reject the null and conclude that the slopes are not significantly different from zero.

Backward elimination was attempted with this model. However, despite the removal of other independent variables, the results stayed the same. Age and sex were still the only significant variables, and they were both still significant at the same level. In addition, the removal of additional variables resulted in a decrease in the R^2 value. This suggests that the original regression model is the best model for these variables and does not need to be altered.

Property Offenses

In a test of the relationship between the independent variables and property offenses (table 21), the R^2 in the initial model shows that the independent variables along with the control variables explain .089 or 8.9% of the variation in the dependent variable property offending. Since the F score is significant at $p < .01$, we conclude that all of the slopes are not equal to zero. In this model, conscientiousness is significant at the $p < .05$ level for a one tailed test. Since the relationship is negative, these results suggest that individuals with higher scores on conscientiousness are less likely to engage in property offenses.

Table 21

OLS Regression Results Measuring the Impact of the FFM on Property Offending

Independent Variables	B	Beta	T	95% CI	Tolerance	VIF
Constant	2.295		4.126	[1.200, 3.390]		
Age	-.010	-.073	-1.259	[-0.025, 0.006]	.925	1.081
Sex	-.290	-.119	-1.937	[-0.584, 0.005]	.830	1.204
Race	-.194	-.050	-0.886	[-0.624, 0.237]	.987	1.013
Openness	.003	.041	0.701	[-0.006, 0.013]	.901	1.110
Conscientiousness	-.011	-.151	-2.399*	[-0.020, -0.002]	.788	1.269
Extraversion	.001	.010	0.161	[-.006, 0.007]	.865	1.156
Agreeableness	-.010	-.128	-2.071	[-0.019, 0.000]	.815	1.226
Neuroticism	.000	-.003	-0.056	[-0.007, 0.007]	.809	1.236

R² = .089, Durbin Watson = 1.550, F =3.576**
 *p<.05, **p<.01, ***p<.001

Backward elimination was attempted with this model. However, despite the removal of other independent variables, the results stayed the same.

Conscientiousness was still the only significant variables, and it was still significant at the same level. In addition, the removal of additional variables resulted in a decrease in the R² value. This suggests that the original regression model is the best model for these variables and does not need to be altered.

Analogous Offenses

When looking at the relationship between personality and analogous offenses, the R² shows that the independent variables along with the control variables explain .105 or 10.5% of the variation in the dependent variable. Since the F score is significant (p<.001), we conclude that all of the slopes are not equal to zero. In this model, one of the independent variables is significant. Conscientiousness (p<.05) is significantly and

negatively related to analogous offending. This means that those with higher scores on the conscientiousness are less likely to commit analogous offenses.

Table 22

OLS Regression Results Measuring the Impact of the FFM on Analogous Offending

Independent Variables	B	Beta	T	95% CI	Tolerance	VIF
Constant	2.086		5.488	[1.338, 2.835]		
Age	-.019	-.203	-3.525	[-0.029, -0.008]	.926	1.080
Sex	-.170	-.101	-1.662	[-0.371, 0.031]	.829	1.206
Race	.082	.030	0.548	[-0.212, 0.376]	.990	1.010
Openness	-.001	-.026	-0.451	[-0.008, 0.005]	.902	1.109
Conscientiousness	-.008	-.161	-2.592*	[-0.014, -0.002]	.787	1.270
Extraversion	-.001	-.030	-0.501	[-0.006, 0.003]	.864	1.157
Agreeableness	.001	.020	0.329	[-0.005, 0.007]	.815	1.227
Neuroticism	-.005	-.111	-1.809	[-0.010, 0.000]	.808	1.237

$R^2 = .105$, Durbin Watson = 1.396, $F = 4.294^{***}$
 * $p < .05$, ** $p < .01$, *** $p < .001$

For this model, backward elimination lead to a change in the significant variables in the model. Variables with the highest p values were removed one at a time and the new models were then examined. After the elimination of agreeableness, openness and race, new results emerged. Age ($p < .001$) and conscientiousness ($p < .01$) were both significantly and negatively related to analogous offending. This would suggest that older individuals are also more likely to be involved in analogous offenses.

Table 23

OLS Regression Results Measuring the Impact of the FFM on Analogous Offending After Backward Elimination

Independent Variables	B	Beta	T	95% CI	Tolerance	VIF
Constant	2.092		6.812	[1.488, 2.697]		
Age	-.019	-.202	-3.578***	[-0.029, -0.008]	.944	1.059
Sex	-.157	-.093	-1.595	[-0.350, 0.037]	.887	1.127
Conscientiousness	-.008	-.164	-2.733**	[-0.014, -0.002]	.839	1.191
Extraversion	-.001	-.033	-0.569	[-0.006, 0.003]	.902	1.108
Neuroticism	-.005	-.119	-1.997	[-0.010, 0.000]	.853	1.172

R² = .103, Durbin Watson = 1.424, F = 6.827***
 *p<.05, **p<.01, ***p<.001

Public Disorder Offenses

In this model, the R² shows that the independent variables along with the control variables explain .065 or 6.5% of the variation in the dependent variable public disorder offending. Since the F score is significant (p<.05), we conclude that all of the slopes are not equal to zero. The OLS regression results support the findings from the bivariate correlations. Sex (-.162) seems to have the greatest impact on offending and race (-.138) has the next largest beta. Since the betas are negative, females are less likely to engage in public disorder offending than males and nonwhites are less likely to be involved in public disorder offending than whites. For sex (p<.01) and race (p<.05) we reject the null and conclude that the slopes are significantly different from zero. For all of the other variables in the model, we fail to reject the null and conclude that the slopes are not significantly different from zero.

Table 24

OLS Regression Results Measuring the Impact of the FFM on Public Disorder Offending

Independent Variables	B	Beta	T	95% CI	Tolerance	VIF
Constant	.670		2.985	[0.330, 1.605]		
Age	-.002	-.023	-0.397	[-0.01, 0.007]	.925	1.081
Sex	-.228	-.162	-2.613**	[-0.399, -0.056]	.830	1.204
Race	-.308	-.138	-2.421*	[-0.559, -0.058]	.987	1.013
Openness	-.002	-.049	-0.819	[-0.008, 0.003]	.901	1.110
Conscientiousness	-.002	-.050	-0.782	[-0.007, 0.003]	.788	1.269
Extraversion	.003	.096	1.577	[-0.001, 0.007]	.865	1.156
Agreeableness	-.003	-.058	-0.933	[-0.008, 0.003]	.815	1.226
Neuroticism	.000	-.005	-0.081	[-0.004, 0.004]	.809	1.236

$R^2 = .065$, Durbin Watson = .858, $F = 2.547^*$
 * $p < .05$, ** $p < .01$, *** $p < .001$

Backward elimination was also attempted with this model. However, reducing the model did not result in any other significant variables, and actually lowers the R squared value. Since there was no advantage to reducing the model, the initial model is included in the final analysis.

Illegal Service Offenses

In this model, the R^2 shows that the independent variables along with the control variables explain .069 or 6.9% of the variation in the dependent variable illegal service offending. Since the F score is significant, we conclude that all of the slopes are not equal to zero. In this model, only one of the independent variables is significant. Openness ($p < .05$) is significantly and positively associated with illegal service offending. These results show that individuals with higher openness scores are more likely to be involved in this type of offending.

Table 25

OLS Regression Results Measuring the Impact of the FFM on Illegal Service Offending

Independent Variables	B	Beta	T	95% CI	Tolerance	VIF
Constant	.183		1.105	[-0.143, 0.510]		
Age	-.001	-.035	-0.603	[-0.006, 0.003]	.925	1.081
Sex	-.098	-.136	-2.201	[-0.186, -0.010]	.830	1.204
Race	-.052	-.045	-0.796	[-0.180, 0.076]	.987	1.013
Openness	.003	.137	2.302*	[0.000, 0.006]	.901	1.110
Conscientiousness	-.003	-.116	-1.821	[-0.005, 0.000]	.788	1.269
Extraversion	-9.988E-5	-.006	-0.102	[-0.002, 0.002]	.865	1.156
Agreeableness	-.001	-.048	-0.776	[-0.004, 0.002]	.815	1.226
Neuroticism	.001	.057	0.907	[-0.001, 0.003]	.809	1.236

R² = .069, Durbin Watson = 1.392, F = 2.735**
 *p<.05, **p<.01, ***p<.001

Backward elimination was attempted with this model as well. However, reducing the model did not result in any other significant variables, and actually lowers the R squared value. Since there was no advantage to reducing the model, the initial model is included in the final analysis.

Drug Use

In the model for drug use, the R² shows that the independent variable along with the control variables explain .090 or 9.0% of the variation in the dependent variable. Since the F score is significant (p<.01), we conclude that all of the slopes are not equal to zero. Conscientiousness (-.214) seems to have the greatest impact on offending. Since the beta is negative, this suggests that individuals with higher conscientiousness scores are less likely to engage in drug use. The variable with the next highest beta

weight is openness (.115). The positive value suggests that individuals with higher scores on openness are more likely to engage in drug use.

Despite the betas, only one of the independent variables is significant in the model. For conscientiousness ($p < .01$) we reject the null and conclude that the slope is significantly different from zero. Openness (.054) very closely approaches significance in this model, though it does not meet the customary cutoff of $p < .05$. For all of the other variables in the model, we fail to reject the null and conclude that the slopes are not significantly different from zero.

Table 26

OLS Regression Results Measuring the Impact of the FFM on Drug Offending

Independent Variables	Slope	Beta	T	95% CI	Tolerance	VIF
Constant	2.450		4.216	[1.306, 3.593]		
Age	-.006	-.040	-0.677	[-0.022, 0.011]	.927	1.079
Sex	-.086	-.034	-0.550	[-0.393, 0.222]	.834	1.199
Race	-.418	-.103	-1.824	[-0.869, 0.033]	.990	1.010
Openness	.009	.115	1.933	[0.000, 0.019]	.905	1.105
Conscientiousness	-.016	-.214	-3.372**	[-0.026, -0.007]	.793	1.261
Extraversion	.001	.015	0.244	[-0.006, 0.008]	.865	1.157
Agreeableness	-.008	-.108	-1.738	[-0.018, 0.001]	.820	1.220
Neuroticism	-.005	-.082	-1.309	[-0.013, 0.003]	.811	1.233

$R^2 = .090$, Durbin Watson = 1.170, $F = 3.515^{**}$
 $*p < .05$, $**p < .01$, $***p < .001$

After backward elimination was attempted, no changes were noted. The direction of the relationships was the same as previously reported, so the original models will be used in the final analysis.

Offending

The dependent variable in the final OLS model is offending. Offending in the current study is a general measure of all offending, regardless of the type of offense. The total value of the index scores for all offense types were used in the analysis for this model. The R^2 shows that the independent variables along with the control variables explain .113 or 11.3% of the variation in the dependent variable offending. Since the F score is significant, we conclude that all of the slopes are not equal to zero. Sex ($p < .05$) and conscientiousness ($p < .01$) were both found to have significant, negative relationships with offending which further supports the findings in the bivariate correlations. These negative relationships mean that males and individuals with lower scores on the conscientiousness scale are more likely to offend.

Table 27

OLS Regression Results Measuring the Impact of the FFM on Offending

Independent Variables	Slope	Beta	T	95% CI	Tolerance	VIF
Constant	8.330		5.131	[5.135, 11.525]		
Age	-.044	-.109	-1.907	[-0.088, 0.001]	.925	1.081
Sex	-1.056	-.146	-2.420*	[-1.915, -0.197]	.830	1.204
Race	-.785	-.068	-1.230	[-2.040, 0.471]	.987	1.013
Openness	.013	.050	0.945	[-0.014, 0.040]	.901	1.110
Conscientiousness	-.042	-.192	-3.093**	[-0.068, -0.015]	.788	1.269
Extraversion	.006	.035	0.596	[-0.013, 0.025]	.865	1.156
Agreeableness	-.020	-.091	-1.490	[-0.047, 0.007]	.815	1.226
Neuroticism	.009	-.052	-0.851	[-0.00, 0.012]	.809	1.236

$R^2 = .113$, Durbin Watson = .848, $F = 4.665^{***}$
 * $p < .05$, ** $p < .01$, *** $p < .001$

Backward elimination was also attempted for this model. However, the removal of variables did not result in any additional significant findings. Instead, the removal of

additional variables caused a reduction in the R squared value. For this reason, the initial model is the most appropriate model to explain the relationship.

Summary

The OLS regression of personality factors and offending had interesting results. All of the control variables were found to have significant relationships. Sex had the most significant relationships and was significantly and negatively related to offenses against persons, public disorder offenses and general offending. This means that women are significantly less likely to be involved in these behaviors. Age was negatively related to both analogous offenses and offenses against persons, which means that younger individuals were more likely to be engaged in both types of offending. Finally, race was negatively associated with public disorder offenses, which indicates that whites were more likely to be involved in public disorder offenses than nonwhites.

No significant relationships were found at all between the personality factors and offenses against persons or public disorder offending. Extraversion, Agreeableness and Neuroticism did not have a single significant relationship with any type of offending. Openness was significantly and positively associated with illegal service offenses. Conscientiousness had the most significant associations. Conscientiousness was significantly and negatively associated with drug offenses, analogous offenses, property offenses, and general offending. The negative relationships suggest that higher scores on the scale will result in less offending for each of these categories.

Table 28

Summary of OLS Regression Results

	Openness	Conscientiousness	Extraversion	Agreeableness	Neuroticism
Persons					
Property		-			
Analogous		-			
Public Disorder					
Illegal Service	+				
Drug		-			
Offending		-			

- Represents negative significant relationship

+ Represents positive significant relationship

Overall, when controlling for race, sex and age, only a couple of the personality factors were found to have a significant impact on the offense types studied. Only openness and conscientiousness were found to have at least one significant relationship. As for the hypotheses presented for offending, two were supported. Openness was positively associated with offending (Ha1) and conscientiousness was negatively associated with offending (Ha2). No support was found at all for the hypotheses on offending and extraversion (Ha3), agreeableness (Ha4) or neuroticism (Ha5).

Co-Offending. Co-offending was examined to test the following hypotheses of the study:

Ha6: Individuals with higher scores on openness will also have higher levels of co-offending.

Ha7: Individuals with higher scores on conscientiousness will also have lower levels of co-offending.

Ha8: Individuals with higher scores on extraversion will also have higher levels of co-offending.

Ha9: Individuals with higher scores on agreeableness will also be more likely to have higher levels of co-offending.

Ha10: Individuals higher scores on neuroticism will also be more likely to have lower levels of co-offending.

Co-offending as a variable measured whether an individual committed various offenses alone or with others. Responses were separated into two groups – those who did not engage in co-offending at all (coded as zero) and those individuals who engaged in co-offending at any point in time (coded as one). Co-offending was also divided by offense types and examined. The offense categories were the same as the categories used for offending statistics. Only individuals who reported involvement in offending were included in the analysis for co-offending by crime type. Due to a lack of variation in the distribution of co-offending, two categories were created. One group consists of individuals who have no reported incidents of co-offending. The second group consists of individuals who reported any co-offending at all, regardless of how often that person may have co-offended. Since this variable is dichotomous, logistic regression was chosen as the most appropriate statistic.

One problem was found prior to the analyses of this section. When individuals were separated into groups based on offense types and non-offenders were removed, the numbers in each group decreased dramatically. While the overall offending group had 199 individuals in the group, other groups were even smaller. For example, as

noted in table 15, property offenses only consisted of 43 individuals while illegal service offenses had 45 respondents.

Such small groups in a logistic regression are very problematic. Generally, samples for logistic regression should be larger than the required amount for OLS regression. But here, each group became drastically smaller. If the sample is small, the Hosmer and Lemeshow test has a very low power and is unlikely to find deviations from the model (Bewick, Cheek, & Ball, 2005). In OLS regression, the R^2 value becomes biased in small samples. A similar effect is seen here, as the Cox and Snell and Nagelkerke statistics in the various models seem to be inflated, sometimes seeming to explain 50% or more of the variation in the model. Small samples also increase the likelihood of making a Type I error which does not allow confidence in the results.

In this section of the study, the logistic regression analyses for each type of offending was excluded. Generally, no significant results were found in any of these tests, which may be due to the extremely small sample sizes. One significant, positive relationship emerged between agreeableness and property co-offenses, but with only 91 individuals in the group and 8 independent variables, even this test was ineffective at informing any of the hypotheses.

Ninety one people were in the group for property co-offenses. Because the model chi-square value is not significant at $p < .05$, we fail to reject the null and assume that none of the coefficients are significantly different from zero.

Despite the chi-square finding, one of the independent variables were found to be significant at the $p < .05$ level. The coefficient for agreeableness indicates that individuals with higher scores on this factor are more likely to engage in property co-

offending than individuals with lower scores by a factor of .047, while controlling for age, race, sex and other personality factors. The Exp(B) means that for individual with higher scores on agreeableness, the simple odds of property co-offending increases by 4.8% over that of individuals with lower scores. None of the other independent variables in the model were shown to be significant.

The classification table shows the percent of cases for which the dependent variable was correctly predicted. In this model, the predicted percentage was 84.4% for the null model and 84.4% for the full model. It can be determined that the inclusion of the independent variables in the model had no impact on the accuracy of prediction for this model.

Table 29

Logistic Regression Results Measuring the Impact of Personality Factors on Property Co-offending

	B	S.E.	Wald	Exp(B)	95% CI
Age	-.044	.049	.807	.957	[0.869, 1.054]
Sex	1.188	.717	2.742	3.280	[0.804, 13.386]
Race	-21.253	13881.080	.000	.000	[0.000, 0.000]
Openness	.043	.025	3.077	1.044	[0.995, 1.096]
Conscientiousness	.007	.022	.102	1.007	[0.965, 1.051]
Extraversion	.011	.015	.507	1.011	[0.981, 1.042]
Agreeableness	.047	.023	4.327*	1.048	[1.003, 1.096]
Neuroticism	.021	.020	1.090	1.021	[0.982, 1.061]
Constant	15.189	13881.080	.000	3949752.811	[0, 0]

-2LL = 64.466, Cox and Snell = .138, Nagelkerke = .238
Chi Square = 13.335, Hosmer and Lemeshow = 3.465

Analysis of variance. In an attempt to examine the relationship between personality factors and co-offending in greater detail, the differences between the mean scores on each of the personality scales were examined. Offenders were divided into

three groups. Group one consisted of individuals who were not involved in offending on any level. Group two consisted of solo offenders, or individuals who did offend, but were alone in their offending acts. Group three was made up of individuals who were involved in co-offending. The differences in the mean scores for each of the personality factors were examined using ANOVA. In order to test the significant differences, the post hoc tests LSD and Games-Howell were both utilized. LSD is less conservative and assumes equal variances. Games-Howell is more conservative and does not assume equal variances. In the ANOVA results, both methods had consistent and similar findings.

Significant results were found for conscientiousness and agreeableness in the analysis. For conscientiousness, there was a significant difference in means scores between non offenders and co-offenders (LSD $p < .001$, Games-Howell $p < .001$), as well as for solo offenders and co-offenders (LSD $p < .01$, Games-Howell $p < .05$). Agreeableness also had a significant difference in mean scores between non offenders and co-offenders (LSD $p < .01$, Games-Howell $p < .01$).

Table 30

ANOVA Table of Personality Factors and Types of Offenders

	Non offenders	Solo offenders	Co-offenders
N	106	30	169
Openness	70.4717	70.6667	70.0888
Conscientiousness	78.5377 ^B	78.1481 ^C	69.1157 ^{BC}
Extraversion	61.7335	56.25	59.7818
Agreeableness	75.8648 ^B	76.0185	70.217 ^B
Neuroticism	53.3608	50.625	53.1065
A = significant difference between non offenders and solo offenders			
B = significant difference between non offenders and co-offenders			
C = significant difference between solo offenders and co-offenders			

Phase Three

Phase 3 of the study sought to examine the differences in three different groups of offenders. The first group consists of individuals who report no offending at all, on any level. The second group consists of individuals who do offend in general, but do not offend with others. The last group consists of individuals who co-offend on any level. In order to examine the impact of the independent variables on each of these groups, as well as compare the difference between groups, multinomial logistic regression is used. Multinomial logistic regression allows analysis of a nominal level dependent variable that has more than two categories. Since phase three consists of three groups, this is the most appropriate statistic. To interpret the multinomial regression estimates in table 31, one must compare the coefficients for the dependent variable categories (0 = non offenders and 1 = solo offenders) in relation to the reference category (2 = co-offenders).

Table 31

Multinomial Logistic Regression of Personality Factors and Types of Offenders as Compared to Co-offenders

Independent Variables		B	SE	WALD	Exp(B)	95% CI
.00	Intercept	-5.525	1.241	19.831		
	Sex	-.165	.319	.268	.848	[0.453, 1.585]
	Race	.267	.461	.336	1.306	[0.529, 3.225]
	Age	.039	.018	4.939*	1.040	[1.005, 1.076]
	Openness	-.013	.010	1.796	.987	[0.968, 1.006]
	Conscientiousness	.041	.010	15.940***	1.042	[1.021, 1.064]
	Extraversion	-.002	.007	.054	.998	[0.985, 1.012]
	Agreeableness	.020	.010	3.836	1.020	[1.000, 1.0414]
	Neuroticism	.014	.008	3.005	1.014	[0.998, 1.029]
1.00	Intercept	-5.914	1.884	9.854		
	Sex	.045	.499	.008	1.046	[0.393, 2.782]
	Race	.665	.644	1.067	1.945	[0.551, 6.873]
	Age	.070	.022	10.209**	1.073	[1.027, 1.120]
	Openness	-.008	.016	.233	.993	[0.963, 1.023]
	Conscientiousness	.035	.016	4.737*	1.036	[1.004, 1.069]
	Extraversion	-.019	.011	3.079	.981	[0.961, 1.002]
	Agreeableness	.018	.016	1.200	1.018	[0.986, 1.051]
	Neuroticism	.001	.012	.010	1.001	[0.978, 1.025]
-2 Log-likelihood = 507.234						
Model Chi-Square = 50.107***						
Cox and Snell R ² = .153						
Nagelkerke R ² = .182						

*p<.05

**p<.01

***p<.001

To interpret the following multinomial regression estimates in table 32, one must compare the coefficients for the dependent variable categories (1 = solo offenders and 2 = co-offenders) in relation to the reference category (0 = non offenders).

Table 32

Multinomial Logistic Regression of Personality Factors and Types of Offenders as Compared to Non Offenders

Independent Variables		B	SE	WALD	Exp(B)	95% CI
1.00	Intercept	-.388	1.953	.040		
	Sex	.210	.513	.168	1.234	[0.451, 3.375]
	Race	.398	.648	.378	1.489	[0.418, 5.301]
	Age	.031	.020	2.500	1.032	[0.993, 1.072]
	Openness	.006	.016	.133	1.006	[0.975, 1.037]
	Conscientiousness	-.006	.017	.136	.994	[0.962, 1.027]
	Extraversion	-.017	.011	2.462	.983	[0.962, 1.004]
	Agreeableness	-.002	.017	.017	.998	[0.966, 1.031]
	Neuroticism	-.012	.012	1.050	.988	[0.965, 1.011]
-2 Log-likelihood = 507.234						
Model Chi-Square = 50.107***						
Cox and Snell R ² = .153						
Nagelkerke R ² = .182						

The beginning -2 log likelihood with no independent variables in the model is 557.341. The -2 log likelihood with the independent variables in the model is 507.234. The difference between them is 50.107, which is the chi-square value. The null hypothesis being tested is that all of the coefficients are equal to zero. Because the chi-square value is significant ($p < .001$), we can reject the null hypothesis and claim that at least one of the coefficients is not equal to zero. In addition, we can conclude that the model with the independent variables is significantly improved over the model without the independent variables.

The Cox and Snell and Nagelkerke statistics show the explained variation of the dependent variable in the model. These pseudo R-squares show that between 15.3%

and 18.2% of the variance in categorical co-offending can be explained by the full model with all included independent variables.

The likelihood ratio chart shows that age and conscientiousness are the variables with the most significant impact on the -2 log likelihood. Without age in the model, the -2 log likelihood would be 518.427. Without conscientiousness in the model, the -2 log likelihood would be 526.454. Adding both of these values together bring the total closer to the original 557.314 at 528.701. With the other independent variables not being in the model, the final -2 log likelihood with only age and conscientiousness would still be close to the current value of 500.809. If only one of the variables were kept in the model, the value would be around 514, which is very close to the value with all of the independent variables in the model. Conscientiousness also has the biggest Chi-square value (19.220), compared to the other independent variables in the model. Again, this suggests that conscientiousness has the most significant impact on the -2 log likelihood.

Parameter estimates.

Group 1 - non offenders vs. co-offenders. There are several significant findings when examining the differences between non offenders and the reference group of co-offenders. Age (.039, $p < .05$) and conscientiousness (.041, $p < .001$) were both found to be statistically significant in predicting the odds of refraining from offending versus co-offending. The coefficient for age shows that when comparing older individuals to younger individuals, being older increases the likelihood of not offending at all as compared to co-offending. Older individuals have a 40% greater likelihood of not offending when compared to co-offenders. Similarly, individuals with higher scores on the conscientiousness scale are 42% more likely to be non offenders than co-

offenders. Agreeableness also approaches significance in this model (.020, $p = .050$). Since the significance of this variable is so close to the cutoff, it must be considered that individuals with higher scores on the agreeableness scales are also more likely to be non offenders than co-offenders.

The confidence interval is a way of testing the null hypothesis that the independent variables have no impact on the simple odds of not offending, when compared to co-offending. Because one is not included in the intervals, we reject the null hypothesis and conclude that age and conscientiousness have a significant effect on the simple odds of not offending, when compared to co-offending. It is important to note, however, that the interval for agreeableness has 1.00 at the lower bound of the interval. Agreeableness may not have as significant an impact on non-offending as age and conscientiousness in this model.

Group 2 – solo offenders vs. co-offenders. There are two significant variable indicated in the model to help distinguish between solo offenders and co-offenders. The coefficient for age (.070, $p < .01$) indicates that being older increases the likelihood of solo offending as compared to co-offending. The Exp(B) shows that there is a 7.3% increase in the simple odds of solo offending for each unit increase in age when compared to co-offending. The coefficient for conscientiousness (.035, $p < .05$) also indicates that individuals with higher scores on the scale are more likely to solo offend when compared to co-offenders, which is a 36% increase in the simple odds of solo offending.

None of the other variables were found to be significant in this model. Because the Wald values are not significant, we fail to reject the null hypothesis and claim that

the coefficients for these variables are not significantly greater than zero, while controlling for the other variables in the model. When examining the confidence intervals, since one is included in the interval, we fail to reject the null hypothesis and conclude that none of the other variables in the model have a significant effect on the simple odds of solo offending, when compared to co-offending.

Group 3 – non offenders vs. solo offenders. When looking at the differences between non offenders and solo offenders, no significant differences were noted. Because the Wald values are not significant, we fail to reject the null hypothesis and claim that the coefficients for these variables are not significantly greater than zero. When examining the confidence intervals, since one is included in the intervals, we fail to reject the null and conclude that none of the variables in the model have a significant effect on the simple odds of solo offending, when compared to non offenders.

The overall percentage predicted correctly in this overall multinomial logistic regression model was approximately 61.9%. The model correctly predicted those who were co-offenders more than any other group (85.1%). It also correctly predicted approximately 42.3% of those who were non offenders and not involved in any type of offending. However, the model did not accurately predict those who were solo offenders (0%).

Table 33

Classification Table for Multinomial Regression

Observed	Predicted			Percent Correct
	.00	1.00	2.00	
.00	44	1	59	42.3%
1.00	14	0	16	.0%
2.00	25	0	143	85.1%
Overall Percentage	27.5%	.3%	72.2%	61.9%

Summary

When comparing across groups of non offenders, solo offenders and co-offenders, age and conscientiousness were consistently found to have a significant relationship with the dependent variables as well as the overall model. Age and conscientiousness were able to differentiate between non offenders and co-offenders, as well as solo offenders and co-offenders. Individuals with higher scores on conscientiousness and older individuals were more likely to avoid offending or offend alone than co-offend. Agreeableness ($p=.070$) also approached significance in differentiating between non-offenders and co-offenders.

Results Summary

Overall, there is mixed but limited support for the hypotheses in the current study. When looking at personality, only two factors had significant relationships with some type of offending. Openness was significantly and positively associated with illegal service offenses. Conscientiousness was significantly and negatively related to drug, analogous, property and overall offending in the OLS regression. Both ANOVA and multinomial logistic regression showed that conscientiousness was also significantly able to distinguish between individuals who did not offend versus co-offenders, and individuals who were solo offenders versus co-offenders.

Agreeableness did not have any significant relationships in the OLS regression results section. A difference of means test resulted in a significant difference on agreeableness scores between non offenders and co-offenders. However, while agreeableness did not meet the cutoff for significance in multinomial logistic regression,

it did approach significance for distinguishing between non-offenders and co-offenders. As mentioned previously, extraversion and neuroticism were not found to have a significant relationship with any types of offending or co-offending.

While no hypotheses were presented for the control variables, significant relationships did emerge. Age was significantly and negatively related to offenses against persons and analogous offenses. Age was also able to distinguish between non-offender versus co-offenders as well as solo offenders versus co-offenders. Race was significantly and negatively related to public disorder offending, which suggests that whites were more likely to commit these offenses than nonwhites. Finally, sex was negatively related to offending, public disorder offending and offending against persons. Stated otherwise, men were more likely to engage in these types of offending than women.

The following chapter will discuss the findings of this study. In addition, the final chapter will address any policy implications and directions for future research.

CHAPTER FIVE DISCUSSION AND CONCLUSIONS

This study began with three purposes. First, the study sought to examine the relationship between personality and offending. Second, the FFM of personality was used to determine whether or not there was a difference between individuals who participated in different types of offending. Finally, the relationship between personality factors and co-offending was explored. This chapter is intended to present a brief summary of key findings from Chapter Four, discuss the policy implications for the criminal justice system and suggest directions for future research.

Eysenck (1964) laid out a theory that described the relationship between personality and criminal behavior. Eysenck sought to explore the factors that prevented individuals from becoming involved in criminal activities. It was his contention that everyone could be conditioned to know that punishment would follow criminal behavior. He also included a biological component that stated that all individuals had an optimal level of arousal in the brain that must be maintained. Behavior changed when arousal was no longer at this optimal level.

Eysenck (1964) argued extraverts were individuals who were poorly conditioned and needed more external stimulation than other people. For this reason, they were considered to be more outgoing in an attempt to find additional stimulation. Neurotics were easily upset and prone to experience negative emotions. Eysenck (1964) also added a third category of psychotics who had unstable emotions and were also more likely to be violent. In general, criminals were more likely to have higher scores on psychoticism, extraversion, and neuroticism (PEN) scales.

The current study uses Eysenck's PEN theory as the theoretical foundation for research. However, to include the most current developments in the field of personality psychology, the Five Factor Model of personality was utilized in the current study (Costa and McCrae, 1995). The five factors are Openness, Conscientiousness, Extraversion, Agreeableness, and Neuroticism (OCEAN). The factors of extraversion and neuroticism are the same as Eysenck's (1964) factors. In addition, Eysenck (1992) has also argued that agreeableness and conscientiousness are both facets of psychoticism.

Offending

To date, there are still few studies that examine the relationship between OCEAN and criminal behavior. Though there have been only a handful of studies, the results for all of the factors have been mixed. Openness is generally shown to be positively correlated to crime, but is not often significant (Miller & Lynam, 2001). However, Clower and Bothell (2001) found openness to be negatively correlated with arrests. Extraversion also has mixed results in the literature. Laak, deGoede, Aleva, Brugman, van Leuven, and Hussmann (2003) found that extraverts were more likely to commit status offenses. Voller and Long (2010) reported different results and found that rape perpetrators actually had lower scores on extraversion.

For the other three factors, the results have tended to be more consistent, though note there is still not perfect agreement. Conscientiousness and agreeableness have both been repeatedly shown to be negatively related to criminal behavior (Laak et al., 2003; Hornsveld & de Kruyk, 2005, Wiebe, 2004; Voller & Long, 2010). Neuroticism has been shown to be positively correlated with specific types of offending, such as

causing property damage (Laak et al., 2003), sexual violence (Hornsveld & DeKruyk, 2005) as well as use of aggression (Hines & Saudino, 2008).

While past empirical research on the relationship between personality and crime has provided important findings, the literature has also been limited. The majority of individuals examined in relationship to personality and crime have been incarcerated offenders (Alexio & Norris, 2000; Bartol & Holanchock, 1979; Berman & Paisey, 1984; Blackburn, 1971; Eysenck, 1970; Listwan, Voorhis, & Ritchey, 2007). This is not an ideal study group due to the uncertainty of the impact of incarceration on the mental health or mental state of prisoners. Research has shown that it is possible that the status of being institutionalized changes the personality of the offender (Bohm, 2001). In addition, everyone who offends is not necessarily incarcerated, while everyone who is incarcerated is not necessarily an offender.

When the research is not examining offenders, the focus tends to turn towards juvenile offenders. While this is a valid group for study, it ignores adult offenders. It is possible that the role of personality in adult offending is different from the role of personality in juvenile offending. To address this shortcoming, the current study utilized a sample of college adults.

Another limitation of the literature was the use of difference of mean tests and correlations to examine the role of personality in explaining offending. Such statistical tests do not allow for the consideration of the role of rival causal factors. If no control variables are included in the models, there is no way of knowing whether the relationship is spurious. While the current research used ANOVA to look for differences in mean scores, other higher order statistics were also utilized.

Co-Offending

Co-offending is defined as committing criminal acts with two or more offenders (van Mastrigt & Farrington, 2009). Criminological research supports the idea that the learning of criminal behavior takes place through association with peers (Akers, 1998; Curry, Decker & Egley, 2002; Lanza-Kaduce & Capece, 2003). Past research has attempted to explain co-offending by examining how co-offending groups are formed. In this research on co-offending, the importance of the individual in criminal co-offending may be overlooked. This study examined offending and co-offending in reference to the impact of individual level explanations

One of the shortcomings of the existing co-offending literature was also a problem in offending literature. Co-offending literature also suffers from a reliance on juvenile populations as the sample for study (Conway & McCord, 2002; Erickson, 1971; Erickson & Jensen, 1977; Pettersson, 2005; Warr, 1996). Research suggests that co-offending is a characteristic of juvenile populations and explains why crime peaks during the adolescent and teenage years (Reiss & Farrington, 1991; Stolzenberg & D'Alessio, 2008; Warr, 2002). Despite this fact, there have been few studies that included adult samples (Carrington, 2002; Hodgson, 2007; Reiss & Farrington, 1991). The current study was an effort to expand on the literature utilizing adult populations by examining only individuals over the age of 18.

The main contribution of the current research was the examination of two issues that have not been fully explored in criminal justice research. Neither co-offending nor the impact of personality psychology on general offending behavior has received thorough examination in the existing literature. This study was an effort to explore the

relationship between individual characteristics and offending, as well as on the individual characteristics that can lead to the commission of offenses within groups.

Methods

This study utilized survey research only. Subjects were selected using a simple random sample of currently enrolled university students during the spring semester of 2011. All student campus email addresses were included in a list. A sample of 2,000 was chosen randomly from that by the applied research lab at the University. The sample was then emailed the survey information. Data were collected through the use of an anonymous, online survey via the Qualtrics survey system. This system allowed a participant to take the survey at any computer with internet access. The survey was created and all responses were maintained within the Qualtrics system. Introductory messages were emailed to the targeted individuals informing them that they would be receiving information requesting that they participate in the survey. A few days later, the Qualtrics link to the survey was included in an invitational email message. Reminder messages were also sent after a week in an attempt to increase participation rates.

Participants in this study were adults over the age of 18. The total number of participants in the study was 305. Approximately 33% of the sample was male and 67% was female. Ninety percent of students who responded were white and their ages ranged from 18 to 59. In this survey, students answered questions about demographics, social desirability, and personality characteristics. The survey also asked questions about the frequency of participation in offending and co-offending behaviors.

Though the current study sought to further add to the literature on personality and crime, it was also designed with the intention of filling in the gaps left by previous studies by utilizing more reliable measures. This study utilized a sample of adults rather than incarcerated or juvenile offenders used in previous studies. Both males and females were used in this study, which differs from the use of only males as indicated in many other previous studies. This study used the Big Five Inventory (BFI) as a measurement instrument for personality derived from the Five Factor Model, which is the most widely accepted typology of personality in the psychological community.

Conclusions

This study addressed some of the questions proposed in previous studies, as well as some new questions for consideration that have been alluded to in past results, but not examined in depth. This study examined the following four main questions:

RQ1. Do personality factors influence the frequency of involvement in offending behavior?

RQ 2. Do personality factors increase or decrease co-offending?

RQ3. Can personality factors predict who is more likely to offend alone, with others, a mixture of both, or not at all?

RQ4. Can personality factors predict involvement in particular types of offending?

Findings for Personality and Offending

The first set of hypotheses explored whether personality factors have a significant relationship with offending. The hypotheses and findings are discussed below.

Ha1: There is a significant, positive relationship between openness and offending.

Ha2: There is a significant, negative relationship between conscientiousness and offending.

Ha3: There is a significant, positive relationship between extraversion and offending.

Ha4: There is a significant, negative relationship between agreeableness and offending.

Ha5: There is a significant, positive relationship between neuroticism and offending.

Similar to findings in other research (Hines & Saudino, 2008; Laak et al., 2003), openness was positively associated with offending. However, a significant and positive relationship was found only for illegal service offenses.

Conscientiousness had the strongest findings of all the personality factors included in the study. A significant, negative relationship was found for property offenses, analogous offenses, drug offenses and overall offending. As mentioned previously, this finding is supported by a wealth of past research (Clower & Bothwell, 2001; Hornsveld & de Kruyk, 2005; John, Naumann, & Soto, 2008; Laak, 2003; Voller & Long, 2010; Weibe, 2004). While there is no definitive explanation for such consistent findings, there may be one overlooked rationale. It is possible that the findings for conscientiousness are due to the populations under study in the research. Much of the research that showed significant and negative relationships also used student populations for study (Heaven, 1996; John et al., 1994; Mak et al., 2003). Students

would be considered a conscientious group by many, and as they pursue a degree, may be naturally less likely to be involved in offending. While this is merely a suggestion, the impact of the sample must be considered in light of such consistent findings.

No significant relationships were found at all between extraversion and any type of offending. Initially, this finding may seem to deviate from many other findings for extraversion. Note, however, that not all research reported significant and positive relationships. In past research, there were several studies that also found no significant relationships between extraversion and offending (Clower & Bothwell, 2001; Eysenck & Eysenck, 1977; Heaven, 1996; Little, 1963). The majority of the research that did find significant relationships did not use higher order statistics, but consisted mostly of correlations (Eysenck, 1970; Eysenck & Eysenck, 1971). This may account for the discrepancy in the final results.

The findings for agreeableness also lacked significant relationships in the OLS regression. The hypothesis for the study was based on the majority of prior research, however, there were studies that failed to find significant results. Laak et al. (2003) did not find any significant results with delinquency, and Clower and Bothwell (2001) did not find any significant relationships with recidivism.

No significant relationship in OLS regression was found for neuroticism. While the prior research had mixed results, the hypothesis was largely based on the PEN theory proposed by Eysenck (1964). According to the theory, neuroticism should have a positive relationship with offending. However, prior research also had similar findings to the current study. Additional studies found no significant relationships at all between neuroticism and offending (Clower & Bothwell, 2001; John et al., 1994; Mak et al.,

2003). With this in mind, while there is no support for the proposed hypotheses, the findings of this study are not surprising in light of some of the research.

There are several factors that may explain the difference between the results of the current study and the results found in prior research. First, this study examined a sample of college adults. Much of the prior research studied personality and offending using a sample of juvenile delinquents, psychiatric patients (Hornsveld & de Kruyk, 2005) or incarcerated offenders. Only one study reviewed here utilized a college student population (Hines & Saudino, 2008), but even this study focused only on a very specific type of offending.

Another factor that rendered across-study comparisons difficult was the measurement of offending in the research. Though the past research encompassed a wide variety of offenses, all studies did not measure the same offenses. Some studies examined only violence (Hornsveld & de Kruyk, 2005) while others focused on specific offenses such as aggression against an intimate partner (Hines & Saudino, 2008). Most studies also did not include general measures of offending. The closest general measure of offending was in the Eysenck (1977) article, which measured several different types of offending. Due to this lack of consistent measurement of the offending variable, it is difficult to compare the findings of the entire body of research on this topic. Perhaps this breakdown of offenses affects the results of the studies. If researchers do not all have the same dependent variable, or the dependent variables are not operationalized in the same way, then differences in the results are to be expected.

In this study, the BFI was used to measure personality. It is hard to compare the results of this study to other studies, when several different measures have been used

in past research. Other studies have used the EPQ, the EPI, the Maudsley personality inventory, the NEO-FFI and many other personality inventories, but none used the BFI. This failure to use standardized (or even comparable) instruments to measure personality factors may result in the same concepts being operationalized differently across studies. This could lead to drastically different findings across studies. Since there do not appear to be any studies that compare these various instruments to ensure reliability across measures, one cannot necessarily compare the results across studies.

Findings for Personality and Co-Offending.

The second set of hypotheses explored whether personality factors have a significant relationship with co-offending. The hypotheses and findings are discussed below.

Ha6: Individuals with higher scores on openness will also have higher levels of co-offending.

Ha7: Individuals with higher scores on conscientiousness will also have lower levels of co-offending.

Ha8: Individuals with higher scores on extraversion will also have higher levels of co-offending.

Ha9: Individuals with higher scores on agreeableness will also be more likely to have higher levels of co-offending.

Ha10: Individuals higher scores on neuroticism will also be more likely to have lower levels of co-offending.

Of all the logistic regression models run for this study, there was only one significant finding in reference to co-offending and personality. Property co-offending

was found to be significantly and positively related to agreeableness. This finding would suggest that individuals with higher scores on the agreeableness scale are also more likely to engage in property co-offending. The relationship is in the hypothesized direction. The hypothesized direction was positive because to co-offend, we would expect someone to be more agreeable and more likely to get along with others.

Note that this model was not included in the results section due to serious limitations. A significant relationship emerged despite the small sample size. While there were only 91 people in the group, a significant relationship was still detected. This speaks to the strength of the relationship between agreeableness and property co-offending.

The findings for all four of the remaining co-offending hypotheses were the same. When looking at co-offending, none of the other personality factors included in this study (openness, conscientiousness, extraversion, neuroticism) had significant results. According to the bivariate correlations, conscientiousness was also significantly related to co-offending. However, when controlling for rival causal factors, this relationship was no longer found to be significant. A few factors to remember with this analysis may explain these findings. First, this section of the study was predominately exploratory since none of the prior research had attempted to use personality factors to explain co-offending. Despite the hypotheses, the findings in this study did not support any of them. That may be a very valuable finding in itself. It is possible what is gained from this study is the knowledge that while personality factors do play a significant role in explaining offending, they are not as salient in explaining co-offending. Individual level

factors may help to explain individual level offending, but perhaps there are other factors that would better explain co-offending.

The second important fact to remember in this study is the issue of the sample size in the different co-offending groups. One of the reasons for the lack of significant findings between personality factors and the various types of co-offending could be the sample sizes. In this section of the study, sample sizes ranged from 43 for co-offenses against persons to 160 for drug co-offenses. This is understandable due to the fact that the sample for this study was taken from a University population. This sample was not made up of offenders, and for this reason very large amounts of offending was not to be expected. Such small sample sizes do not prohibit analysis using logistic regression, but it does diminish the likelihood of finding any additional significant relationships. No definitive assessments can be made about the information gleaned from this analysis due to the limitations of the sample.

Difference between Non-Offenders, Solo Offenders, and Co-Offenders

To further examine the utility of personality factors in explaining differentiating between non offenders, solo offenders and co-offenders, additional analyses were run. Several significant relationships were noted. An ANOVA test was utilized to determine the difference in the mean personality scores between the three groups of offenders for general offending.

The results of the ANOVA showed that conscientiousness scores were significantly different between non offenders and co-offenders, as well as between solo offenders and co-offenders when examining general offending. Multinomial logistic regression was also employed to further test these findings. Results indicated the same

significant relationships for conscientiousness. Scores on conscientiousness were significantly different between non offenders and co-offenders, as well as between solo offenders and co-offenders.

This is a relationship that makes intuitive sense. Individuals who are more conscientious are generally also more hardworking and disciplined. It would then follow that they are less likely to be involved in co-offending. However, an interesting finding is that there was no significant difference in conscientiousness between non offenders and solo offenders. This is not as easily explained. If an individual was truly conscientious, it may be assumed that the person would be too focused and hard working to become involved in any offending activities on any level. While this may be a valid assumption, it is important to consider the focus of conscientiousness. As Blickle, Schlegel, Fassbender, and Klein (2006) reported, conscientiousness in white collar crimes tended to be evidenced by an increase in offending if it was seen as offending to “get ahead”. Then, that hard work and determination could result in criminal behavior if the offense was understood by the offender to enhance personal goals of success.

Agreeableness also had significant findings in the ANOVA statistics. Agreeableness scores were significantly different between non offenders and co-offenders. Since agreeableness refers to individuals who are sympathetic to others and want to help others, it is possible that people with higher scores on this variable care about the opinions of the general community. If this is the case, then people will choose to exhibit behaviors that gain approval and refrain from offending with others.

In the multinomial logistic regression, this relationship was examined in greater depth. Agreeableness greatly approached significance ($p=.050$) in differentiating

between non offenders and co-offenders. Since the significance level is right at the cutoff for acceptability, the result is considered to be a very important finding in this research and further supports the ANOVA findings.

Further consideration must be given to the relationship between agreeableness and offending. Agreeableness was shown to have a negative relationship with offending, but had a positive relationship with co-offending. ANOVA and multinomial regression show that agreeableness scores are different between non offenders and co-offenders. To explain these findings, the definition of agreeableness must be examined. Agreeableness refers to people who are more sympathetic to others, care about the opinions of others, and may be more trusting. A person that fits this description may possibly be agreeable to a fault. Perhaps this individual is too trusting and follows others into criminal situations. Perhaps this individual cares so much about the opinion of others that (s)he feels unable to say no when the group gets involved in offending.

It may seem odd that high scores on agreeableness did not also explain the difference between non offenders and solo offenders. This reverts back to the relationship revealed in the OLS offending regressions. Individuals with higher agreeableness scores were found to be less likely to offend. However, it is possible that someone would have low agreeableness scores and still be a solo offender. It is the very nature of an agreeable person that would enable him or her to commit offenses alone, and not with others. Solo offenses can still be concealed from the public and public perception would be that the individual was a non offender. An individual does not carry the same risk of losing the respect of others when offending alone, but the chances are very great when in a group. ...

Limitations

While this study does much to improve on past research, there are still a few limitations to the current research and a few validity concerns in this research. Of particular note is statistical conclusion validity. The biggest problem in sections of this study seems to be the sample size. First, the overall population, which included 305 individuals, was not very large. One of the reasons for the small sample size could be the implementation of the online survey design for this study. Online surveys tend to have lower response rates than face-to-face surveys. However, the final response rate, which includes only the completed questionnaires, was 15.25%.

While the sample was sufficient according to all conventional standards, when it was broken into co-offending groups based on offense types and non offenders were removed, a sample of 305 was no longer sufficient. There was not enough variation in the offending types to draw accurate statistical conclusions. This increased the risk of making a type II error. It is highly possible that there are more significant relationships in the logistic regression models that have not been illuminated due to this problem.

One way that the response rate could have been increased would have been to create another sample of students at the university. However, the rule of the Academic Computing Policy Advisory Committee at the university dictated that only one sample of 2,000 may be requested for each research project to prevent over-sampling. Attempts to collect data at another site were unsuccessful. Despite repeated email reminders, the final number of completed surveys for this study was 305 participants.

Another concern in this study is that the recall period for criminal acts is 1 year. It is noted that it may be difficult to get a precise count of the frequency of events with

such a broad recall period, especially for more minor or frequently occurring offenses. However, using a shorter time period may not have captured the wide range of behaviors that may not happen on a regular basis.

Generalizing to a specific population remains a problem in social science research. Unless taking a random sample in the U.S., this is very difficult to accomplish. The sample used in this study was a sample of young undergraduates at a residential university and may not be considered the “typical” or “normal” American citizen . This sample had a low response rate (15%) and there were differences between the sample and the university population. As noted in Table 4, the sample was overrepresented on non-offenders, whites, females, and older students. The sample provided was not a sufficient generalization for an entire university population, much less the county, state, or country.

Despite this fact, generalization is not a salient concern in this study. The only true requirement was that the individuals in the study were non-institutionalized adults. Since personality is being examined, it was expected that a wide variety of personalities would be present in any sample and that there would be enough variation to draw some tentative conclusions. This research is only intended to compare relationships or patterns in relationships between personality and deviance, not to establish a deviant profile or to be deterministic in any way. Therefore, any sample of adult individuals should be sufficient to begin an exploration into the relationship between personality and deviance.

One final limitation of this study is that the study did not test any traditional criminological explanations of offending behavior. This study did not control for other

well researched theories that may have also impacted this study. There is the possibility that the explanatory power of the models may have been stronger if other theories had been included. This is especially important when studying co-offending. Perhaps social bonds or differential association could shed more light on the relationship between personality factors and co-offending. Regardless of the potential relationships, other theories must be introduced to the research to rule out rival causal factors.

Policy Implications

To reduce offending, more attention must be given to the role of personality factors. Specifically, higher levels of conscientiousness contribute to decreased offending and help to differentiate between non-offenders and co-offenders. For certain types of offending, openness may also play a role. To properly implement changes, one must address individual level explanations. If personality impacts behavior, then treatment should also focus on the behavior, but more importantly on the specific traits that are the root cause. Addressing offending should focus on psychological treatments that include behavioral modification and therapy to deal with the personality shortcomings.

It is evident from this study that higher levels of conscientiousness make one less prone to offend. If the individuals who are more likely to offend are not as developed in this area, there may be a possibility of addressing this problem. Perhaps psychological intervention or training is necessary. Conscientiousness may be taught in many ways. It is possible to teach discipline and achievement motivation through methods such as motivational interviewing and cognitive behavioral therapy.

Motivational interviewing is a process of counseling by which a therapist utilizes listening skills to first understand the viewpoint and goals of an individual. Once the individual's view and motivations for behavior have been expressed, the counselor asks questions designed to make the individual reflect on their thought and decision making process (Rollnick & Allison, 2004). This process is not meant to be a confrontational or adversarial process. However, the questioning is intended to spark dissent within the mind of the individual. An individual will begin to question his or her own thought processes. It is at this point that the behavioral changes can begin. The first step is realizing that behaviors need to be changed, and being internally motivated to change. Motivational interviewing has been used with such behaviors as smoking, drugs, alcohol use, and gambling. According to a meta-analysis of studies on motivational interviewing by Hettema, Steele, and Miller (2005), when comparing a group receiving the therapy to groups not receiving the therapy, the effects of motivational interviewing are either maintained or increased over time.

Cognitive behavior therapy is another form of therapy where the therapist attempts to help an individual understand the relationship between feelings, beliefs and thoughts. By understanding these relationships, individuals can begin to grasp the impact they have on behavior. As in motivational interviewing, beliefs and perceptions are challenged in the hopes of sparking behavioral change. This method has been shown to be successful with sex offenders (Thakker & Gannon, 2010) and in decreasing aggressive behaviors (Lesure-Lester, 2002).

Recommendations for Future Research

To address the methodological issues of this study, future research should first consider the sample. Researchers must make sure that there is enough variation in offending among the sample to allow for examination when divided by types of offenses. A larger overall sample may ensure that when non offenders are removed for the co-offending analysis, there will be enough offenders remaining to allow for meaningful statistical analysis. In addition, future research needs to focus on a variety of groups that are more suitable for study aside from incarcerated offenders, psychiatric patients and juveniles. While it is acknowledged that college students may limit the ability to generalize to the larger society, future research should use equivalent groups in order to allow for meaningful comparisons across studies.

In addition, the effect of sex should also be examined in greater depth. There was a significant difference in offending and co-offending by gender. While there is no definitive consensus to show that there are differences in personality based on gender, it would be a good idea to examine the differences in offending and co-offending by gender. Prior research conducted with both men and women found differences between the sexes when examining offending behaviors. Van Mastrigt and Farrington (2009) found that women were more likely to co-offend than men. Though all logistic regression results were not presented here, the current study supported those findings and showed that women tended to be more likely to co-offend, though men were more likely to offend in general (alone and overall). More research needs to be conducted on the role of gender in co-offending to develop a greater understanding of why women are less likely to offend, but more likely to co-offend when they do.

In the past, several approaches have been utilized in trying to explain co-offending. Some research has attempted to examine how co-offending groups are formed. Many researchers have used differential association to determine whether co-offending can be explained by association with delinquent peers. In particular, the ideas of social learning state that association with delinquent peers will then lead to engagement in criminal activities. Some researchers propose that an individual who has criminal friends or is surrounded by offenders, would be most likely to co-offend (Stolzenberg & D'Alessio, 2008). Weerman (2003) and explained co-offending as an exchange of goods and services between individuals. In this process, offenders commit crime together either for material payments or for social recognition. McCarthy, Hagan and Cohen (1998) took another approach that explained co-offending as the result of collective rationality. This meant that offenders realized that, at times, getting what they want would necessitate that others were involved and would also benefit from the crime.

One of the shortcomings of the literature is evidenced by the fact that despite the information that currently exists on co-offending, some important questions remain unanswered. Even if the ideas of differential association are correct, one needs to ask about the circumstances that cause an individual to seek association with criminal or offending friends. If co-offending is the result of a measured decision or even of an exchange for necessities, the issue regarding what causes or allows an individual to enter into a criminal agreement with others still is not answered. Perhaps an individual level explanation is most helpful to determine what particular traits are present in people who are likely to offend with others. The study of personality and co-offending may offer

the solution to this problem. Currently, no comparison between internal and external explanations can be made because it was never attempted in the same study.

Future research should also explore the reasons that certain personality types are less likely to offend or co-offend in greater depth. The question of why conscientious people commit fewer co-offenses has yet to be sufficiently answered. These traits are seen as common and, at times, admirable traits. The current study has shown that this factor seems to offer protection from offending. Perhaps research has been asking the wrong questions. The focus may not need to be on why people offend, but even when looking at individual level explanations, the true issue is how certain factors insulate individuals from offending. This approach may resemble the approach of other control theories in research.

Other theories also need to be included in this discussion. This will allow for a comparison of the utility of personality factors in explaining offending in light of more mainstream criminological theories. For example, even though prior research has suggested that self control is simply an aspect of personality (Romero et al., 2003), it would be important to see the relationship between personality, self control and offending. It would also be beneficial to compare the correlations between self control and OCEAN to determine which typology does a better job of explaining offending.

Finally, future research should strive to use similar personality measures. There are so many different typologies and a variety of different measures. Future research should at least strive to use comparable measures. While it is understandable that personality psychology may change, for now, OCEAN is the most widely accepted

general typology of personality. Research should at least measure OCEAN and use measures that address all five factors. This will allow for a better comparison of results.

The study of the relationship between personality and offending still has much to offer to the field of criminology. We have not yet learned everything that there is to learn or studied everything on this topic. The mere fact that the research in this area has so many mixed results is evidence of this fact. When looking at the entire body of research, it is clear that personality does have a significant impact on offending. However, that relationship may vary among personality types and across offense types. Research on personality and co-offending has been largely ignored. Much more research is needed in this area in order to identify consistent findings and truly understand the nature of the relationship between individual level factors and offending.

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APPENDICES

APPENDIX A

SURVEY INITIAL EMAIL

Hello,

My name is Kenethia McIntosh and I am a PhD student working on the completion of my dissertation here at IUP. I am writing to you to ask for your help.

Within the next couple of days, you will be receiving a survey from me at this same email address. I would really appreciate it if you could take a few moments to complete it. You are not obligated to take the survey, but if you do, your answers will be totally anonymous. As a student myself, I understand how busy your days are. The more students that answer the survey, the more accurate my analysis will be.

I truly thank you in advance for participating in this study.

Kenethia McIntosh, Doctoral Candidate
sqsl@iup.edu or 724-357-2720
Indiana University of Pennsylvania
Department of Criminology
Wilson Hall, Room 200
Indiana, PA 15705

APPENDIX B

SURVEY INVITATION EMAIL

Hello,

You are invited to participate in a research study. My name is Kenethia McIntosh and I am asking for your participation to help me gather information to complete my dissertation. The following information is provided in order to help you to make an informed decision whether or not to participate. If you have any questions, at any time, please do not hesitate to ask.

The link provided below is for an online survey. This survey is designed to gather information on how your personal attitudes and characteristics impact your behavior. Participation in this study will require approximately twenty minutes of your time and you can complete the survey at your leisure.

You are eligible to participate because you are a student at IUP and because your email address was randomly chosen to participate in the study. The expected risk to you in completing this survey is expected to be minimal or nonexistent. Your participation will have no legal or academic penalty or loss of benefits whatsoever. If you choose to participate, your identity and answers will remain completely anonymous. No email addresses or identifiers will be associated with your responses so there is no way to know which survey is yours.

Your participation in this study is completely *voluntary*. You are free to decide not to participate in this study or to withdraw at any time. If you choose not to participate simply ignore this email and do nothing further. This will be considered to be an indication of your desire not to participate. Should you begin the survey and choose to stop before you finish, simply exit the survey your responses will not be included in my final analysis.

Again, your participation in this study is completely voluntary. Thank you in advance for your consideration and assistance with this project. If you have any questions or comments while completing the survey, please feel free to send me an email. If you would like to receive any additional information about this study, please feel free to contact me or my dissertation chair, Dr. Dennis Giever.

Thank you again for your time and support.

Kenethia McIntosh, Doctoral Candidate
sqsl@iup.edu or 724-357-2720

Indiana University of Pennsylvania
Department of Criminology
Wilson Hall, Room 200
Indiana, PA 15705

Dennis Giever, Ph.D., Professor
dgiever@iup.edu or 724-357-6941
Indiana University of Pennsylvania
Department of Criminology
Wilson Hall, Room G12
Indiana, PA 15705

This project has been approved by the Indiana University of Pennsylvania Institutional Review Board for the Protection of Human Subjects (Phone: 724/357-7730).

I have read and understand the information on the form and I consent to volunteer to be a participant in this study. I understand that my responses are completely confidential and that I have the right to withdraw at any time. Completing and returning this survey implies my consent to participate.

Follow this link to the Survey:

[\\${!://SurveyLink?d=Take the Survey}](#)

Or copy and paste the URL below into your internet browser:

[\\${!://SurveyURL}](#)

Follow the link to opt out of future emails:

[\\${!://OptOutLink}](#)

APPENDIX C

SURVEY FOLLOW-UP EMAIL

Hello again,

A little over a week ago, you received an invitation to participate in a research study. My name is Kenethia McIntosh and I am writing to you again to ask you to consider participating to help me gather information to complete my dissertation. The following information is provided in order to help you to make an informed decision whether or not to participate. If you have any questions, at any time, please do not hesitate to ask.

The link provided below is for an online survey. This survey is designed to gather information on how your personal attitudes and characteristics impact your behavior. Participation in this study will require approximately ten to fifteen minutes of your time and you can complete the survey at your leisure.

You are eligible to participate because you are a student at IUP and because your email address was randomly chosen to participate in the study. The expected risk to you in completing this survey is expected to be minimal or nonexistent. Your participation will have no legal or academic penalty or loss of benefits whatsoever. If you choose to participate, your identity and answers will remain completely anonymous. No email addresses or identifiers will be associated with your responses so there is no way to know which survey is yours.

Your participation in this study is completely voluntary. You are free to decide not to participate in this study or to withdraw at any time. If you choose not to participate simply ignore this email and do nothing further. This will be considered to be an indication of your desire not to participate. Should you begin the survey and choose to stop before you finish, simply exit the survey your responses will not be included in my final analysis.

Again, your participation in this study is completely voluntary. Thank you in advance for your consideration and assistance with this project. If you have any questions or comments while completing the survey, please feel free to send me an email. If you would like to receive any additional information about this study, please feel free to contact me or my dissertation chair, Dr. Dennis Giever.

Thank you again for your time and support. It truly means a lot.

Kenethia McIntosh, Doctoral Candidate
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This project has been approved by the Indiana University of Pennsylvania Institutional Review Board for the Protection of Human Subjects (Phone: 724/357-7730).

I have read and understand the information on the form and I consent to volunteer to be a participant in this study. I understand that my responses are completely confidential and that I have the right to withdraw at any time. Completing and returning this survey implies my consent to participate.

Follow this link to the Survey:

[\\${!://SurveyLink?d=Take the Survey}](#)

Or copy and paste the URL below into your internet browser:

[\\${!://SurveyURL}](#)

Follow the link to opt out of future emails:

[\\${!://OptOutLink}](#)

APPENDIX D

SURVEY THANK YOU EMAIL

Hello,

I would just like to take a minute to thank you all for your participation in my survey research. As I mentioned in my previous emails, your identity and answers will remain completely anonymous. No email addresses or identifiers are associated with your responses so there is no way to know which survey is yours.

If you would like to receive any additional information about this study, please feel free to contact me or my dissertation chair, Dr. Dennis Giever. For those of you who sent me emails to request a copy of the results, I hope to get those to you in the next few months. I have saved your email addresses and will forward the information to you as soon as it is ready.

Thank you again for your time and support. It truly means a lot.

Kenethia McIntosh, Doctoral Candidate
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APPENDIX E

SURVEY QUESTIONNAIRE

Part I

Here are a number of characteristics that may or may not apply to you. For example, do you agree that you are someone who *likes to spend time with others*? Please write a number next to each statement to indicate the extent to which **you agree or disagree with that statement.**

1	2	3	4	5
Disagree Strongly	Disagree a little	Neither agree nor disagree	Agree a little	Agree strongly

I am someone who...

1. _____ Is talkative
2. _____ Tends to find fault with others
3. _____ Does a thorough job
4. _____ Is depressed, blue
5. _____ Is original, comes up with new ideas
6. _____ Is reserved
7. _____ Is helpful and unselfish with others
8. _____ Can be somewhat careless
9. _____ Is relaxed, handles stress well.
10. _____ Is curious about many different things
11. _____ Is full of energy
12. _____ Starts quarrels with others
13. _____ Is a reliable worker
14. _____ Can be tense
15. _____ Is ingenious, a deep thinker
16. _____ Generates a lot of enthusiasm
17. _____ Has a forgiving nature
18. _____ Tends to be disorganized
19. _____ Worries a lot
20. _____ Has an active imagination
21. _____ Tends to be quiet
22. _____ Is generally trusting
23. _____ Tends to be lazy
24. _____ Is emotionally stable, not easily upset
25. _____ Is inventive
26. _____ Has an assertive personality
27. _____ Can be cold and aloof
28. _____ Perseveres until the task is finished
29. _____ Can be moody
30. _____ Values artistic, aesthetic experiences
31. _____ Is sometimes shy, inhibited
32. _____ Is considerate and kind to almost everyone
33. _____ Does things efficiently
34. _____ Remains calm in tense situations
35. _____ Prefers work that is routine
36. _____ Is outgoing, sociable
37. _____ Is sometimes rude to others

1 Disagree Strongly	2 Disagree a little	3 Neither agree nor disagree	4 Agree a little	5 Agree strongly
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38. _____ Makes plans and follows through with them
39. _____ Gets nervous easily
40. _____ Likes to reflect, play with ideas
41. _____ Has few artistic interests

I am someone who...

42. _____ Likes to cooperate with others
43. _____ Is easily distracted
44. _____ Is sophisticated in art, music, or literature
45. _____ Tends to be active and energetic
46. _____ Tend to be generous and sympathetic
47. _____ Tends to be organized and responsible
48. _____ Tends to experience negative emotions
49. _____ Tends to have a wide variety of interests

Part II

Here are a number of characteristics that may or may not apply to you. For example, do you agree that you are someone who *is always a perfect friend to others*? If you agree with this statement, then you would circle the word “True” on the line next to that question. Please circle “True” or “False” next to each statement to indicate whether you agree or disagree with each statement.

True or False?

- True or False I never hesitate to go out of my way to help someone in trouble.
- True or False I have never intensely disliked anyone.
- True or False When I don't know something I don't at all mind admitting it.
- True or False I am always courteous, even to people who are disagreeable.
- True or False I would never think of letting someone else be punished for my wrong doings.
- True or False I sometimes feel resentful when I don't get my way.
- True or False There have been times when I felt like rebelling against people in authority even though I knew they were right.
- True or False I can remember “playing sick” to get out of something.
- True or False There have been times when I was quite jealous of the good fortune of others.
- True or False I am sometimes irritated by people who ask favors of me.

Part III

Studies have found that everyone breaks the rules and laws sometimes. Have you done any of the following within the past **12 months**? If yes, please indicate how many times in the past year you have done each thing. For each act that you have done, circle how often you did each act with friends. If you haven't done a particular act, write zero on the line for the number of times and move on to the next question.

How often in the past 12 months have you.....	How often?	How often did you do these things with others?
Purposely damaged or destroyed other property that did not belong to you	_____ Times	1. Never 2. Rarely 3. Sometimes 4. Often 5. Always
Stolen (or tried to steal) a motor vehicle, such as a car or motorcycle	_____ Times	1. Never 2. Rarely 3. Sometimes 4. Often 5. Always
Stolen (or tried to steal) something worth more than \$50	_____ Times	1. Never 2. Rarely 3. Sometimes 4. Often 5. Always
Knowingly bought, sold or held stolen goods (or tried to do any of these things)	_____ Times	1. Never 2. Rarely 3. Sometimes 4. Often 5. Always
Thrown objects (such as rocks or bottles) at cars or people	_____ Times	1. Never 2. Rarely 3. Sometimes 4. Often 5. Always
Lied about your age to gain entrance or to purchase something; for example, lying about your age to buy liquor	_____ Times	1. Never 2. Rarely 3. Sometimes 4. Often 5. Always

How often in the past 12 months have you.....	How often?	How often did you do these things with others?
Carried a hidden weapon	_____ Times	1. Never 2. Rarely 3. Sometimes 4. Often 5. Always
Stolen (or tried to steal) things worth \$5 or less	_____ Times	1. Never 2. Rarely 3. Sometimes 4. Often 5. Always
Attacked someone with the idea of seriously hurting or killing him/her	_____ Times	1. Never 2. Rarely 3. Sometimes 4. Often 5. Always
Been paid for having sexual relations with someone	_____ Times	1. Never 2. Rarely 3. Sometimes 4. Often 5. Always
Been involved in gang fights	_____ Times	1. Never 2. Rarely 3. Sometimes 4. Often 5. Always
Sold marijuana or hashish (“pot”, “grass”, “hash”)	_____ Times	1. Never 2. Rarely 3. Sometimes 4. Often 5. Always
Cheated on school tests	_____ Times	1. Never 2. Rarely 3. Sometimes 4. Often 5. Always

How often in the past 12 months have you.....	How often?	How often did you do these things with others?
Stolen money or other things from your parents or other members of your family	_____ Times	1. Never 2. Rarely 3. Sometimes 4. Often 5. Always
Hit (or threatened to hit) another individual	_____ Times	1. Never 2. Rarely 3. Sometimes 4. Often 5. Always
Been loud, rowdy, or unruly in a public place (disorderly conduct)	_____ Times	1. Never 2. Rarely 3. Sometimes 4. Often 5. Always
Sold hard drugs, such as heroin, cocaine, and LSD	_____ Times	1. Never 2. Rarely 3. Sometimes 4. Often 5. Always
Taken a vehicle for a ride (drive) without the owner's permission	_____ Times	1. Never 2. Rarely 3. Sometimes 4. Often 5. Always
Bought or provided liquor for a minor	_____ Times	1. Never 2. Rarely 3. Sometimes 4. Often 5. Always
Had (or tried to have) sexual relations with someone against their will	_____ Times	1. Never 2. Rarely 3. Sometimes 4. Often 5. Always

How often in the past 12 months have you.....	How often?	How often did you do these things with others?
Used force (strong-arm methods) to get money or things from other people	_____ Times	1. Never 2. Rarely 3. Sometimes 4. Often 5. Always
Avoided paying for such things as movies, bus or subway rides, and food	_____ Times	1. Never 2. Rarely 3. Sometimes 4. Often 5. Always
Been drunk in a public place	_____ Times	1. Never 2. Rarely 3. Sometimes 4. Often 5. Always
Stolen (or tried to steal) things worth between \$5 and \$50	_____ Times	1. Never 2. Rarely 3. Sometimes 4. Often 5. Always
Stolen (or tried to steal) something at school, such as someone's coat from a classroom, or cafeteria, or a book from the library	_____ Times	1. Never 2. Rarely 3. Sometimes 4. Often 5. Always
Broken into a building or vehicle (or tried to break in) to steal something or just to look around	_____ Times	1. Never 2. Rarely 3. Sometimes 4. Often 5. Always
Begged for money or things from strangers	_____ Times	1. Never 2. Rarely 3. Sometimes 4. Often 5. Always

How often in the past 12 months have you.....	How often?	How often did you do these things with others?
Skipped classes without an excuse	_____ Times	1. Never 2. Rarely 3. Sometimes 4. Often 5. Always
Failed to return extra change that a cashier gave you by mistake	_____ Times	1. Never 2. Rarely 3. Sometimes 4. Often 5. Always
Used Alcoholic beverages (beer, wine and hard liquor)	_____ Times	1. Never 2. Rarely 3. Sometimes 4. Often 5. Always
Used Marijuana – hashish (“grass,” “pot,” “hash”)	_____ Times	1. Never 2. Rarely 3. Sometimes 4. Often 5. Always
Used Hallucinogens (“LSD,” “mescaline,” “peyote,” “acid”)	_____ Times	1. Never 2. Rarely 3. Sometimes 4. Often 5. Always
Used Amphetamines (“uppers,” “speed,” “whites”)	_____ Times	1. Never 2. Rarely 3. Sometimes 4. Often 5. Always
Used Barbituates (“downers,” “reds”)	_____ Times	1. Never 2. Rarely 3. Sometimes 4. Often 5. Always

How often in the past 12 months have you.....	How often?	How often did you do these things with others?
Used Heroin (“horse,” “smack”)	_____ Times	1. Never 2. Rarely 3. Sometimes 4. Often 5. Always
Used Cocaine (“coke”)	_____ Times	1. Never 2. Rarely 3. Sometimes 4. Often 5. Always
Used Club Drugs (“ketamine”, “special K”, “ecstasy”)	_____ Times	1. Never 2. Rarely 3. Sometimes 4. Often 5. Always
Used prescription drugs that were not prescribed for you (oxycontin, ritalin, adderal, valium)	_____ Times	1. Never 2. Rarely 3. Sometimes 4. Often 5. Always

Part IV

Please answer all of the following questions. Please answer each as honestly and completely as possible. Please do not skip any of the questions. Circle one answer only for each question or write your answer in the space provided. If you have any questions, be sure to ask.

1. What is your sex?

(1) Male

(2) Female

2. What is your age? _____

3. What is your class level status?

(1) Freshman

(2) Sophomore

(3) Junior

(4) Senior

4. What is your race/ethnicity?

(1) Asian/Pacific Islander

(2) Black/African-American

(3) Caucasian/White

(4) Hispanic/Latino

(5) Native American/Alaskan Native

(6) Other _____

5. What is your grade point average? _____

