Offender and Non-Offender Differences in Empathy, Aggression, Impulsivity and Executive
Functioning: A predictive model

By

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ABSTRACT

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Predictive offender profiling uses present offense details as well as personality and behavior traits to predict past criminal history to better understand criminality and predict future offending. A typical offender profile is characterized as the inability to understand other peoples' emotions and perspectives, tendency to act without thinking, propensity for dealing with adversity through aggression, and deficit in cognitive abilities. There are assumed differences between offenders and non-offenders, but these differences have rarely been studied. The present study examines the differences between 22 male offenders and non-offenders in empathy, impulsivity, aggression, and executive functioning in a sample from the northeastern United States. This study forms an exploratory predictive model that strongly predicts offender status based on physical aggression, empathic concern, and executive functioning scores (χ^2 = 17.15, p = .001). Additionally, this study identifies that executive functioning performance was significantly lower (p = .04) in offenders and physical aggression scores were significantly higher for offenders (p = .04). The assumed differences in verbal aggression, impulsivity, and empathy that did not present as significantly different in the results of this study demonstrate the need for further research and understanding.

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INTRODUCTION

In London, 24 rapes and two murders between the years of 1983 and 1986 had gone unsolved. Through police investigation, it became evident that the crimes were serial rapes and murders committed by two offenders who came to be known as the *railway rapists* (Canter, 1994). For three years the police ran down lead after lead to no avail. Psychologist, David Canter, after reading the front page of the London *Evening Standard*, became exceedingly interested in the case and attempted to find some patterns in the report published in the paper (Canter, 1994). A few months earlier, Canter was approached by two Scotland Yard officers who had heard of his previous research in behavioral analysis; they hoped to develop a collaborative effort between psychology and policing to understand the psychological traces criminals leave behind (Canter, 1994). As a psychologist, Canter was presented a challenge and was excited to attempt to solve serial cases as well as further enhance knowledge in the understanding of causes of violence (Canter, 1994). So, when Canter happened upon the article, he contacted the police force to offer his help (Canter, 1994). As the huge sum of information gathered by the police force was slowly translated into tables, Canter began to recognize patterns (Canter, 1994). Soon graphs, tables, charts, and data covered his walls, and he started to convert the paper data into a computer program that could statistically analyze the significant similarities and differences between the series of rapes and murders (Canter, 1994). Through comprehensive victim interviews, crime scene data, and forensic evaluations, it became clear that one group of crimes was different from the rest (Ainsworth, 2001). Canter hypothesized that this subset of serial rapes were the crimes of one of the rapists (Canter, 1994). He then used psychological principles and statistical analysis to explain patterns within the data. He was able to produce a 17-point profile on the *railway*

rapist. Canter's statistical offender profile departed from the profiling model used by police, and made famous by Sir Arthur Conan Doyle's character Sherlock Holmes, in which profiling is based on guesswork and epiphanies of intuition. Instead, Canter used data and, once analyzed, simply put the conclusions into a form that police could use to supplement their investigation (Ainsworth, 2001). The profile detailed: *Suspect is most likely a light haired, blood group A, right-handed man standing at 5' 9" in his late twenties who has lived within the area of the serial rapes since 1983. Most likely lives with his significant other without children. Has likely been arrested recently with a past history of aggression and intoxication. Works in semi-skilled labor mostly on weekends where he comes in little contact with others, especially women, since at least 1984. He likely tends to keep to himself, has had numerous sexual encounters prior to his first rape, and has detailed knowledge of the railway system* (Canter, 1994).

Canter gave the profile he formed to the police assuming he was providing them information they already knew, but this profile enabled police to limit their large pool of suspects to one: John Duffy, matched 13 points of the 17-point profile (Ainsworth, 2001; Canter, 2015). After conducting surveillance of Duffy, police were able to obtain evidence for an arrest and conviction (Ainsworth, 2001)[1]. Canter's statistical offender profile allowed for police to swiftly identify and incarcerate one of the *railway rapists* before he had the chance to rape and kill again. But, perhaps more importantly, it pioneered new methodologies in the fields of policing and investigative psychology: offender profiling.

Offender profiling is the construction of a personality and behavioral synopsis of an offender based on offense, but it may be more commonly known as criminal profiling,

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[1] Later in 2001, David Mulcahy, the second *railway rapist*, was convicted as the accomplice for seven counts of rape (Ainsworth, 2001).

statistical profiling, psychological profiling and many other terms. Within this thesis the term *offender profiling* is used because the purpose of this study was to identify personality and cognitive factors that distinguish offenders from non-offenders, and in the end this research was also able to develop a model to successfully predict offending with good accuracy. Before scientific methodology was introduced, offender profiling was an attempt to describe personality attributes of offenders based on knowledge gleaned through investigation informed by the professional experience and insight. A more empirically based method was first introduced by the Federal Bureau of Investigation (FBI) in the 1970s (Ainsworth, 2001). The FBI intended to find a way to utilize their behavioral scientists and to better understand offender profiles by creating a profiling system based on agent experience and in-depth interviews with 36 serial murderers (Canter, 1994). Through the interviews and analysis, the FBI was able to identify personality and behavioral traits based on details of their offenses. The main distinction the database makes is between two different categories of serial murderers (Ainsworth, 2001). Knowing details of the offenses, the FBI profiling system sorts offenders into one of these two categories, and many subsequent sub-categories, to create a personality and behavioral profile for serial murderers who have not yet been identified (Ainsworth, 2001). The main criticism of this system, primarily by Canter, is that empirical validity and statistical support is lacking in the FBI model (Ainsworth, 2001; Canter, 1994).

The field of investigative psychology, pioneered and led by Canter, a strong proponent of scientific investigation and empirical methodologies, calls for predictive modeling to support offender profiling (Ainsworth, 2001). All approaches to offender profiling in policing, psychology, investigation, and statistics culminate in predictive offender modeling. The basic assumption of predictive modeling in investigative psychology is that the analysis of multiple

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psychological, behavioral, and offending variables can increase the understanding of the roots of crime and criminal behavior, and also can be used to statistically predict offending (Ainsworth, 2001). Predictive models look at the present to predict the past and to form hypotheses about the future; in terms of offending, predictive models look at current behaviors and personality traits to predict criminal history and future crimes (Foster, Barkus & Yavorsky, 2006). There are two major types of offender profiling: that which use statistical analysis current offense characteristics to predict known criminal history, and that which use personality and behavioral factors to predict criminal history (Scott et al., 2006).

Scott and colleagues (2006), used a stepwise logistic regression model, a statistical analysis that creates a multivariate predictive model, to attempt to use characteristics of stranger rape convictions to predict offenders' criminal histories. The research of Scott and colleagues (2006) was based on similar research conducted by Davies and Dale (1996) who found three predictive models for offenders' criminal histories, the strongest of which used distance travelled from the home of the rapist in stranger rape convictions to predict criminal history; however, Scott and colleagues (2006) were unable to find a predictive models for prior convictions of: burglary or trespassing using stranger rape convictions with elements of intrusion as predictors, prior convictions of property offense using stranger rape convictions with elements of theft, prior convictions of assault and battery using stranger rape convictions with elements of violence, and prior convictions of property and sexual offenses using stranger rape convictions with elements of attempting to remove physical evidence from the crime scene.

Elliot and colleagues (2009) used a stepwise logistic regression model to attempt to use personality traits to predict offenders' criminal histories. More specifically, 505 internet

sex offenders and 526 contact sex offenders completed 15 measures in scales of empathy (Interpersonal Reactivity Index), self-esteem, loneliness, sexual behavior, impulsivity (Barratt Impulsivity), aggression and deceptiveness (Elliot et al., 2009). Researchers found that an increase in scores of perspective taking empathy, empathic concern, aggression, and cognitive impulsivity were predictive of the type of sex offense (Elliot et al., 2009).

Using this same stepwise predictive modeling, the current study investigated whether empathy, impulsivity, aggression, and executive functioning could predict offender status. A typical offender profile was characterized as the inability to understand other peoples' emotions and perspectives, tendency to act without thinking, propensity for dealing with adversity through aggression, and deficit in cognitive abilities. Empathy deficits, impulsivity, aggressive tendencies, and lower executive functioning were all factors that contribute to an individual's likeliness to engage and re-engage in criminal activity. There were assumed differences between offenders and non-offenders, but these differences have rarely been studied.

Empathy is the ability to understand and assume another's emotional responses. Empathy consists of two components: affective empathy and cognitive empathy (Bock & Hosser, 2013). Affective empathy is characterized by autonomic nervous system arousal and is an automatic, physical response to observing or understanding another's emotional response (Bock & Hosser, 2013). Cognitive empathy requires higher cognitive processes and conscious effort to try to understand another's emotional response (Bock & Hosser, 2013). Affective empathy has been repeatedly found to have no relationship with criminal activity, but exhibiting cognitive empathy has been shown to have an inverse relationship with criminal activity (Bock & Hosser, 2013; Miller & Eisenburg, 1988). Empathy is often measured, as it

is in this study, by the Interpersonal Reactivity Index (IRI), which delineates empathy into four subscales: 1) empathic concern for others, 2) personal distress in reaction to tense personal situations, 3) empathic fantasy, or the propensity to take on the feelings of a fictional character, and 4) perspective taking, or the tendency to attempt to possess another's point of view. Empathy drives prosocial behavior and therefore acts as a protective factor from criminal activity. Conversely, an empathic deficit is a risk factor for antisocial behavior, especially concerning violent offenses with a direct victim (Bock & Hosser, 2013). Low ability to empathize with others enable offenders to disassociate with the distress of their victims and the shame and guilt that typically follows criminal activity experienced by someone who falls within the range of normative empathy. Psychopathy and antisocial tendencies are much more prevalent in offenders than in non-offenders (McDermott et al., 2008). These mental disorders, characterized by lack of empathy, have a demonstrated relationship with predatory aggression (McDermott et al., 2008).

Jolliffe and Farrington (2007) examined large portions of psychological research to investigate how empathy and offending correlate in order to better understand why offenders engage in criminal activity. Jolliffe and Farrington (2007) repeatedly found strong positive relationships with empathy and offending behaviors. Jolliffe and Farrington (2007) surveyed 720 adolescents based on self-reported measures of empathy and offending. The boys who self-reported as having offended also reported significantly lower empathy scores, but this inverse relationship between offending and empathy was not demonstrated in the surveyed girls (Jolliffe & Farrington, 2007). Further, researchers investigated whether the empathy scores were also related to offense characteristics and found that, in only boys, those who reported low empathy were more likely to be more frequent and violent offenders (Jolliffe &

Farrington, 2007).

Bock and Hosser (2014) found the subscales of perspective taking empathy, empathic concern, and fantasy empathy to be moderately inversely related to aggression. Bock and Hosser (2014) conducted a longitudinal study of 748 male offenders to identify if empathy scores on the IRI could predict recidivism. Researchers used a Cox regression model, also known as survival analysis, to see if perspective taking empathy, fantasy empathy, empathic concern, and personal distress empathy could predict recidivism within a five-year follow up period (Bock & Hosser, 2014). Fantasy empathy and perspective taking empathy scores were predictive of the re-offense rate. Offenders who did re-offend and reported lower IRI scores were later found to have recidivated on a violent offense, whereas re-offenders who reported higher scores were found to recidivate on a non-violent offense. Additionally, perspective taking empathy and fantasy empathy scores predicted violent offense recidivism, and low perspective taking empathy scores best predicted violent offending within one year of release (Bock & Hosser, 2014).

Along with lack of empathy for the victim, a lack of inhibition of aggressive impulses is a major factor in offending. Aggression in an incarcerated population is the strongest predictor of recidivism (McDermott et al. 2008). In a 2008 study of 152 male forensic patients, McDermott and colleagues from the California Department of Mental Health found significant relationships between aggression and other psychological factors. Compulsive aggression was positively related to cognitive impulsivity. Predatory aggression was positively related to psychopathic traits, qualities characterized by low empathy. Aggression, when coupled with lack of empathy and inhibition, lends to more likeliness to offend. In addition, it is theorized that deficits in executive functioning, prominent in forensic

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populations, can lead to the inability to inhibit aggressive impulses, which increases potential for violence.

Executive functioning is a set of mental skills that allows one to inhibit impulses, plan, organize, remember, manage time, think creatively, pay attention, and make decisions (DSM-5, 2013). Deficits in executive functioning are present in mental disorders such as Attention-Deficit Disorder, Executive Functioning Disorder, Psychopathy, Anti-Social Personality Disorder, Schizophrenia, Bipolar Disorder, Major Depressive Disorder, Substance Use Disorder, and some Anxiety Disorders (DSM-5, 2013). Low executive functioning leads to decreased impulse control, planning, and emotion regulation, and increased violence potential (DSM-5, 2013). Since correctional facilities are the home of the majority of the American population with these mental disorders, executive functioning deficits are highly represented in incarcerated populations[2]. Offenders, both incarcerated and released, due to low executive functioning, are less likely to inhibit their aggressive impulses.

Verbal aggression and assault and battery charges were found to have a positive relationship to impulsivity (Archer & Webb, 2006). Impulsivity is often measured by the Barratt Impulsivity Scale (BIS-11), which consists of 3 subscales: 1) attentional impulsivity or difficulties concentrating, 2) motor impulsivity, or acting without thinking, and 3) non-planning impulsivity, or lack of self-control (Fields et al., 2015). Impulsivity scores on the

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[2] Comprising only 5% of the world's population, the United States incarcerates 25% of the world's prisoners (Milliken 2008). According to the Treatment Advocacy Center, as of November 2014, 20% of inmates in America suffer from a serious mental illness. About 356,000 prisoners in America have been diagnosed with a psychological disorder, which is ten times more than the number of Americans in state mental institutions. The Bureau of Justice Statistics recidivist study in 2005, followed 404,638 prisoners in the USA across 30 different states after release from correctional facilities and found 67.8% were arrested within 3 years of release, 76.6% were arrested within 5 years of release, and of those who recidivated more than half were arrested within twelve months of their release.

BIS-11 were found to be significantly related to offending, seriousness of crime, risk of recidivism, and executive functioning and empathy deficits (Pechorro et al., 2015). The impulsivity subscales of the BIS-11 have been shown to predict different risks: attentional impulsivity predicts specific outcomes in offending, motor impulsivity predicts general recidivistic risk, and non-planning impulsivity has shown no predictive value in recidivism (Pechorro et al., 2015).

In 1998, researcher Palucka conducted a study to better understand offender and non-offender differences in impulsivity and empathy as they relates to offending. One-hundred six Canadian offenders and non-offenders completed the Questionnaire Measure of Emotional Empathy and the Impulse Expression scale of the Basic Personality Inventory (Palucka, 1998). Offenders were found to be significantly more impulsive than non-offenders, but no difference in empathy was found (Palucka, 1998). This lack of difference in empathy may be explained by lack of support for a relationship between affective empathy and offending, as stated previously, as opposed to a negative relationship between offending and cognitive empathy (Bock & Hosser, 2014). This study by Palucka (1998) is the only research that examined offender and non-offender samples within the same study.

Most research conducted on personality and executive functioning as it relates to offending has compared different types of offenders; for example high and low trait psychopathic offenders. Few researchers have examined differences in risk factors for criminal activity between offenders and non-offenders, as Palucka (1998) did successfully. The limited but existing research on offender and non-offender differences has predominately investigated homogenous western European samples. After a thorough literature review, no comparisons between offender and non-offender samples in empathy, impulsivity, aggression,

or executive functioning have been conducted in the United States. No predictive models within the psychology literature have been attempted or found to predict offender status based on personality or executive functioning. Offender profiling through statistical predictive modeling is a new frontier in policing and investigative psychology (Ainsworth, 2001). In *Offender Profiling and Crime Analysis*, Ainsworth (2001) calls for empirical modeling to supplement and join together the many models of offender profiling across disciplines into a central database of understanding.

The present study examines the differences between offenders and non-offenders in empathy, impulsivity, aggression and executive functioning in an USA population, as well as the relationships between empathy, impulsivity, and aggression with executive functioning as these factors relate to offending. In addition, this study used a forward stepwise logistic regression model as an exploratory form of analysis to form a hypothesis about predictive models of how empathy, impulsivity, aggression, and executive functioning predict offender status.

A Priori Hypotheses:

It is expected that offenders and non-offenders will differ in the following ways:

1. Offenders are expected to report higher aggression scores than non-offenders.

2. Offenders are expected to report higher impulsivity scores than non-offenders.

3. Offenders are expected to report lower empathy scores than non-offenders.

4. Offenders are expected to exhibit lower performance on executive functioning tests than non-offenders.

It is expected that the recidivistic variables will be related to each other in the following ways:

A. Aggression and executive functioning are expected to be inversely related.

B. Empathy and executive functioning are expected to be related.

C. Impulsivity and executive functioning are expected to be inversely related.

Exploratory Hypothesis:

Performance on executive functioning tests is significantly predictive of offender

status, and physical aggression and empathic concern contribute significantly to

predicting offender status.

METHODS

Participants

The sample (n=22) consisted of offenders from the Franklin County Jail, Greenfield, MA, aged 18-35 years and students from Union College, Schenectady, NY, aged 18-22. The offender sample was predominantly Hispanic/Latino, with some identifying African-American and Caucasian. The offender sample was predominantly Caucasian, with some identifying African-American and Hispanic/Latino. All 24 participants were men who volunteered, solicited through a sign-up sheet posted in the correctional facility or on the Sona Systems online recruiting database. From the offender sample, one participant withdrew from the study for personal reasons. Study risks and benefits were reviewed and all study participants signed an informed consent document approved by the Institutional Review Board at Union College (Appendix A)

Procedures

In sample 1, twelve participants volunteered from the education and psychological treatment pod in the Franklin County Jail. Before participating in the study, participants signed an informed consent form. The assessment was administered to eleven participants. The questionnaire portion of the assessment was administered in a group, and the cognitive testing portion of the test was administered individually (Appendix B). Participants were then orally debriefed in a group.

In Study 2, twelve participants volunteered from Union College. Before participating in the study, participants signed an informed consent form. In the informed consent form a cover story was employed to avoid response bias. The cover story explained that the purpose of the study was to assess the relationship between personality and cognitive abilities,

omitting the intent to compare the results to an offender sample. The assessment was administered to twelve participants. The questionnaire and cognitive testing portions of the assessment were administered individually (Appendix B). Participants were then orally debriefed on the true nature of the study and the previous incomplete disclosure.

Measures

All participants were administered an assessment consisting of 73 questions from the Barratt Impulsiveness Scale, the Interpersonal Reactivity Index, and the Buss-Perry Aggression Questionnaire, as well as the VanElst shortened version of the Stroop test, the Digit Span test, and the Color Trails test. The BIS-11, the IRI, and the Buss-Perry Aggression Scales were counterbalanced in order to control for order effects.

Barratt Impulsiveness Scale (BIS-11; Patton et al., 1995). This study used only the BIS-11 cognitive impulsivity subscale consisting of five questions to measure attentional impulsivity, three questions to measure cognitive instability, and five questions to measure cognitive complexity. The BIS-11 cognitive impulsivity subscale consists of thirteen statements that ask the respondent to self-report on a four-point scale with 1 representing "rarely/never," 2 representing "occasionally," 3 representing "often," and 4 representing "almost always/always." Not included in this study were questions from the BIS-11 scales measuring motor impulsiveness, perseverance, and self-control. High reported scores indicate a tendency toward behavior that is cognitively impulsive, and low reported scores indicate a tendency toward controlling and sustaining attention. Adequate reliability and validity has been indicated in prior research (Reise et al., 2013; Stanford et al., 2009).

Interpersonal Reactivity Index (IRI; Davis, 1980). The IRI consists of fantasy empathy, empathic concern, personal distress empathy, and perspective taking empathy

subscales. The fantasy empathy subscale consists of seven statements, which measure the tendency for individuals to experience what fictional characters are feeling. The empathic concern subscale consists of seven statements, which measure the tendency of the individual to sympathize with others in distress. The personal distress subscale consists of seven statements, which measure how uncomfortable an individual feels intense personal situations. The perspective taking subscale consists of seven statements, which measure the tendency for an individual to take on another's perspective. The IRI consists of 28 statements that ask the respondent to self-report on a five-point scale with 1 representing "strongly disagree," 2 representing "disagree," 3 representing "neutral," 4 representing "agree," and 5 representing "strongly agree." The IRI subscales cannot be totaled as they measure separate constructs and do not correlate (Davis, 1980). High reported scores indicate more empathy and low reported scores indicate an empathy deficit. Adequate reliability and validity has been indicated in prior research (Davis, 1980).

   Buss-Perry Aggression Questionnaire (BPAQ; Buss & Perry, 1992).The BPAQ consists of nine questions to measure physical aggression and five questions to measure verbal aggression. The BPAQ consists of 14 questions that ask the respondent to self-report on a five-point scale with 1 representing "strongly disagree," 2 representing "disagree," 3 representing "neutral," 4 representing "agree," and 5 representing "strongly agree." Not included in this study were questions on the BPAQ measuring anger and hostility, because this study focuses on aggressive behaviors and their relation to offending. High reported scores indicate more aggressive tendencies and low reported scores indicate less aggressive tendencies. Adequate reliability and validity has been indicated in prior research (Buss & Perry, 1992).

Stroop (Stroop Task; 40-item version from van Elst, van Boxtel, van Breukelen, & Jolles, 2006), The Stroop task measures how fast individuals can: 1) verbalize the color of colored blocks, 2) read color-words in black ink, and 3) read color-words in colored ink that does not correspond with the color word. For the 1) block trial, 2) word trial, and 3) interference trial, participants completed one practice trial and four timed trials. To measure executive functioning, this study examines the ratio between the time (in seconds) to complete the four block trials to the time (in seconds) to complete the four interference trials. Scored ratios closer to 1 indicate higher executive functioning and scored ratios closer to 0 indicate lower executive functioning. Adequate reliability and validity has been indicated in prior research (van Elst et al., 2006).

Digit Span (Strauss et al., 2006). The Digit Span task measures short-term memory capacity. The first part of the Digit Span task asks the respondent to repeat back strings of digits in the same order as presented. The first part of the test consists of 8 trials each with 2 strings of digits. The trials begin with strings of digits beginning at 2 digits and increase by one with each trial. At the end of the 8 trials, a forward score is calculated based on number of correct recalls and a highest digit forward score is calculated based on the highest number of digits recalled fifty percent of the time. The second part of the Digit Span task asks the respondent to repeat back strings of digits in the reverse order as presented. The second part of the test consists of 7 trials each with 2 strings of digits. The trials begin with strings of digits beginning at 2 digits and increase by one with each trial. At the end of the 7 trials, a backward total score is calculated based on number of correct recalls and a longest digit backward score is calculated based on the highest number of digits correctly recalled fifty percent of the time.

At the end, the total score is calculated by adding the total forward and backward scores. High reliability and validity has been indicated in prior research (Schroeder et el., 2012).

Color Trails (D'Elia, Statz, Uchiyama, & White, 1996). The Color Trails test measures how quickly an individual can connect scrambled colored circles in numerical order according to the number located inside the circle. Both trials include a practice trial and a timed trial. The first trial is a single-task trial that consists of 25 circles of one color, in which individuals are instructed to trace through the circles without lifting the pen in numerical order. The second trial is a dual-task trial that consists of 50 circles of two different colors, in which individuals are instructed to trace through the circles without lifting the pen in numerical order and also switch between the two colors. The test is scored based on time to complete each trial in seconds. A high score on Color Trails Trial 2 indicates low executive functioning; a low score on Color Trails Trial 2 indicates high executive functioning. Adequate reliability and validity has been indicated in prior research (Strauss, Sherman, & Spreen, 2006).

Statistical Analysis

Data recorded was analyzed using Microsoft Excel and the Statistical Package for the Social Sciences (SPSS v. 12.0). Independent samples t-tests were conducted to evaluate offender and non-offender differences in empathy, impulsivity, aggression and executive functioning specified in the priori hypotheses 1-4 previously mentioned.

Pearson's correlations were conducted to evaluate relationships between recidivistic factors specified in the priori hypotheses A-C previously mentioned. A correlation matrix was created to demonstrate the strength of the correlation coefficients of recidivistic personality variables and executive functioning (Table 2).

A forward stepwise logistic regression was performed to assess what explains variability in offender status to form the exploratory hypothesis previously mentioned. The stepwise model creates a predictive model analyzing and permitting evaluation of multiple recidivistic variables simultaneously (Foster, Barkus, & Yavorsky, 2006). The stepwise analysis enters one predictive recidivistic variable at a time and rejects the variable from the model if it does not significantly add predictive value to assess offender status within the model (with p-value set at .05; Keppel & Zedeck, 1989). All recidivistic variables could be rejected at any point in analysis if a following variable could better predict offender status. The stepwise model is not the most ideal model to assess prediction; however it is the best model available to researchers that allowed for interpretation of non-dichotomous independent variables to form exploratory hypotheses with a small sample size (Aitken, 1997;Bock & Hosser, 2013; Canter, 1994; Eye & Schuster, 1998; Foster, Barkus, & Yavorsky, 2006; Scott et al., 2006). While other models, such as survival and Bayesian analyses, may have been a valid form of analysis, more validation needs to occur within the field of investigative psychology (Canter, 1994; Scott et al., 2006). The stepwise procedure is internationally recognized and empirically supported as a valid and effective form of predictive modeling in criminal profiling research (Canter, 1994; Davies & Dale, 1996; Scott et al., 2006).

RESULTS

Out of the total 24 participants recruited, 11 college student non-offenders and 11 offenders completed the study. The offender dropout did not complete the study because of personal issues and the non-offender assessment was omitted due to an incomplete Stroop task. All participants were men from either Union College or Franklin County Jail, with ages ranging from 18-35.

A Priori Hypothesis 1:

Offenders, on average, reported higher total aggression scores than non-offenders (Table 1). An independent samples t-test performed on the total aggression scores revealed no significant difference between offenders and non-offenders, $t(20) = -1.85$, $p = .08$. Offenders, on average, reported higher physical aggression scores than non-offenders (Table 1 & Figure 1). An independent samples t-test performed on the physical aggression scores revealed a significant difference between offenders and non-offenders, $t(20) = -2.17$, $p = .04$. Offenders, on average, reported higher verbal aggression scores than non-offenders (Table 1). An independent samples t-test performed on the verbal aggression scores revealed no significant difference between offenders and non-offenders, $t(20) = -0.85$, $p = .40$.

A Priori Hypothesis 2:

Non-offenders, on average, reported higher total impulsivity scores than offenders (Table 1). An independent samples t-test performed on the total impulsivity scores revealed no significant difference between offenders and non-offenders, $t(20) = 0.62$, $p = .54$. Non-offenders, on average, reported higher attentional impulsivity scores than offenders (Table 1). An independent samples t-test performed on the attentional impulsivity scores revealed no significant difference between offenders and non-offenders, $t(20) = 1.42$, $p = .17$. Offenders, on average, reported higher cognitive complexity impulsivity scores than non-offenders (Table 1). An independent samples t-test performed on the cognitive complexity impulsivity scores revealed no significant difference between offenders and non-offenders, $t(20) = -0.09$, $p = .92$. Offenders, on average, reported higher cognitive instability impulsivity scores than non-offenders (Table 1). An independent samples t-test performed on the cognitive instability

impulsivity scores revealed no significant difference between offenders and non-offenders, t(20) -0.31, p = .76.

A Priori Hypothesis 3:

Offenders, on average, reported lower empathic concern scores than non-offenders (Table 1). An independent samples t-test performed on the empathic concern scores revealed no significant difference between offenders and non-offenders, t(20) = -0.86, p = .40. Offenders and non-offenders, on average, reported the same fantasy empathy scores (Table 1). An independent samples t-test performed on the fantasy empathy scores revealed no significant difference between offenders and non-offenders, t(20) = 0.14, p = .88. Non-offenders, on average, reported higher personal distress empathy scores than offenders (Table 1). An independent samples t-test performed on the personal distress empathy scores revealed no significant difference between offenders and non-offenders, t(20) = 0.85, p = .41. Offenders, on average, reported higher perspective taking empathy scores than non-offenders (Table 1). An independent samples t-test performed on the perspective taking empathy scores revealed no significant difference between offenders and non-offenders, t(20) -1.97, p = .06.

A Priori Hypothesis 4:

Offenders, on average, took longer to complete the Color Trails 2 than non-offenders (Figure 1 & Figure 2). An independent samples t-test performed on the time (in seconds) to complete the Color Trails 2 revealed a significant difference between offenders and non-offenders, t(20) = -0.20, p = 0.05. Non-offenders, on average, scored higher on total score of the Digit Span task than offenders (Table 1). An independent samples t-test performed on the total scores on the Digit Span task revealed no significant difference between offenders and non-offenders, t(20) = 0.14, p = 0.05. Non-offenders, on average, had higher ratio scores of

backward score to forward score of the Digit Span task than offenders (Table 1). An

independent samples t-test performed on ratio scores of backward score to forward score of

the Digit Span task revealed no significant difference between offenders and non-offenders,

$t(20) = 0.38$, $p = 0.05$. Non-offenders, on average, had higher ratio scores of time (in seconds)

to complete the block trial to time (in seconds) it took to complete the interference trial of the

Stroop task than offenders (Table 1). An independent samples t-test performed on ratio scores

of time (in seconds) to complete the block trial to time (in seconds) it took to complete the

interference trial of the Stroop task revealed no significant difference between offenders and

non-offenders, $t(20) = 1.49$, $p = 0.05$.

A Priori Hypothesis A:

A Pearson's correlation performed between the total aggression scores and ratio scores

of time (in seconds) to complete the block trial to time (in seconds) it took to complete the

interference trial of the Stroop task revealed a significant negative correlation (Table 2 and

Figure 3). A Pearson's correlation performed between the verbal aggression scores and ratio

scores of time (in seconds) to complete the block trial to time (in seconds) it took to complete

the interference trial of the Stroop task revealed a significant negative correlation (Table 2 and

Figure 4). A Pearson's correlation performed between the physical aggression scores and ratio

scores of time (in seconds) to complete the block trial to time (in seconds) it took to complete

the interference trial of the Stroop task revealed a significant negative correlation (Table 2 and

Figure 5). A Pearson's correlation performed between the verbal aggression scores and time

(in seconds) to complete the Color Trails trial 2 revealed a significant positive correlation

(Table 2 and Figure 6). A Pearson's correlation performed between the physical aggression

scores and ratio scores of backward score to forward score of the Digit Span task revealed a

significant positive correlation (Table 2 and Figure 7).

A Priori Hypothesis B:

Pearson's correlations performed between the subscales of the IRI scores and ratio

scores of time (in seconds) to complete the block trial to time (in seconds) it took to complete

the interference trial of the Stroop task revealed no significant correlations (Table 2).

Pearson's correlations performed between the subscales of the IRI scores and ratio scores of

backward score to forward score of the Digit Span task revealed no significant correlations

(Table 2). Pearson's correlations performed between the subscales of the IRI scores and time

(in seconds) to complete the Color Trails trial 2 revealed no significant correlations (Table 2).

A Priori Hypothesis C:

Pearson's correlations performed between the total impulsivity scores and ratio scores

of time (in seconds) to complete the block trial to time (in seconds) it took to complete the

interference trial of the Stroop task revealed no significant correlations (Table 2). Pearson's

correlations performed between the total impulsivity scores and ratio scores of backward

score to forward score of the Digit Span task revealed no significant correlations (Table 2).

Pearson's correlations performed between the total impulsivity scores and time (in seconds) to

complete the Color Trails 2 revealed no significant correlations (Table 2).

Exploratory Hypothesis:

A forward stepwise logistic regression analysis was performed with offender status as

the dependent variable, and time to complete (in seconds) the Color Trails 2, physical

aggression scores, and empathic concern scores as predictor variables. The stepwise analysis

revealed three significant models. The first resulting model using time to complete (in

seconds) the Color Trails 2 as the predictor of offender status was significantly reliable, χ^2 (1) = 4.85, p = .03, and the overall accuracy of the table was 72.7%, with 81.3% of the non-offenders and 63.6% of the offenders being correctly classified. In the first model, a one-unit increase in scores was associated with increased odds of offending on the time it took to complete (in seconds) the Color Trails 2, exp(b) = 1.05. The second resulting model using time to complete (in seconds) the Color Trails 2 and physical aggression as the predictor of offender status was significantly reliable, χ^2 (2) = 10.68, p = .005, and the overall accuracy of the table was 77.3%, with 81.8% of the non-offenders and 72.7% of the offenders being correctly classified. In the second model, a one-unit increase in scores was associated with increased odds of offending on the physical aggression scale, exp(b) = 1.32; and the time it took to complete (in seconds) the Color Trails 2, exp(b) = 1.07. The third resulting model using time to complete (in seconds) the Color Trails 2 and physical aggression as the predictor of offender status was significantly reliable, χ^2 (3) = 17.15, p = .001, and the overall accuracy of the table was 86.4%, with 90.9% of the non-offenders and 81.8% of the offenders being correctly classified. In the third model, a one-unit increase in scores was associated with increased odds of offending on the empathic concern scale, exp(b) = 1.66; the physical aggression scale, exp(b) = 1.80; and the time it took to complete (in seconds) the Color Trails 2, exp(b) = 1.14.

DISCUSSION

A Priori Hypotheses:

Eleven offenders and 11 non-offenders' empathy, aggression, and impulsivity scores, and performance on the Stroop, Digit Span, and Color Trails were compared and identified significant differences in the scores on the physical aggression scale and performance on the Stroop. After comparing the tested empathy, impulsivity, aggression, and executive

functioning of offenders and non-offenders, significant differences were found in physical aggression and executive functioning, but no significant differences were found in verbal aggression, empathy, and impulsivity. More specifically, offenders reported higher physical aggression and exhibited lower performance on the Color Trails 2 than non-offenders. The significant differences between offenders and non-offenders from the physical aggression subscale on the BPAQ indicate that offenders report higher physical aggression, thus supporting hypothesis 1; however, no significant differences were found in verbal aggression (hypothesis 1). The significant difference between offenders and non-offenders in performance on the Color Trails 2 supported a portion of hypothesis 4, which expected that offenders' performance on executive functioning tasks would be lower than that of non-offenders', as indicated by the significant differences in performance on the Digit Span Task; however, no significant differences were found in executive functioning in either the Stroop or Digit Span tasks (hypothesis 4). No significant differences in impulsivity or empathy were found between offenders and non-offenders to support hypotheses 2 and 3.

A significant inverse relationship was found between aggression and executive functioning in support of hypothesis A. The results did not support any significant relationships between impulsivity or empathy and executive functioning (hypotheses B and C).

Exploratory Hypothesis:

The results demonstrated three significant models to predict offender status. The model which most strongly predicts offender status, uses time to complete (in seconds) the Color Trails 2, empathic concern scores, and physical aggression scores as the predictors. In this model, when controlling empathic concern scores and time to complete (in seconds) the

Color Trails 2, aggression is the most predictive factor. In the most significant model, a one-point increase in empathic concern scores predicted men to be 1.66 times more likely to be an offender. Also, a one-point increase in physical aggression scores predicted men to be 1.80 times more likely to be an offender. Also, an increase by one second in the time it took to complete (in seconds) the Color Trails 2 predicted men to be 1.14 times more likely to be an offender.

Strengths

This study found three significant predictive models for offender status based on executive functioning, aggression, and empathy, as well as investigated offender and non-offender differences in a wide variety of important recidivistic factors and how the factors relate to each other. Similar statistical modeling has compared different types of offenders, but such statistical modeling and recent comparisons between offenders and non-offenders are absent in psychological literature.

The research protocol was kept as uniform as possible by using a written script (Appendix B). Also, only men were compared, and all participants were put with a similar female researcher to improve control of potential confounds. The predictive models and significant differences between offenders and non-offenders are original and clarifying, but the findings with no significant differences in empathy, verbal aggression, and impulsivity call for further investigation and theory.

Limitations

The study had a small number of participants due to the difficulty of recruiting offender participants because of limited, restrictive access to the jail population. The study

was only comprised of male offenders because the correctional facility was a male-specific facility. Additionally, the study relied on self-report measures for the personality scales.

A selection bias is also present in both samples. Offenders were only selected if they volunteered for the study on a sign-up sheet and non-offenders, as well, volunteered to take the study and the first twelve to sign up were the participants included in the study.

The non-offender sample was comprised of male college students, which would most likely be very different than a random sample of 18-35 year old men. A major confound in this study was level of education, as offenders ranged from having completed some high school to having their GED, and non-offenders ranged from having completed three months of college to 30 months of college. Other confounds that may explain differences in physical aggression and executive functioning could be residential culture differences between a correctional facility and a college campus, as well as socioeconomic status.

Another major limitation in this study, and also the greater field of criminal research, is that this study only includes offenders who are incarcerated and convicted. Offenders who have been arrested and convicted likely differ greatly from criminals who go without conviction or suspicion.

The only offenders for which participation was permitted were offenders currently placed in the treatment pod, which meant they were well-behaved and willing to engage in education and treatment. Within the jail, if offenders are in the treatment pod they are engaged in dialectical behavioral therapy (DBT) and educational programming and classes. DBT is a cognitive behavioral treatment, which teaches behavioral skills with a focus on mindfulness, psychological distress tolerance, maintaining respect for self and others, and emotion regulation (Linehan, 2015). This treatment teaches perspectives taking, decision making, and

controlling emotions, which are all components of empathy and executive functioning. Also, studies have found that DBT significantly decreases aggression and impulsivity (Frazier & Vela, 2014; Panepinto et al., 2015). Since all offenders within this sample were engaged in DBT treatment, their reported empathy, impulsivity, aggression, and executive functioning scores were likely affected, and therefore not representative of a normal offender sample. The DBT treatment could explain why an increase in empathic concern scores predicted men to be more likely to be classified as an offender. The scores presented may not be predictive or significantly different may be because this offender sample was being taught to be more empathic, less aggressive, and less impulsive, and being taught to improve executive functioning skills. The predictive model could, in a group of offenders not enrolled in DBT treatment, be even more predictive than the analysis on this sample shows.

Future Research

Empathy, impulsivity, aggression, and executive functioning are all recognized as recidivistic factors. This study found verbal aggression and executive functioning to be different between offenders and non-offenders. The expected differences between offenders and non-offenders in empathy, impulsivity, and physical aggression were non-significant, possibly be due to limitations of self-report and DBT treatment. More research needs to be done to better understand differences in empathy, impulsivity, and physical aggression in offenders and non-offenders. Future research should compare a more normative sample of non-offenders with an offender group not enrolled in DBT treatment. Further replication of the current study and examination of offender and non-offender differences and potential prediction models is necessary prior to coming to firm conclusions.

The aim of investigative psychology is, through theory, hypothesis testing, and careful analysis of data, to better understand, predict, and profile criminality and criminal behavior. As Canter (2015) states,

> The stage in an investigation that a psychologist should be brought in…is before the crime is committed, in other words it's the way you think about the criminal activity, the way the police are trained, how they collect their information, how they carry out interviews all those sorts of processes, which is what investigative psychology is about…the importance of developing systems and statistical frameworks that will contribute to the whole investigative process.

More predictive modeling between offenders and non-offenders needs to be extensively researched in order to better understand the social and psychological profile of an offender. Once established, further predictive analysis should be conducted to differentiate between offender types. Cognitive and personality testing all incarcerated offenders would allow psychologists to have access to enough information to create significant and impactful predictive model for offender status, recidivism, and criminal histories, which could be used to create a profiling system and greatly impact policing efforts. Additionally, longitudinal predictive validation studies should be conducted to test predictive offender models. This research should be an interdisciplinary effort to create a central database for police, researchers, and investigators alike to add to and draw from, to simultaneously further investigative psychology research and offender profiling attempts.

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Table 1. The offender and non-offender differences.

Variable	Offender		Non-Offender		t-test
	mean	SD	mean	SD	
Aggression Total	40.41	9.70	34.18	5.65	t(20) = -1.84; p = .08
Physical Aggression	25.32	6.20	20.45	4.13	t(20) = -2.17; p = .04*
Verbal Aggression	15.09	4.44	13.72	2.90	t(20) = -0.85; p = .40
Empathy					
Empathic Concern	27.55	4.13	26.00	4.65	t(20) = -0.86; p = .40
Fantasy Empathy	23.36	4.13	23.64	4.74	t(20) = 0.14; p = .88
Personal Distress	16.36	3.23	17.82	4.69	t(20) = 0.85; p = .41
Perspective Taking	25.73	3.58	22.18	4.77	t(20) = -1.97; p = .06
Impulsivity Total	28.68	6.46	30.18	4.71	t(20) = 0.62; p = .54
Attentional Impulsivity	10.14	3.02	12.09	3.42	t(20) = 1.42; p = .17
Cognitive Complexity	11.00	1.73	10.91	2.81	t(20) = -0.09; p = .92
Cognitive Instability	7.55	3.59	7.18	1.60	t(20) = -0.31; p = .76
Color Trails					
Color Trails 2	76.65	26.99	54.99	18.29	t(20) = -0.16; p = .04*
Digit Span					
Digit Span Ratio	0.70	0.24	0.74	0.13	t(20) = 0.38; p = .71
Stroop					
Stroop Ratio	0.61	0.12	0.69	0.14	t(20) = 0.56; p = .15

Example: * p < 0.05, **p < 0.01

Table 2. The correlations between personality variables and executive functioning.

Variable	Color Trails 2	Digit Span Ratio	Stroop Ratio
Aggression Total	0.32	0.15	-0.57**
Physical Aggression	0.15	0.51*	-0.52*
Verbal Aggression	0.50*	0.89	-0.49*
Empathic Concern	0.08	-0.24	0.19
Fantasy Empathy	0.22	-0.03	0.01
Personal Distress	0.00	0.20	0.03
Perspective Taking	0.37	-0.17	0.12
Impulsivity Total	-0.05	0.16	-0.18
Attentional Impulsivity	-0.13	0.09	-0.17
Cognitive Complexity	0.02	0.13	-0.14
Cognitive Instability	0.05	0.12	-0.05

Example: * $p < 0.05$, **$p < 0.01$

Figure 1. Mean offender and non-offender differences in physical aggression.
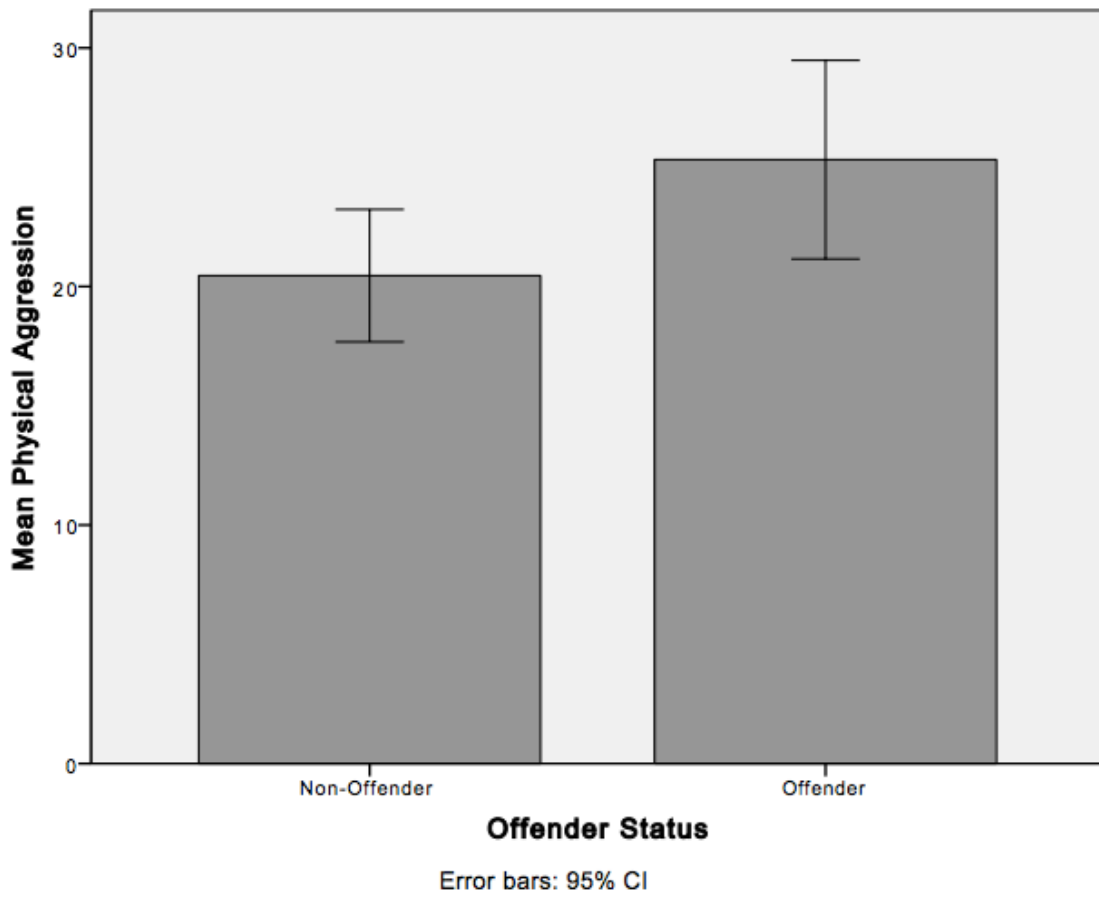
Figure 2. Mean offender and non-offender differences in color trails 2 performance.
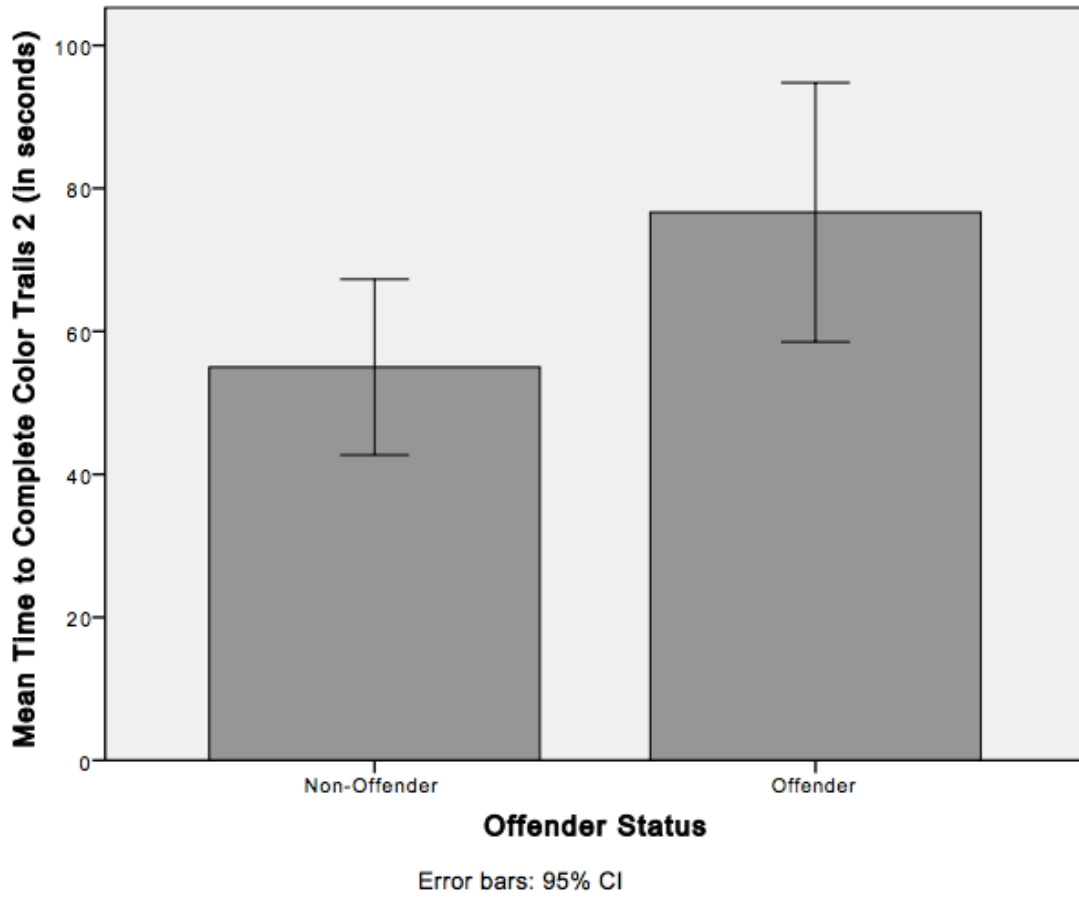
Figure 3. Correlation between total aggression scores and stroop ratio scores.
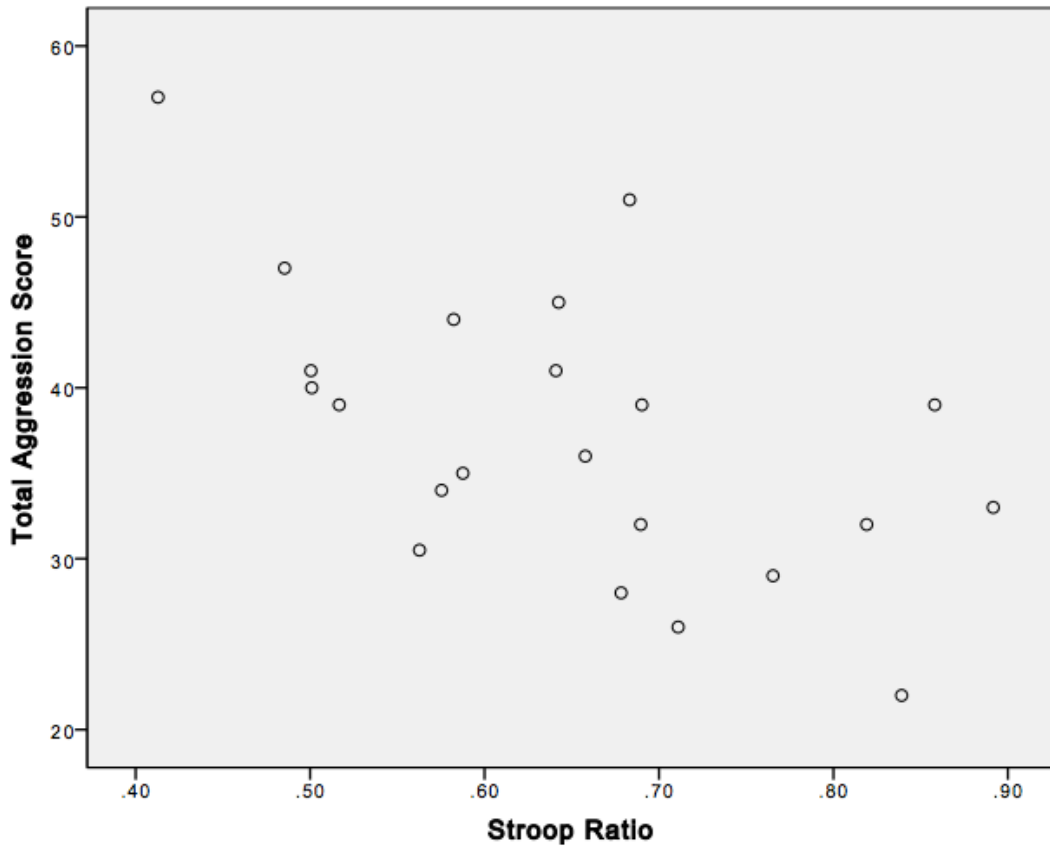
Figure 4. Correlation between verbal aggression scores and stroop ratio scores.
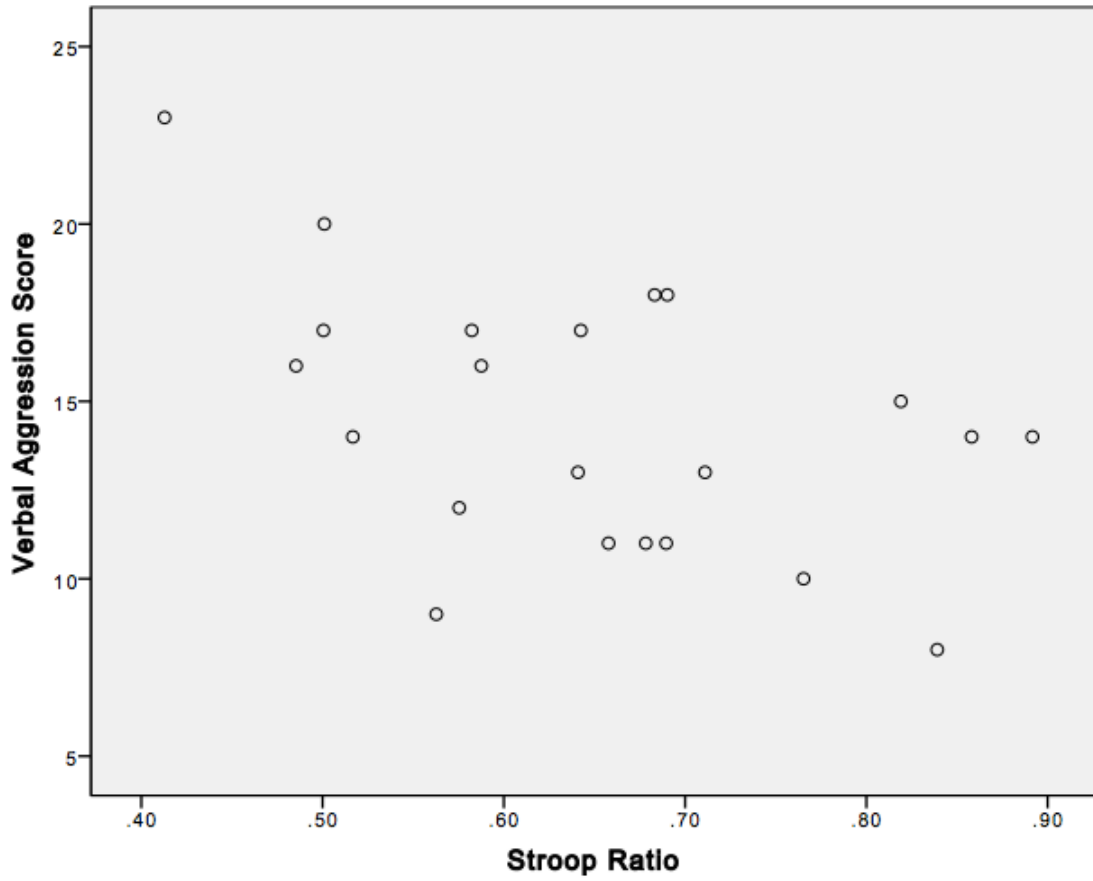
Figure 5. Correlation between physical aggression scores and stroop ratio scores.
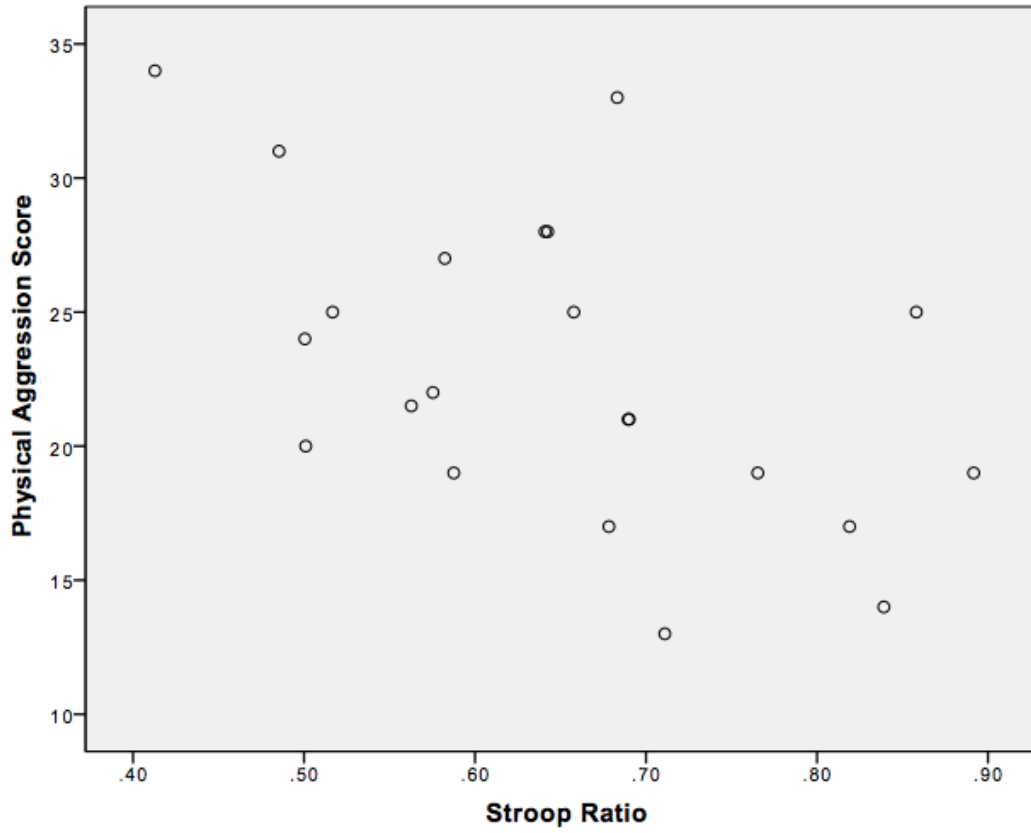
Figure 6. Correlation between verbal aggression scores and color trails trial 2 performance.
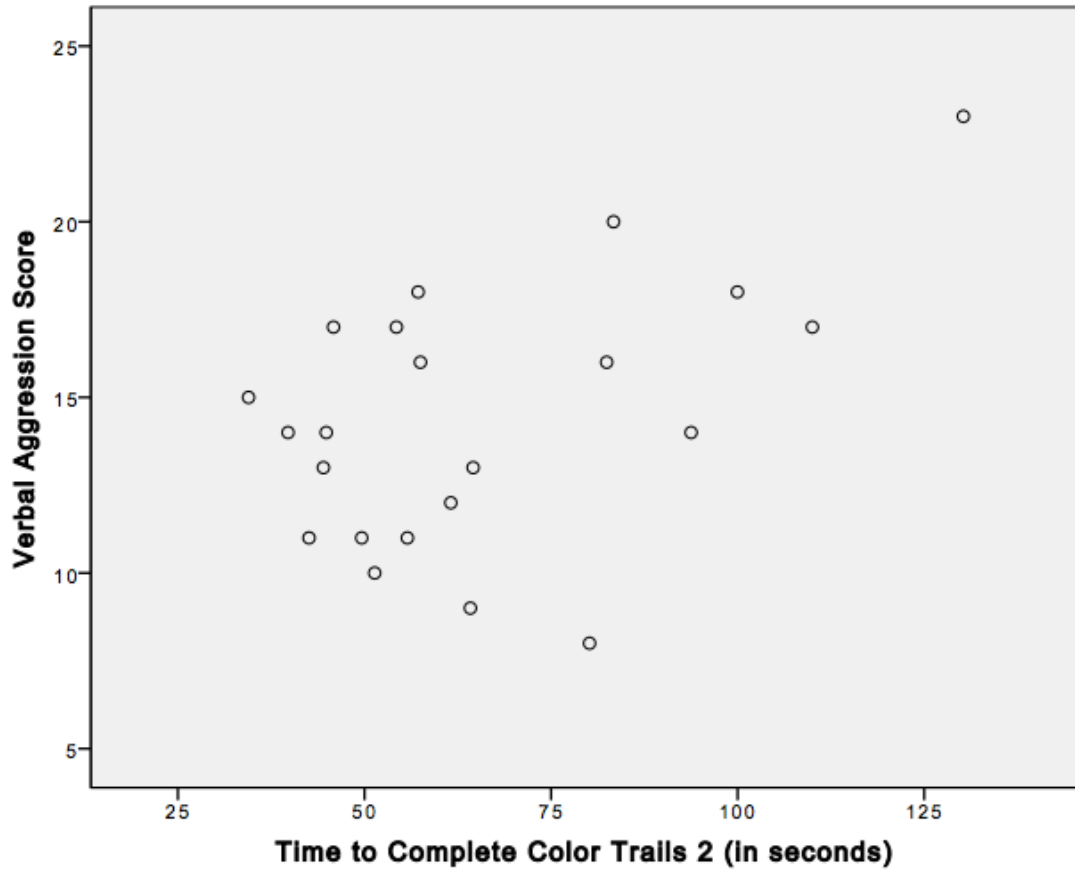
Figure 7. Correlation between physical aggression scores and digit span ratio scores.
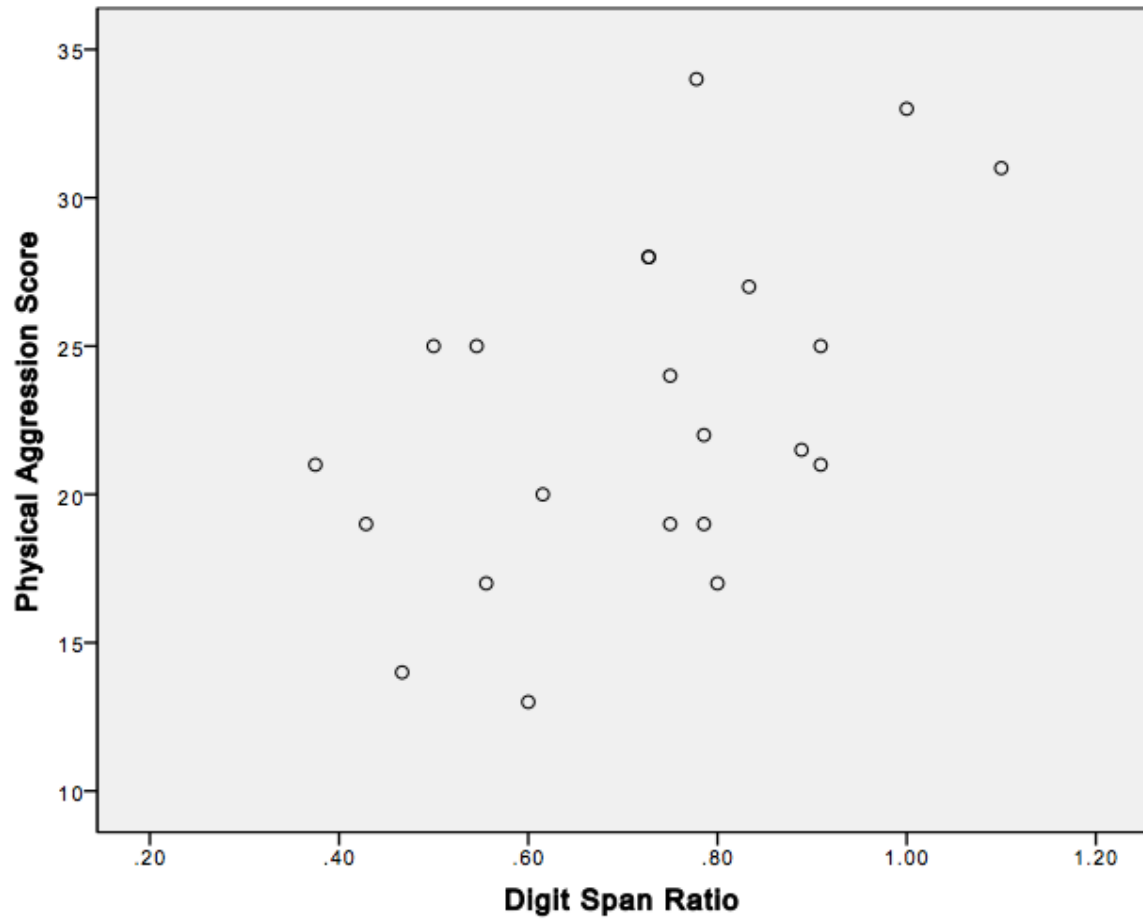
Figure 8. Forward stepwise logistic regression predictive model.

```
          Step number: 3

          Observed Groups and Predicted Probabilities

      4 +                                                                    +
        I                                                                    I
        I                                                                    I
F       I                                                                    I
R     3 +N                                                                   +
E       IN                                                                   I
Q       IN                                                                   I
U       IN                                                                   I
E     2 +N N                                                    O         O+
N       IN N                                                    O         OI
C       IN N                                                    O         OI
Y       IN N                                                    O         OI
      1 +N N    N    N         N      NO   O    N          O         O    N  OO O   OO+
        IN N    N    N         N      NO   O    N          O         O    N  OO O   OOI
        IN N    N    N         N      NO   O    N          O         O    N  OO O   OOI
        IN N    N    N         N      NO   O    N          O         O    N  OO O   OOI
Predicted ---------+---------+---------+---------+---------+---------+---------+---------+---------+----------
   Prob:   0       .1        .2        .3        .4        .5        .6        .7        .8        .9        1
   Group:   NNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOO

          Predicted Probability is of Membership for Offender
          The Cut Value is .50
          Symbols: N - Non-Offender
                   O - Offender
          Each Symbol Represents .25 Cases.
```

APPENDIX A

My name is Maddison Stemple-Piatt and I am a student at a Union College. I am inviting you to participate in a research study. Involvement in the study is voluntary, so you may choose to participate or not. A description of the study is written below.

I am interested in studying the relationship between cognitive functioning and personality. You will be asked to fill out a questionnaire asking a series of questions about your personality and complete three tasks assessing cognitive functioning. This will take approximately one hour. If you no longer wish to continue, you have the right to withdraw from the study, without penalty, while still receiving compensation at any time.

Your responses will be held confidential but not anonymous. With few exceptions, the researcher promises not to divulge this information. All information you give will be marked with an identification code, not your name. This ensures your confidentiality. Your name and identification number will not be linked by a document.

By signing below, you indicate that you understand the information above, and that you wish to participate in this research study.

Participant Signature	Printed Name	Date

APPENDIX B

Protocol Instructions

Participant ID# _____   Date _____
                                        Time (please note am or pm too) _____

Psychological Assessment of Empathy, Aggression, Impulsivity, and Cognitive Ability
"Offender and non-offender differences in personality and cognitive abilities"

_____ Pre-session check-list:

        _____ Consent form, Protocol, Stroop test sheet
        _____ Assessment, Color Trails 1 & 2, Stroop scoring sheet, Digit Span, and Demographics sheet
        _____ Clipboard, Stopwatch, 2 pens

_____ Welcome participant to the study and ask that they read and fill out informed consent form

_____ Go over informed consent (answer any Qs, have them sign copy for lab)

_____ Administer BIS-11, Buss-Perry Aggression Questionnaire, and Davis Empathy Scale.

_____ Administer Color Trails

PRACTICE: Color Trails 1-A
In this box are different colored circles with numbers in them. When I say "begin," I want you to take this pen and connect the circles by going from 1 *(point to the 1),* **2** *(point to the 2),* **3** *(point to the 3)***, and so on, until you reach the end. I want you to connect the circles in the correct order as quickly as you can, without lifting the pen from the paper. If you make a mistake, I will point it out. When I do, I want you to move the pen back to the last correct circle and continue from there. The line that you draw must go through the circles and must do so in the correct order. Do you have any questions? Okay, let's practice. Put your pen here where this hand tells you to start. When I say "begin," connect the circles in order as quickly as you can until you reach the circle next to the hand telling you to stop. Ready? Begin.** *(Begin timing as soon as you detect movement toward the first circle.)*

 TEST: Color Trails I-A
Now I have a sheet with several more numbers and circles. Connect the circles in order like you did just a moment ago. Again, work as quickly as you can, and do not lift the pen from the paper as you go. Make sure that your lines touch the circles. *Point to the first circle and say the following:* **You will start here, where the hand tells you to start, and end where the hand tells you to stop. Ready? Begin.** *(Begin timing as soon as you detect movement toward the first circle. Be sure to record # of dot just completed at 60 seconds, as well as time to complete all).*

Record circle color and number at 60 seconds: _____

Record time to complete (in seconds): _____

 PRACTICE: Color Trails II-A
In this box are different colored circles with numbers in them. This time I want you to take the pen and connect the circles in order by going from *this* color 1 *(point to the pink 1)***, to *this* color 2** *(point to the yellow 2)***, to *this* color 3** *(point to the pink 3)***, and so on, until you reach the last number next to the hand telling you to stop.** *Take the pen and point to the example below the box as you say the following:* **Notice that the color changes each time you go to the next number. I want you to work as quickly as you can. Do not lift the pen from the paper once**

you have started. If you make a mistake, I will point it out. When I do, I want you to move the pen to the last correct circle and continue from there. As before, the line you draw must go through the circles in the correct order. Do you have any questions? Okay, let's practice. Put your pen here next to the hand telling you to start. When I say "begin," connect the circles in order as quickly as you can, changing from one color to the next, until you reach the hand telling you to stop, Ready? Begin. *(Begin timing as soon as you detect movement toward the first circle.)*

TEST: Color Trails II-A
Now I have a sheet with several more numbers and colored circles. Connect the circles like you did just a moment ago. Again, work as quickly as you can. *Point to the first circle and say the following:* **You will start here, where the hand tells you to start, and end where the hand tells you to stop. Ready? Begin.** *(Begin timing as soon as you detect movement toward the first circle. Be sure to record # of dot just completed at 60 seconds, as well as time to complete all).*

Record circle color and number at 60 seconds: _____

Record time to complete (in seconds): _____

_____   Administer Stroop Task (PROSPER version – 40 items)

Before showing the examinee any of the cards, say:

COLOR BLOCKS:
I am going to show you a few different pages. On this first page, there are some colored blocks. Please tell me the names of the colors you see on this top, sample row (point to the row)**.**

If necessary, clarify that the names to use are: red, blue & green. If the examinee cannot distinguish the colors, perhaps due to color-blindness, move on to the next task. If the examinee completes the sample line successfully, say:

Good. Now I want you to tell me the names of each color block starting here and going as quickly as you can, without making mistakes, across the row and down to the next line and across, etc., until you finish all the rows (point to the end)**. Are you ready? Go.** (Be sure to start & stop the timer precisely. Mark all answers on your record sheet so that you can tally the number of errors later. Examinee can self-correct, but do not prompt for corrections)**.**

BLACK WORDS:
Ok good, on the next page you will see that the task is similar, but slightly different. Here, read the words as quickly as you can. Please try the sample line (point)**.**

Fine. Now I want you to start here (point) **and read across as quickly as you can without making mistakes. Again, go across each row and then down until you finish all the rows** (point to the end)**. Are you ready? Go.**

COLORED WORDS (incongruous/interference):
Good. On this last page, your task is to tell me the color of the ink and ignore the written word. (Feel free to empathize if the examinee laughs, gasps, etc. – e.g., say something like: **I realize this is getting more challenging, but do the best you can). Please try the sample line.**

Fine. *(If not, please explain again and repeat practice until clear understands, or abandon task).* **Start here** (point) **and read across and then down as quickly as you can without making mistakes until the end** (point)**. Are you ready? Go.**

_____ Administer Digit Span

> DIGITS FORWARD
> Good. On this last page, your task is to tell me the color of the ink and ignore the written word. **(Feel free to empathize if the examinee laughs, gasps, etc. – e.g., say**
>
> **I am going to say some numbers. Then when I am through, I want you to repeat them right after me. For example, if I say 8-9 you will say 8-9. You'll just say exactly what I say.**
>
> DIGITS BACKWARD
> *Read numbers at rate of one second per number, with downward intonation at end. Be sure to record <u>all</u> responses whether right or wrong. Discontinue after 2 failures of the same length of digits.*
>
> **Now I am going to say some more numbers. But this time when I stop, I want you to say them backward. For example, if I say 7-9, what would you say?**

_____ Administer Demographics Questionnaire

_____ IF STUDENT Ask if the participant would like to receive "Cash or credit" and then give them the debrief sheet and properly compensate

_____ IF OFFENDER orally debrief