12-21-2009

Predicting Recidivism in Adolescent Males Using the Minnesota Multiphasic Personality Inventory – A and the Trauma Symptom Checklist for Children

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Predicting Recidivism in Adolescent Males Using the Minnesota Multiphasic Personality Inventory – A and the Trauma Symptom Checklist for Children

Abstract
Small subsets of first-time criminal offenders go on to commit additional crimes. For some, the number of crimes committed can be quite great. It is believed to be the case that a small group of “recidivists” commits a majority of crime. A number of methods to detect who is likely to recidivate have been suggested, but there is no present consensus as to a best method. As recidivism is a low base-rate event, it is difficult to predict. A brief overview of these methods is provided. Then, a novel method for detecting recidivism is outlined and examined. In this method one determines cut-offs based on Minnesota Multiphasic Personality Inventory-A K-Scale (MMPI-A) and the Trauma Symptom Checklist for Children post Traumatic Stress Scale (TSCC) are used to predict recidivism. It is suggested that the MMPI-A K-Scale measures not only defensiveness but also ego-strength and openness to treatment. It is further suggested that those with poor ego-strength or who are overly defended, with the presence of unresolved trauma (as measured by the TSCC PTS scale), are more likely to recidivate. Results indicate that this method does not map well to a linear model, but that it is an effective method to detect recidivism in this sample. A comparison to other similar methods is provided and the ramifications and limitations of this study are discussed.

Degree Type
Dissertation

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PREDICTING RECIDIVISM IN ADOLESCENT MALES USING THE MINNESOTA MULTIPHASIC PERSONALITY INVENTORY – A AND THE TRAUMA SYMPTOM CHECKLIST FOR CHILDREN

A DISSERTATION
SUBMITTED TO THE FACULTY
OF
SCHOOL OF PROFESSIONAL PSYCHOLOGY
PACIFIC UNIVERSITY
HILLSBORO, OREGON

BY
MIGUEL KELLER HIDALGO-BARNES
IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF
DOCTOR OF PSYCHOLOGY
DECEMBER 21, 2009

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ABSTRACT

Small subsets of first-time criminal offenders go on to commit additional crimes. For some, the number of crimes committed can be quite great. It is believed to be the case that a small group of “recidivists” commits a majority of crime. A number of methods to detect who is likely to recidivate have been suggested, but there is no present consensus as to a best method. As recidivism is a low base-rate event, it is difficult to predict. A brief overview of these methods is provided. Then, a novel method for detecting recidivism is outlined and examined. In this method one determines cut-offs based on Minnesota Multiphasic Personality Inventory-A K-Scale (MMPI-A) and the Trauma Symptom Checklist for Children post Traumatic Stress Scale (TSCC) are used to predict recidivism. It is suggested that the MMPI-A K-Scale measures not only defensiveness but also ego-strength and openness to treatment. It is further suggested that those with poor ego-strength or who are overly defended, with the presence of unresolved trauma (as measured by the TSCC PTS scale), are more likely to recidivate. Results indicate that this method does not map well to a linear model, but that it is an effective method to detect recidivism in this sample. A comparison to other similar methods is provided and the ramifications and limitations of this study are discussed.

Keywords: Recidivism, Adolescents, MMPI-A, TSCC, Trauma, Treatment Effectiveness.
ACKNOWLEDGEMENTS

For my wife. Your unflagging support has buoyed me through this process.

For Dr. Daniel McKitrick and Dr. Steven Henry. Thank you for your guidance and shared vision.

For St. Mary’s Home for Boys (Est. 1889), and the patients there, for inspiring this work.

PROLOGUE

The author was lead into research in this field by his interest in gender. One of the most significant and profound questions concerning gender, in this writer’s opinion, is the degree to which crime is disproportionately committed by men and boys. This finding remains true across cultures and across generations. Why? This work was created in hopes of moving scientific understanding toward an answer. The first step was to explore previous work in this area and to construct a model for generalizing those findings, then to conceptualize how this current work existed in relation to past work and how it could be guided by that legacy. The next step was to consider that this study had merit and that it could be presented in a way that respected the privacy of its subjects. The work then became an instructor to the author, as it lead him into new areas of understanding and inspired him to learn as he went. Finally, in the presentation of the results, he learned that sometimes one does not end up where one hypothesized one would, and that requires flexibility and humility. It was a long journey and this is the result. Contributing to human understanding is hard work, but it is worth the effort.
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INTRODUCTION

Most criminal offenders commit only one crime. They “learn their lesson” and have no further interactions with the legal system. Other offenders commit crime after crime. In a national (U.S.A.) sample of adult prisoners released in 1994, of which 91% were male, individuals with one prior arrest have a 40.6% rearrest rate within three years. With two priors, the rearrest percentage increases to 47.5%. With three arrests, the percentage goes up to 55.2%. This trend continues until peaking at 82.1% of individuals with more than 15 prior arrests in their criminal history record being rearrested (Langan & Levin, 2002). It is almost as if there is a snowball effect for certain offenders: the more crimes a person commits, the harder it is for him or her to stop committing crimes and the more future crimes they will commit. This phenomenon results in a situation where a small group of people accounts for a disproportionately large amount of crime. For example, in Oregon, for incarcerated adolescent males released between 1997 and 2004, between 62% and 69% had no new offenses for the year following their release. On the other hand, a small group of 3-11% of individuals released during the same period accounted for approximately 50% of new crimes. Those in this group are referred to in the literature as “chronic offenders”. A chronic offender is defined, in this case, as an individual who has been entered in the juvenile justice system three or more times in a 12-month period. (Oregon Juvenile Department Performance Measures 2005, Date Unknown). If there were a reliable method to predict who had the potential to become a chronic offender, it might be possible to prevent him or her from committing a large number of crimes through some form of intervention.

This current work is an attempt to identify such a method. Having been arrested for a past crime is a necessary but not a sufficient criterion for an individual to be considered a chronic
offender. Additionally, identifying individuals as chronic offenders after they have already committed a number of crimes is not nearly as useful to society as identifying such individuals before they commit their second or third crimes. Additional criteria must be examined other than the presence of past arrests in order to predict recidivism with an acceptable level of reliability and validity. Although number of past arrests significantly predicts recidivism (Langan & Levin, 2002), it is a static factor that can only remain constant or increase over the lifetime. Such a factor does not capture any sort of growth or change an individual may experience. It is a deeply seated societal belief that criminality is susceptible to change (through punishment or treatment for example). Therefore, an ideal method for detecting recidivism would be based on dynamic factors that have the capacity to change thorough the life of the individual and would potentially be affected by intervention of some sort. As will be discussed below, psychometric testing is exactly this sort of dynamic factor. Testing examines where the person is at the moment they are tested, and those results can change and fluctuate as the individual changes.

Adolescents may be the most useful group to which such a prediction method could be applied. Children are typically seen as having potential, and to see a child's potential cut short by criminal involvement is disheartening. Intervening early in life, while individuals are still developing, has the potential to be more useful and cost effective than intervening in adulthood. The emergence of criminal behavior in adolescence has been linked to later adult criminality (Benda, Corwyn, & Toombs, 2001), which suggests that the best time to identify and rehabilitate recidivists may be in adolescence. Since a large majority of criminal offenders are male (Langan & Levin, 2002), it makes sense to focus on males. This work aims to explore the possibility of a novel method for identifying adolescent males with the potential to recidivate by examining the predictive relationship between adolescents with at least one arrest, who have received treatment,
and a set of psychometric scores.
REVIEW OF THE LITERATURE

There have generally been three types of variables that have been used to predict recidivism in adolescent males: behavioral and demographic observations, criminal history and criminal ideation, and psychometric measures. A combination of two or all three categories has also been used. A large number of variables correlating with recidivism have been reported in the literature. Typically, these variables have been used to predict recidivism based on the fact that a person has been arrested, and do not consider what might have happened to the person afterwards (such as length of incarceration, presence or absence of treatment, etc.). Benda and Tollett (1999) report that combining variables can lead to improved predictive validity when examining recidivism. There is no consensus, however, over which variables are necessary or sufficient to form such a predictive model (Stoolmiller & Blechman, 2005), and there is the potential for overlapping variability for a number of the variables outlined below. This review covers citations found in the on-line database, “PsychINFO”, which list both “adolescents” and “recidivism” as subjects. Also reviewed were all citations that included “The Minnesota Multiphasic Personality Inventory” and “recidivism” as subjects, as well as all citations that list “The Trauma Symptom Checklist for Children” as a subject. The above reviews include all years and cover book chapters and journal articles. Some additional resources were also reviewed, including statistical information located on the Internet (Langan & Levin, 2002) and a small publication located by the author (Juvenile Department Performance Measures 2005, Date Unknown).

Generally, variables that have correlated with recidivism fall into three categories; behavioral and demographic observations, criminal history and criminal ideation, and psychometric measures. Each will be examined in turn.
Behavioral and Demographic Observations

Behavioral and demographic observations deal with the observable facts about an individual or their environment. Research findings dealing with behavioral and demographic observation often focus on the functioning of the individual as well as the functioning of that individual's family. For an individual, family risk factors include: coming from a large family, a history of inter-family violence or conflict, parental criminality, the presence of delinquent siblings, neglect or abuse by parents, parental drug use, and the reported lack of positive relationship between the individual and his or her parents (Benda, Corwyn, & Toombs, 2001; Benda and Tollett, 1999; Chang, Chen, & Brownson, 2003; Dembo, Schmeilder, NiniGough, & Manning, 1998; Hagell & Newburn, 1996; Lattimore, Visher, & Linster., 1995; Towberman, 1994). These variables all seem to point to the lack of a nurturing environment, or perhaps even a harmful environment. An individual's environment being chaotic, unsupportive or under-stimulating seems to bode poorly for that person.

Demographic variables that have been reported to correlate with recidivism include maleness, ethnic minority status, being held back grades in school, repeated victimization, and having been neglected or abused (Benda, Corwyn, & Toombs, 2001; Chang, Chen, & Brownson, 2003; Dembo et. al., 1998; Juvenile Department Performance Measures 2005, Date Unknown). Again, these variables seem to point to individuals with unique life challenges. Carpenter (2006) as well as Chang, Chen, and Brownson (2003) report that any sort of trauma or repeated trauma can lead an individual to recidivism. It would seem that traumatic life events or situations play a role in recidivism.

Individuals can also associate themselves with recidivism through their actions. These behavioral variables include poor school functioning, having dropped out of a treatment program,
risk seeking behavior, truancy, poor social skills, meeting criteria for a diagnosis of Conduct Disorder, having attended correctional school, reported feelings of alienation or social maladjustment, criminal thinking, behavioral problems, and impulsivity (Archwamety & Katsiyannis, 2000; Benda, Corwyn, & Toombs, 2001; Chang, Chen, & Brownson, 2003; Edwards, Beech, Bishopp, & Erikson, 2005; Foley, 2001; Hagan & King, 1997; Kjelsberg, 1999; Massac, 1998; Miner, 2002). When looking at fire-setting behavior specifically, maleness, age, poor social skills and above average reported family dysfunction are positively correlated with fire-setting risk (Kennedy, Vale, Khan, & McAnaney, 2006). These variables paint a picture of a “misbehaver” and the argument is made that if an individual diverges from societal expectations in little ways, he or she will perhaps also do so in more dramatic ways by committing crimes. That is to say that there are certain personal traits and characteristics that seem to coincide with a criminal career. The, perhaps overly simplistic, story that these variables suggest is one of an individual with a chaotic and traumatic childhood who later goes on to exhibit anti-social behaviors, perhaps mirroring the disarray of his or her childhood.

Criminal History and Criminal Ideation

The second type of predictor variables relate to criminal history and criminal ideation. These variables are useful in that they are matters of public record and are relatively easy data to acquire. Two of the most popular variables in this category include the age an individual was first convicted and the severity of an individual's crime (Archwamety & Katsiyannis, 2000; Benda, Flynn, & Toombs, 2001; Brunner, 1993; Edwards et. al., 2005; Katsiyannis & Archwamety, 1999; Weaver & Wootton, 1992). In general, the age of first criminal offense is negatively correlated with recidivism, and crime severity is positively correlated with recidivism. Along the lines of severity, some studies have found that individuals who perpetrate violent
crimes are more at risk to recidivate than those who commit nonviolent crimes (Edwards et. al., 2005; Lattimore, Visher & Linster, 1995). Other criminal factors that seem to correlate with recidivism include carrying a weapon (Benda and Tollett, 1999), and gang membership (Benda, Flynn, & Toombs, 2001; Benda and Tollett, 1999). Substance use has also been shown to be positively and independently correlated with recidivism (Benda, Corwyn, & Toombs, 2001; Benda, Flynn, & Toombs, 2001; Campbell, 2004; Chang, Chen, & Brownson, 2003; Corrado, Vincent, Hart, & Cohen, 2004; Katsiyannis, Zhang, Barrett, & Flaska, 2004; Kennedy, Vale, Khan, & McAnaney, 2006; Kjelsberg, 1999; Massac, 1998; Stoolmiller & Blechman, 2005). Studies correlating substance use with recidivism may be misleading. Since substance use is already a crime for adolescents, using substance use to predict recidivism is similar to using a person's number of past crimes to predict his or her possibility of recidivism and may not contribute to a model of recidivism.

Many of these variables can also be used to predict that an adolescent offender will become an adult offender. Specifically; if an adolescent has experienced a prior conviction, is male, or has a history of gang involvement or carrying weapons; he is more likely to become an adult offender (Benda, Corwyn, & Toombs, 2001). Age of first offense and age of first drug use are also negatively correlated with adult criminality (Benda, Corwyn, & Toombs, 2001). Generally, these variables seem to suggest some sort of criminal “mindset” exists, which is to say that the more criminally-oriented a person is, the more likely he or she will commit a crime (although such an explanation is likely overly simplistic). When combined with the first type of variables, the picture is of a troubled anti-social individual with a predisposition toward criminal acts. A problem with this construct, however, is that it leads to a static fatalism for such individuals, and does not inform treatment.
Not everyone with a trauma background and with similar behaviors goes on to commit even one crime as such a history is merely correlated with recidivism. Shepherd, Green, and Omobien (2005) found that an individual's general level of functioning (as measured by The Child and Adolescent Functional Assessment Scales) does not relate to recidivism. Harness (2004) found that a number of factors mentioned above are, in fact, not correlated with recidivism, including academic achievement, family characteristics, mental health, institutional behavior and age of first arrest. There are factors that seem to predict reduced recidivism and can mediate the presence of risk factors. These factors include completing a treatment program (Caldwell, Skeem, Salekin, R, & Van Rybroek, 2006; Fanniff, & Becker, 2006; Luchansky, He, Longhi, Krupski, & Stark, 2006), or undergoing academic remediation (Anderson-Pawlina, 2005).

Psychometric Measures

Finally, several psychometric measures seem to correlate with recidivism. One of the most well known psychometric instruments is the Minnesota Multiphasic Personality Inventory-Adolescent Version (MMPI-A). Williams-Anderson (2005) reports that, generally, pathological MMPI-A profiles, as evidenced by one or more elevated T-scale scores on the clinical scales, are positively correlated with recidivism. Some researchers have gone even further with the MMPI-A and have attempted to identify the specific subscales that most correlate with recidivism. Lindgren, Harper, Richman, and Stehbens (1986) report that an elevation in the “psychotic” scales over the “neurotic” scales of the MMPI-II relates to recidivism. Studies also correlate the clinical scale Psychopathic Deviance (Scale 4) with recidivism (Benda, Corwyn, & Toombs, 2001; Benda, Flynn, & Toombs, 2001). Weaver & Wootton (1992) identify a number of specific scales and/or subscales of the MMPI-A, which also are related to recidivism including not only
Psychopathic Deviance but Amorality, Authority Problems, Social Responsibility, and Alcoholism as well. In sharp contrast, Aalsma (2000) reports that, when comparing recidivists to non-recidivists, MMPI-A profiles are not significantly different. The inconsistent correlation between MMPI-A profiles and recidivism suggests a moderating variable may be present.

Another commonly used assessment with adolescent offenders is the Psychopathy Checklist: Youth Version (PCL:YV; Forth, Kosson, & Hare, 2003). Although it is a different sort of assessment from the MMPI-A (based on subjective third party observations rather than self report), it has also been shown to be successful in predicting recidivism. Corrado, Vincent, Hart, & Cohen (2004) identified two and three factor models, based on the PCL:YV, with predictive accuracy ranging from 68 to 63%. The Millon Adolescent Clinical Inventory (MACI) has been shown to relate to recidivism. Gonzalez, (1998) identified a model using the MACI; in combination with behavioral, demographic, and family variables; that had a 74% success rate at identifying the severity of future incarceration (from none to state prison). Salekin, Ziegler, Larrea, Anthony, & Bennett (2003) reported an 89% accuracy rate in identifying recidivists using Reciever Operating Characteristic analysis on a subscale of the MACI. Other lesser-known measures have been shown to predict recidivism as well. These assessments include: the Denial, Immaturity and Asocial subscales of the Jesness Inventory (Benda & Tollett, 1999, Benda, Flynn, & Toombs, 2001); all scales of the Carlson Psychological Inventory (Benda, Flynn, & Toombs, 2001); the Child and Adolescent Functional Assessment Scale (CAFAS: Quist, & Matshazi, 2000). Wechsler Intelligence Scale for Children (WISC) IQ scores seem to relate to recidivism as well (Archwamety & Katsiyannis, 2000; Brunner, 1993; Katsiyannis & Archwamety, 1999; Weaver & Wootton, 1992). Vermeiren, Schwab-Stone, Ruchkin, De Clippele, and Deboutte, (2002) describe low IQ as a predictor but only when combined with the
presence of Conduct Disorder, which consists of a history of law violations and antisocial behavior, and the absence of depressive symptoms.

Of the three types of variables, psychometric assessment is most promising in many ways. Foremost is the consistent finding that actuarial methods of prediction are as good as, if not better than, subjective ones (Meehl, 1954). Many of the above variables rely on interpretation or honesty. For example an individual's social skills can only be described subjectively, and an individual's level of reported drug use is highly dependent on how forthcoming that individual is. Even something that is seemingly actuarial, like a person's arrest record, has some subjectivity to it. Ultimately a jury of peers decides an individual's guilt or innocence. What if a person has been wrongly arrested? Using data that is vulnerable to such errors as basis of prediction will result in potentially unsatisfactory outcomes.

Psychological assessments have some advantages over less objective methods of data collection. An assessment gives every individual an opportunity to respond to the same stimulus. In a sense, an assessment levels the historical and demographic “playing field” and avoids using variables that can seem discriminatory, such as gender, race, and family background. It is important to note, however, that assessment measures are sometimes normed on groups that could be seen as unrepresentative of minority populations (Ridley, Hill, & Wiese, 2001) and must be applied with caution. Also, unlike a person's past, a test score can change as a person undergoes treatment. Assessment techniques based on history will always return the same result regardless of successful rehabilitation. Additionally, assessment results can be used to directly compare individuals or easily create numerical cut-off points, which can be useful in classification and prediction.

Some assessments even retain aspects of many of more subjective variables. The MMPI-
A and the PCL:YV, in particular, ask questions about substance use, social skills, and family background. An assessment has the potential to capture much of the variability described by less ideal variables. The challenge becomes selecting which assessments to use.

The MMPI-A and the TSCC

The number of previous works that use the MMPI-A form a strong tradition, but there is one scale for which its relationship to recidivism has not been researched. That scale is the K Scale (Hathaway & Meehl, 1947). The K Scale was originally developed as a correctional factor that would adjust other scales in an MMPI profile based on a person's “defensiveness”. That is to say, if a person were to answer questions in a way that would seem to indicate that he or she was trying to make themselves sound less pathological than he or she actually were, the “K Correction” would adjust certain clinical scales to more accurately reflect the person's level of pathology. This scale is traditionally thought of as a validity scale, and not as relevant to diagnosis as the clinical scales, but research since its inception indicates that the K-Scale measures substantive traits and is not merely a corrective factor (McCrae, Costa, Dahlstrom, Barefoot, et. al., 1989). Attempts have been made to illuminate the substantive traits of the K Scale. Krebsbach (2006) suggests that the K Scale is positively correlated with successful treatment outcomes, as did Tortorella (1973). McGrath, Sweeney, O'Malley, and Carlton (1998) report that the K-Scale can be used to assess the cause of pain in chronic pain patients. Munley and Busby (1994) report that an elevated K-Scale may be a negative treatment indicator. Friedman, Lewak, Nichols and Webb (2001) suggests that the K scale may measure sophisticated deceptiveness and serves as a counterpoint to the L Scale, which detects unsophisticated deception, and that deceptiveness expressed via the K Scale may be a function of intelligence.

Kimball and Cundick (1977) report that the K-Scale may have nonlinear implications.
They found that both low and high K-Scale scores have different and meaningful implications, in this case relating to emotional responsiveness to stressful stimulus.

It is hypothesized that the K-Scale could be used to predict recidivism because it consists of items that are similar, in content, to some of the above variables (such as family support and social functioning) while also measuring a new factor that has a potential to relate to recidivism: defensiveness to treatment, or sophisticated denial of pathology (Friedman, Lewak, Nichols & Webb, 2001).

The Trauma Symptom Checklist for Children (TSCC: Briere, 1996) is traditionally used to examine the impact of traumatic life events on a child in order to establish a baseline of functioning and guide treatment. Since most of the variables described as behavioral and demographic can be seen has relating to trauma, the Post Traumatic Stress Scale of the TSCC may tap into the same source of variability. The TSCC PTS scale measures intrusive thoughts and sensations, memories of painful past events, occurrence of nightmares, and cognitive avoidance of painful feelings. Since traumatic events such as abuse and neglect have been identified as predictors of recidivism, then this scale also captures the variability related to a traumatic history.

Therefore, by combining the MMPI-A's K scale with the TSCC's PTS Scale one is able to form a picture of a person based on the degree to which a person has been traumatized and the capacity he or she has to handle such trauma (ego-strength). Either one or both of these variables has the potential to predict recidivism, with the most successful model likely including both.

Research Questions

As has been reviewed, there is a large body of work relating to the prediction of recidivism yet many of the existing methods are unsatisfactory (Meehl, 1954) or unsuccessful
(Shepherd, Green, and Omobien, 2005; Harness, 2004). The aim of the current research is to expand upon the knowledge of effective psychometric recidivism-predicting methods.

It is hypothesized that TSCC PTS scores and MMPI-A K scores together will significantly predict recidivism to a degree superior to either score on its own. Furthermore, it is hypothesized that the relationship between these variables would prove to be nonlinear (Kimbal & Cundick, 1977), with both low K Scale scores and high K Scale scores, when combined with moderate or higher levels of trauma symptoms reported, being the best predictors of recidivism in adolescent males.
METHOD

Subjects

The data sample was drawn from the archival data of a major northwestern United States male adolescent treatment facility. The archive includes data on 58 adolescent male clients dating back to 1993, which was gathered for individual case management purposes. There are preexisting disclosure agreements from these individuals (or their guardians) that allow for information from their cases to be used in research such as this. The staff of this facility, to protect the confidentiality of the individuals as well as the identity of the facility itself, has anonymously coded the data.

Procedure

No additional, project specific, informed consent was gathered as all information being used is archival and preexisting consent has been given. Variable data was drawn from an existing archive database, and has already been stripped of identifying information. Additionally, the reference number for each individual was changed for the purposes of this study before the data is handed over so that no exposure to individual identifying information can occur.

The variables necessary for the proposed analyses were drawn from this archive and consist of psychometric predictor variables, supporting psychosocial variables, and outcome variables based on self-report follow-up interviews. The interviews were conducted three months after the completion or discontinuation of treatment. Psychometric predictor variables include the individual's Full Scale IQ scores, MMPI-A Scale K scores and TSCC PTS scale score, at the time of their departure from the institution. Outcome variables include occurrence of arrest or charge within three months of cessation of treatment, incarceration within three months of cessation of treatment, and illicit substance use within three months of cessation of treatment.
Design

A single-group, single-measurement design has been used. Such a design is sufficient to establish a correlation (if any) between recidivism and test scores. This study can best be described as Non-Experimental, as only one measurement has been gathered. Additionally, this design relies on a convenience sample. The range of test scores are compared to the corresponding outcomes regarding recidivism, since showing correlation between recidivism and test scores would be sufficient to suggest the utility of this technique.

Within-Program Performance Criteria

For each individual, the organization attempts to follow up on his progress at three, six, and twelve months to see how successful the individual has been at avoiding criminal activity. An individual is considered a success if he has avoided receiving additional convictions as well as avoiding drug and alcohol use, police contact, and illegal behavior that have not come to the attention of law enforcement. The presence or absence of these behaviors or additional convictions is collected from the self-report of the offender or someone who knows him such as a parent or guardian of the individual (at a ratio of about 50% self report 50% parent or guardian report). The inter-rater reliability between this measure of recidivism and state records on the same individuals are reported to be above 90% (according to staff of the facility, not verified).

Statistical Analyses

Analyses include an exploration of relevant descriptive statistics. Pearson's Product-Moment Predicate match was used to establish correlation. As it is hypothesized that the K Scale variable may have a nonlinear relationship to the recidivism variables nonlinear, it has been converted into a linear variable by converting each result into the absolute value of its distance from the mean. This method creates a measure of distance from the mean that is mono-
directional and more convenient for analysis (Rosenthal & Rosnow, 2008, pg. 346). Rather than using the research mean for K Scale scores (M=50) the sample mean has been used (M = 59.62). A one-sample t-test indicates that the sample group is significantly different from the research mean (t(57) = 6.463, p<0.000). As the goal is to identify recidivists from among prior offenders, was deemed reasonable to base analysis on the mean score of prior offenders, rather than that of the general population.

Logistic regression has been used, as the dependent variable in question, presence of recidivism, is discrete. As the relationship between the aforementioned variables is unknown, Stepwise Logistical Regression has been used to approximate more robust nonparametric statistical technique. Other methods have been used to illuminate the extent of the nonlinearity of the relationship. Cluster Analysis has been used to examine the utility of these variables to group the subjects. Factor analysis has been used to examine the degree to which the variables co-vary. Signal Detection analysis has been used to produce a Receiver Operating Characteristic (ROC) curve, a measure of predictive accuracy. This method examined the optimal cut off points for distinguishing between potential recidivists and non recidivists. ROC analysis provides an excellent way to determine the most optimal cut off points for tests of this nature. Additionally, graphs and contingency tables have been provided to illustrate trends that may fall below formal significance levels.
RESULTS

Table 1 presents a guide to the abbreviations used in this study.

Table 1

<table>
<thead>
<tr>
<th>Variable</th>
<th>Abbreviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full Scale IQ</td>
<td>FSIQ</td>
</tr>
<tr>
<td>MMPIA-K Score Pre Treatment</td>
<td>KPRE</td>
</tr>
<tr>
<td>MMPIA-K Score Post Treatment</td>
<td>KPOST</td>
</tr>
<tr>
<td>KPRE-KPOST</td>
<td>KCHANGE</td>
</tr>
<tr>
<td>MMPIA-K Distance from Mean Pre Treatment</td>
<td>KNORMPRE</td>
</tr>
<tr>
<td>MMPIA-K Distance from Mean Post Treatment</td>
<td>KNORMPOST</td>
</tr>
<tr>
<td>Change in Distance from Mean from Pre to Post</td>
<td>KNORMCHANGE</td>
</tr>
<tr>
<td>TSCC- Post Traumatic Stress Score Pre Treatment</td>
<td>PTSPRE</td>
</tr>
<tr>
<td>TSCC- Post Traumatic Stress Score Post Treatment</td>
<td>PTSPOST</td>
</tr>
<tr>
<td>PTSPRE-PTSPOST</td>
<td>PTSCHANGE</td>
</tr>
<tr>
<td>Rearrested within 3 Months Post Treatment</td>
<td>ARREST</td>
</tr>
<tr>
<td>Incarcerated within 3 Months Post Treatment</td>
<td>INCARCERATE</td>
</tr>
<tr>
<td>Used Illegal Drug within 3 Months Post Treatment</td>
<td>DRUGUSE</td>
</tr>
</tbody>
</table>
Table 2 describes the demographic variables of the 58 subjects. Note that some variables list an n of less than 58, which is due to incomplete data sets for some subjects.

Table 2

*Subject Demographics*

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Min</th>
<th>Max</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time in Treatment (Years)</td>
<td>58</td>
<td>0.1</td>
<td>2.9</td>
<td>1.5</td>
<td>0.6</td>
</tr>
<tr>
<td>FSIQ</td>
<td>57</td>
<td>71</td>
<td>133</td>
<td>94.4</td>
<td>12.2</td>
</tr>
<tr>
<td>KPRE</td>
<td>39</td>
<td>30</td>
<td>75</td>
<td>50.3</td>
<td>12.0</td>
</tr>
<tr>
<td>KPOST</td>
<td>58</td>
<td>34</td>
<td>78</td>
<td>59.6</td>
<td>11.3</td>
</tr>
<tr>
<td>KCHANGE</td>
<td>39</td>
<td>-26</td>
<td>38</td>
<td>8.8</td>
<td>14.8</td>
</tr>
<tr>
<td>KNORMPRE</td>
<td>39</td>
<td>2</td>
<td>29</td>
<td>11.9</td>
<td>8.7</td>
</tr>
<tr>
<td>KNORMPOST</td>
<td>58</td>
<td>0</td>
<td>25</td>
<td>9.7</td>
<td>5.7</td>
</tr>
<tr>
<td>KNORMCHANGE</td>
<td>39</td>
<td>-19</td>
<td>15</td>
<td>-2.6</td>
<td>8.9</td>
</tr>
<tr>
<td>PTSPRE</td>
<td>55</td>
<td>37</td>
<td>93</td>
<td>51.8</td>
<td>12.7</td>
</tr>
<tr>
<td>PTSPOST</td>
<td>58</td>
<td>36</td>
<td>66</td>
<td>46.1</td>
<td>7.6</td>
</tr>
<tr>
<td>PTSCHANGE</td>
<td>55</td>
<td>-44</td>
<td>17</td>
<td>-5.6</td>
<td>12.2</td>
</tr>
</tbody>
</table>

Note. All subjects were male. Age not collected to protect anonymity, but subjects were all between ages of 14 and 18 at time of discharge. Some variables list an n of less than 58, that is due to incomplete data sets for some subjects.

Subjects tend to be within the normal range for IQ. On average, subjects tend to exit treatment with higher defenses (KCHANGE) and lower reported unresolved trauma (PTSCHANGE). Table 3 describes the number of individuals that again become criminally
involved within three months of exiting treatment and illustrates the low occurrence of recidivism:

Table 3

*Outcome Variables at Three Months*

<table>
<thead>
<tr>
<th></th>
<th>n</th>
<th># Endorsing</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARREST</td>
<td>58</td>
<td>7</td>
</tr>
<tr>
<td>INCARCERATE</td>
<td>58</td>
<td>5</td>
</tr>
<tr>
<td>DRUGUSE</td>
<td>51</td>
<td>15</td>
</tr>
</tbody>
</table>

Note. DRUGUSE includes cigarette smoking.

Table 4 describes the strength and direction of the relationship between the examined variables:
Table 4
Pearson Correlation Matrix of Relevant Variables

<table>
<thead>
<tr>
<th></th>
<th>FSIQ</th>
<th>KPRE</th>
<th>KPOST</th>
<th>KCHANGE</th>
<th>KNORMPRE</th>
</tr>
</thead>
<tbody>
<tr>
<td>KPRE</td>
<td></td>
<td>-0.14</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>KPOST</td>
<td>0.10</td>
<td></td>
<td>0.23</td>
<td></td>
<td></td>
</tr>
<tr>
<td>KCHANGE</td>
<td>-0.19</td>
<td>0.64**</td>
<td>-0.60**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>KNORMPRE</td>
<td>0.13</td>
<td>-0.80**</td>
<td>-0.37**</td>
<td>-0.37*</td>
<td></td>
</tr>
<tr>
<td>KNORMPOST</td>
<td>-0.27</td>
<td>-0.19</td>
<td>-0.038*</td>
<td>-0.13</td>
<td>0.27</td>
</tr>
<tr>
<td>KNORMCHANGE</td>
<td>0.30</td>
<td>0.64**</td>
<td>-0.33</td>
<td>-0.27</td>
<td>0.78**</td>
</tr>
<tr>
<td>PTSPRE</td>
<td>0.63**</td>
<td>-0.53**</td>
<td>-0.19</td>
<td>-0.29</td>
<td>0.56**</td>
</tr>
<tr>
<td>PTSPOST</td>
<td>0.22</td>
<td>-0.01</td>
<td>-0.21</td>
<td>0.16</td>
<td>0.07</td>
</tr>
<tr>
<td>PTSCCHANGE</td>
<td>0.48**</td>
<td>-0.49**</td>
<td>-0.07</td>
<td>-0.34</td>
<td>0.48**</td>
</tr>
<tr>
<td>ARREST</td>
<td>-0.02</td>
<td>-0.16</td>
<td>0.08</td>
<td>-0.20</td>
<td>0.08</td>
</tr>
<tr>
<td>INCARERATE</td>
<td>-0.11</td>
<td>-0.16</td>
<td>-0.13</td>
<td>-0.03</td>
<td>0.13</td>
</tr>
<tr>
<td>DRUGUSE</td>
<td>0.01</td>
<td>0.30</td>
<td>0.37*</td>
<td>-0.05</td>
<td>-0.30</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>KNORMPOST</th>
<th>KNORMCHANGE</th>
<th>PTSPRE</th>
<th>PTSPOST</th>
<th>PTSCCHANGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>KNORMCHANGE</td>
<td>-0.39*</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PTSPRE</td>
<td>-0.04</td>
<td>0.56**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PTSPOST</td>
<td>-0.12</td>
<td>0.14</td>
<td>0.09</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PTSCCHANGE</td>
<td>0.02</td>
<td>0.45*</td>
<td>0.88**</td>
<td>-0.40*</td>
<td></td>
</tr>
<tr>
<td>ARREST</td>
<td>0.10</td>
<td>0.01</td>
<td>0.00</td>
<td>0.27</td>
<td>-0.13</td>
</tr>
<tr>
<td>INCARERATE</td>
<td>0.38*</td>
<td>-0.12</td>
<td>0.01</td>
<td>0.02</td>
<td>0.00</td>
</tr>
<tr>
<td>DRUGUSE</td>
<td>0.14</td>
<td>-0.37*</td>
<td>0.02</td>
<td>-0.16</td>
<td>0.09</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>ARREST</th>
<th>INCARERATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>INCARERATE</td>
<td>0.43*</td>
<td></td>
</tr>
<tr>
<td>DRUGUSE</td>
<td>-0.12</td>
<td>-0.32</td>
</tr>
</tbody>
</table>

Note. * = \( p < .05 \), ** = \( p < .01 \).
With two exceptions, Table 4 indicates no significant correlations between either INCARCERATE or ARREST and any of the independent variables being explored (KPOST, KNORMPOST and PTSPOST). KNORMPOST shows a significant positive relationship with INCARCERATE ($r = 0.38$, $p = 0.05$). KNORMCHANGE shows a significant negative relationship with DRUGUSE ($r = -0.37$, $p = 0.05$).

Regression using PTSPOST and KPOST on INCARCERATE (Multiple $R^2 = 0.02$, $p = 0.55$) and ARREST (Multiple $R^2=0.04$, $p=0.31$) found no usefulness in predicting outcomes on a linear model. Regression using KNORMPOST, designed to eliminate potential nonlinearity, and PTSPOST on INCARCERATE (Multiple $R^2=0.03$, $p=0.45$) and ARREST (Multiple $R^2=0.00$, $p=0.90$) found no usefulness in predicting outcomes on a linear model. Analysis of Covariance using the same pairings and with FSIQ as a covariate, with one exception, produced no significant results (Multiple $R^2 = 0.90$, $p = 0.66$, Multiple $R^2 = 0.70$, $p = 1.00$, Multiple $R^2 = 0.51$, $p = 0.04$, and Multiple $R^2 = 0.59$, $p = 0.46$ respectively).
Figure 1. Mosaic Plots a, b, c, and d derived from Regression variables.

Plots a-d of Figure 1 are 2D depictions of 3D information. The variable listed in the key to the right of each plot represents the z axis. The transition from blue to red represents areas where recidivists are plotted and non-recidivists are not. That is to say that as the color approaches red, individuals with the corresponding X and Y axis values are recidivists with increasing frequency. Green indicates that individuals with the corresponding X and Y axis values could go either way. Blue indicates no pattern in results. Plot a (Figure 1) shows that high KPOST and PTSPOST individuals tend to recidivate by being arrested. Further, the green areas of Plot a (Figure 1) show that individuals with low KPOST and PTSPOST or with high KPOST and low PTSPOST display some recidivism as well. Plot b (Figure one) shows recidivism, as
defined by INCARCERATE, to be present strongly at low levels of KPOST and PTSPOST and
moderately present as KPOST increases. Plot c (Figure 1) suggests that low to moderate
PTSPOST with moderate KNORMPOST as well as moderate PTSPOST with low
KNORMPOST coincide with recidivism as measured by ARREST. Plot d (Figure 1) shows that,
for all values of PTSPOST, high KNORMPSOST is associated with recidivism as measured by
INCARCERATE, as is moderate PTSPOST and KNORMPOST values. Each of these plots
suggest a non-linear relationship may be present, even after applying the above mentioned K-
Score transformation which was hypothesized to control for such relationships. This suggests a
non-linear relationship results in the non-significance of the linear model.

The following analyses are attempts to explore the non-linear relationship between
reported unresolved trauma, defensiveness and recidivism. Employing k-means Cluster analysis
indicates that both PTSPOST (F = 25.95, 53 d.f.) and KPOST (F = 59.37, 56 d.f.) are
significantly useful in distinguishing between participants, when ARREST and
INCARCERATION variables are included.

Factor analysis can be used to describe the relationships between groups of variables,
particularly when the individual variables do not account for significant correlations on their
own. Table 5 represents attempts to describe the relationship of recidivism to other variables
through factor analysis:
Table 5

*Two Factor Model of Outcome and Assessment Variables*

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARREST</td>
<td>0.12</td>
<td>0.80*</td>
</tr>
<tr>
<td>CONVICT</td>
<td>-0.11</td>
<td>0.79*</td>
</tr>
<tr>
<td>KPOST</td>
<td>0.87*</td>
<td>0.04</td>
</tr>
<tr>
<td>PTSPOST</td>
<td>-0.82*</td>
<td>0.02</td>
</tr>
<tr>
<td>% Total Variance</td>
<td>36.26</td>
<td>31.61</td>
</tr>
</tbody>
</table>

Note. * = Strongest loading.

The loadings for factor 1 and 2 of Table 5 are quite distinct. Other variations were attempted to improve upon the results of this model. Table 6 represents the same effort with the addition of FSIQ as a variable:
Table 6

*Three Factor Model of Outcome and Assessment Variables*

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARREST</td>
<td>0.08</td>
<td>-0.70*</td>
<td>0.47</td>
</tr>
<tr>
<td>CONVICT</td>
<td>-0.06</td>
<td>-0.87*</td>
<td>-0.21</td>
</tr>
<tr>
<td>FSIQ</td>
<td>0.01</td>
<td>0.03</td>
<td>0.88*</td>
</tr>
<tr>
<td>KPOST</td>
<td>0.83*</td>
<td>0.03</td>
<td>0.24</td>
</tr>
<tr>
<td>PTSPOST</td>
<td>-0.85*</td>
<td>0.03</td>
<td>0.19</td>
</tr>
</tbody>
</table>

% Total Variance
28.60 24.84 22.70

Note. *=Strongest loading.

It was thought that recidivism might be best explained by a two factor model with recidivism variables as one factor and a second factor defined as low reported trauma at discharge (PTSPOST) and divergent defensiveness relative to the sample mean, (KNORMPOST). VARIMAX rotated factor analysis modeling this assumption accounted for 58% of the variance. As seen in Table 5, using non-transformed K scores (KPOST) in the same style analysis accounted for 68% of the variance. As suggested above, IQ is thought to be related to the recidivism construct (Archwamety & Katsiyannis, 2000). An additional VARIMAX rotated factor analysis including FSIQ (Table 6) explained 76% of the variance in the data. The best overall fit for the available data is a three factor model, with an absence of recidivism variables, an “ego-strength” factor consisting of defensiveness plus lack of reported trauma, and FSIQ comprising each of the three factors respectively.

A signal detection analysis was performed to further explore the potential relationship...
between post treatment ego strength variables and recidivism variables. Coding variables were defined in Table 7 as follows:

Table 7

_Signal Detection Coding Variable #1_

<table>
<thead>
<tr>
<th></th>
<th>KNORMPOST ≤ 9</th>
<th>KNORMPOST &gt; 9</th>
</tr>
</thead>
<tbody>
<tr>
<td>PTSPOST ≤ 46</td>
<td>0</td>
<td>No Prediction</td>
</tr>
<tr>
<td>PTSPOST &gt; 46</td>
<td>No Prediction</td>
<td>1</td>
</tr>
</tbody>
</table>

*Note. 1=predicted to recidivate, 0=predicted to not recidivate.*

The resulting ROC curves (shown in figure 2 and 3) indicated that this method is a significant improvement over chance in identifying which subjects would be recidivate (ROC area 0.756 for ARREST and 0.645 for INCARCERATE).

It is thought that responsiveness to treatment, as indicated by a reduction in reported trauma, may be a factor in recidivism. A second signal detection analysis substituting PTSPOST for PTSCHANGE and with the following Coding variable was performed:
Table 8

*Signal Detection Coding Variable #2*

<table>
<thead>
<tr>
<th>PTSCHANGE &gt; -10</th>
<th>KNORMPOST &lt; 12</th>
<th>KNORMPOST &gt; 11</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Prediction</td>
<td>0</td>
<td>No Prediction</td>
</tr>
<tr>
<td>PTSCHANGE &lt; -9</td>
<td>No Prediction</td>
<td>1</td>
</tr>
</tbody>
</table>

Note. 1=predicted to recidivate, 0=predicted to not recidivate.

The ROC curves depicted in Figure 4 and 5 indicate PSTCHANGE is more useful in predicting recidivism variables than PTSPOST (ROC area 0.837 for ARREST and 0.837 for INCARCERATE).

*Figure 4. Signal Detection for ARREST*  
*Figure 5. Signal Detection for INCARCERATE*
DISCUSSION

This project tested the hypothesis the extent to which recidivism can be predicted by selected variables. The reported findings seem to cast doubt on the utility of using linear models, but analyses that attempted to tease out non-linear relationships found intriguing results for this pilot study.

The results of this investigation indicate that the relationship between defensiveness, as measured by the MMPI-A K Scale, traumatization, as measured by the TSCC PTS Scale, and recidivism are mixed. Reported trauma symptom level seemed to have no significant direct relation to recidivism in this sample despite findings to the contrary. Defensiveness was shown to have a significant positive relationship with one recidivism variable (INCARCERATE; \( r = 0.38, p = 0.05 \)) suggesting that either the more strongly developed one’s defenses are, the more likely it is that one will recidivate, or that recidivists tend to have well developed defenses, or that there is some unknown moderating variable. The first possibility, that strong ego defenses lead to recidivism, seems counter intuitive. The K-Scale was originally intended to reduce the number of false negatives on the MMPI without impacting overall accuracy. It has since been said to relate to ego strength, reality contact, and coping abilities as well as defensiveness, guardedness, and test-taking posture, such as trying to appear more or less pathological (Friedman, Lewak, Nichols & Webb, 2001). Each of the subjects was exposed to 18 months of treatment, on average, before exiting treatment and must surely have been affected somehow. Perhaps high K-Scale scores for the subjects who recidivate indicate that, rather than being positively affected by treatment, they had learned how to fool the system by not admitting to any pathology (i.e. faking good). Such an individual can be said to have maintained or developed maladaptive defenses. A person possessing maladaptive defenses such as these may have formed
an anti-social change-resistant self concept and further treatment may be unproductive at that
time. This view is consistent with the general observation that for a subset of offenders,
punishment does not impact recidivism. Intervention only serves to solidify this minority’s
antisocial personality characteristics.

Another interesting observation is that one possible moderating variable, IQ, was not
shown to be related to the variables examined. FSIQ was shown, however, to have a strong
relationship with pre-treatment levels of reported unresolved trauma (PTSPRE; r = 0.63, p =
0.01), suggesting the possibility that the intelligent are better able to use the instrument to
express trauma. IQ is often described as a protective factor (Cederblad, Dahlin, Hagnell, &
Hansson, 1995) but here is correlated with more severe reported trauma symptoms. Additionally,
including IQ as a covariate, in some cases, seemed to improve the expression or the relationship
between K scores PTS scores and recidivism as a linear model, for example when using
KNORMPOST and PTSPOST to model INCARCERATE (Multiple R²=0.03, p=0.45 vs.
Multiple R² = 0.51, p = 0.04). These findings warrant further exploration but are outside of the
scope of the current work.

None of the examined variables were shown to be useful in predicting the recidivism
variables when employing a linear model. This is likely an artifact of the difficulty in predicting
very low incident rate events with a small sample size. Graphic display of the regression using
the variables (Figure 1), suggested the possibility of a nonlinear relationship, as the distribution
is quite non-uniform, warranting further analysis. Although it appears that a relationship is
present, none of the plots seem to support the stated hypothesis, which would have appeared as
red areas in the upper right and left corners for plots a and b or as a red area in just the upper left
for plots c and d. In all of the plots depicted in Figure 1 there seems to be some overlap between
low reported trauma and recidivism, an unanticipated result. A method that succeeded at
detecting all recidivists may have to include additional (ideally dynamic) factors.

Present in the correlation matrix (Table 4) is a significant (p < 0.01) negative correlation
between K-Scale scores (KPRE) and reported trauma (PTSPRE) at intake into treatment. This
suggests that the highly defended report fewer trauma-related symptoms at intake. This
occurrence can perhaps be explained by "denial" or "accountability" constructs. Other findings
also suggest a denial construct is at play. A nonsignificant negative relationship between K-
Scores and recidivism variables at intake suggests that entering treatment with some ego
defenses is a good sign; an individual wants to have some pre-existing defenses. Individuals that
display the same pattern at discharge: high K-Scale with low reported trauma, a pattern
consistent with defensiveness, are at increased risk to recidivate (Figure 1). The low base rates of
recidivism, range restriction and small sample size make it difficult to get the size of variance
needed for statistical significance in the regression analyses. A denial effect is, however, hinted
at in the above plots (Figure 1) and Factor Analysis (Table 6). It would seem that for individuals
who are able to articulate their traumatic experiences, recidivism is less of a factor
(accountability). Despite the lack of clarity in this model, the criteria defining the signal and
noise are sensitive enough in expressing the interaction of reported trauma (PTSPOST) and
defensiveness (KNORMPOST) that the Signal Detection Analysis is able to quite accurately
identify the signals (recidivists). For offenders entering treatment something has gone wrong
(they committed a crime). Individuals unwilling to discuss things such as trauma perhaps are also
unwilling to acknowledge and explore what might have gone wrong with their own behavior. For
this "in-denial-of" group, recidivism continues to be an issue. Perhaps some measure of denial or
accountability could cover the gap in detection represented by low reported trauma, high
defensiveness recidivists.

Factor analysis (Table 6) revealed some interesting results. Although analysis was initially conducted using the K-Score conversion (KNORMPOST) additional variation was explained by using unmodified K-Scale score (KPOST) The first factor’s loadings for defensiveness and “not” reported unresolved trauma suggest that being well adjusted or relaxed or “safe feeling” may be a component in the presentation of an offender. High K may indicate an individual who has learned to protect his or her ego from his or her external environment by cultivating detachment of lack of interest in external messages. Such individuals would feel like they are perfectly all right and would reject the notion that there was anything wrong with them. Under reporting PTS would be consistent with this conceptualization: Trauma is an internal threat and can be discounted by the individual in much the same way as an external threat. Thus an individual who is defended from both internal and external messages would be quite resilient to both internal and external pulls to change. Such a presentation would be consistent with Narcissism and this factor might be improved by the inclusion of a variable that tracked Narcissistic tendencies.

The second identified factor (Table 6) consisted of strong negative loadings on the recidivism variables suggesting a strong “non-recidivism” or “learned-my-lesson” factor. This reinforces the idea that the typical first time or second time offender will not recidivate (Juvenile Department Performance Measures 2005, Date Unknown). Treatment as usual (navigating the criminal justice system) works in most cases, but why? A typical legal punishment will consist of some type restriction of freedom. That restriction serves as a disruption. Even just receiving a stern talking to from a legal authority such as a police officer or a judge can dissuade an individual from criminality. Each of the offenders in this sample were treated at a residential
facility. Perhaps the most important disruption for them is the disruption of the family or community system. Disruption of the family/community system is a common characteristic of many social consequences such as a child being placed in foster care of an individual being incarcerated. As noted above, there are many family characteristics (such as parental criminality) that serve as warning factors for recidivism. Even limited time away from an individual’s family or community setting may cause that individual to learn skills that allow him or her to be more flexible when he or she returns to his or her systems. Under this conceptualization, what would constitute an adequate disruption? Currently society bases the extent of the disruption on the severity of the crime, but perhaps there are other criteria upon which such a decision could be based.

The negative relationship of the factor loadings to Factor 2 (Table 6) is interesting. Current conceptualizations of chronic offenders often suggest that this group possesses some attribute, such as sociopathy, not present in the general population. Perhaps it would be more useful to conceptualize research of this type as working to identify criminal resilience, rather than recidivism. In general, it is easier to detect a higher probability event. To continue the analogy, what might factor into a criminal resiliency construct? Perhaps it is useful to think, “What must offenders learn or be exposed to in order to change their life trajectory?” Mandated treatment and incarceration both serve to disrupt an individual’s patterns, so disruption of some sort may play a role. Treatment often focuses on asking individuals to reflect on their internal processes and motivations in the hopes of gaining insight. Therefore individuals’ skill at introspection may be relevant. The inverse of the defensiveness and reported trauma factors discussed in this study might also apply. Rather than defensiveness one might examine openness, honesty and curiosity. The inverse of trauma might be the stability and predictability of one’s
environment or one’s ability to avoid over-generalizing when exposed to traumatic events. Such a construct could be seen as the beginning of a “strength based” approach to recidivism research.

The third factor reinforces the idea that IQ plays an important role in the presentation of an offender. Although traditional assessments of intelligence, such as the WISC, do not make more than passing attempt to identify morality or social adjustment (such as the Comprehension subtest), many sources report a connection between IQ and recidivism. The simplest explanation might be that those with higher IQ’s are better able to weigh the consequences of their actions and avoid unwanted consequences. Another possibility is that criminality is a moderating factor for both recidivism and IQ. Although IQ is said to be a measure of latent ability, it is also affected by many factors including education (Neisser et al., 1998). A tendency to not work well in an established structure or follow rules may inhibit an individual’s ability to benefit from education as well as cause legal problems. If a child is constantly being suspended or punished in school, he or she would likely be distracted and benefit less than his or her peers. Consequently that child would underperform on WISC subtests influenced by education, such as the Information subtest. Examining the connection between recidivism and WISC profiles that fit this pattern might yield interesting results.

The results from the Signal Detection Analysis modeling the above stated hypothesis are promising (Figure 2, 3). Despite the fact that the relationship between the relevant variables is unclear, this model proved to be 65% accurate at detecting incarceration and 75% accurate at detecting rearrest. Experimentation with the variables lead to the observation that substituting degree of change in reported trauma from pre to post treatment (PTSCHANGE) into the model lead to even better predictive accuracy (84% accurate for both measures of recidivism). Although definitions for what constitutes recidivism differ, Table 9 provides an overview of the accuracy
rates for some of the alternate actuarial methods mentioned above.

Table 9

Comparison of Other Findings

<table>
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<th>Reported accuracy Rates</th>
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<tr>
<td>Corrado (et. al., 2004)</td>
<td>63%-65%</td>
</tr>
<tr>
<td>Gonzalez (1998)</td>
<td>74%</td>
</tr>
<tr>
<td>Salekin (et. al., 2003)</td>
<td>89%</td>
</tr>
</tbody>
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The results of both of the Signal Detection models fall within the range of accuracy reported by other researchers (Table 9), with the second method falling slightly short of the Salekin (et. al., 2003) method. Although the second method produces superior results, it has some limitations in application. Tracking changes in reported trauma over time requires repeated measurements and that the individual engage in some form of treatment, before a determination can be made. The first method is still of sufficient utility to warrant application where the data necessary are available. Figure 6 explores the interaction of PTSCHANGE further.
Future researchers may benefit from exploring the possibility of two subtypes of recidivists suggested by tracking changes in reported trauma from pre to post treatment. Some follow up exploration to the finding that PTSCHANGE is more useful in Signal Detection analysis than just PTSPOST indicated the following (Figure 6): A moderate KNORM score (between 10 and 20) and an increase in reported trauma (PTSCHANGE < -10 and > -20) seems to relate to recidivism. Further, very high KNORM scores with significant drops in reported trauma from pre to post treatment (PTSCHANGE > 20). What other constructs may relate to these groups (such as malingering or psychopathy) remains unexplored.

The K-score transformation used in some of the analysis was of mixed utility. It failed to identify a successful linear model as hypothesized, but did prove to be quite useful when used for Signal Detection analysis. This is likely because of the difficulty of detecting low probability events such as recidivism was in this sample. Signal Detection, for example, requires less variation in the input variables to produce significant result. A larger sample may prove out this method, or may reveal a better mean on which to base the conversion.
To reiterate, the stated hypothesis is that offenders who report trauma at time of discharge (PTSPOST) are in danger of recidivating if they lack ego-defenses or if they present as highly deviant in treatment (KNORMPOST). This hypothesis is somewhat supported by these findings. Taken at face value, these findings indicate that insufficiently resolved trauma can erode the coping represented by the K-Scale and together represent low ego strength and can inform the assessment of recidivism risk.

This study is relevant to both future research and clinical practice as it suggests a novel method for describing and predicting human behavior. Clinicians may wish to employ this method or a similar method upon the data that they are already collecting. It is important, however, to note the limitations of this study and suggest how it could be improved. The sample size of only 58 individuals hampered attempts to detect recidivism, a low frequency event. Another limitation was the basis of this study on an archival convenience sample. It is possible that the effects observed are unique to this specific population. If these results were to be replicated, an increased sample size consisting of randomly selected individuals from multiple different forensic settings and geographical locations would improve generalizability of the findings. Studying this recidivism phenomenon with intention would likely reduce the amount of incomplete data sets for subjects and increase overall consistency of assessment administration. The consistency of instruction given to the subjects of this sample is unknown. Moving from archival to active research would also give participants an opportunity to inquire after the results of the study and communicate with researchers and give more specific informed consent. Further research would also make it possible to expand this method of recidivism detection to an adult population, or with females.

It might also be interesting to see if even a first offence can be detected by assessing a
portion of the general population, but such research would require a much larger sample. A method that was reasonably successful with the general population could be used to target early intervention and preventative services. Another application might be to compare schools or regions to see if there are particular subpopulations that are at greater risk of criminality.

Another area that future research could improve upon would be examining variations of the method. The MMPI-A K Scale represents merely one measure of defensiveness (as does TSCC PTS Scale represent just one measure of trauma), others may prove more useful. Figure 1 suggests that both these scales suffer from range restriction, based on how recidivists are clustered near the extreme ends of possible response patterns. Similar methods (Corrado et. al., 2004; Gonzalez, 1998; and Salekin et. al., 2003) also employ measures of an “ego-strength” construct. It would seem that this is a fruitful direction for future research. Alternately, it might be possible to refine the scales used. It would be useful if a trauma scale were identified within the MMPI-A, thus eliminating the need for two different assessments to be administered. It might be possible that a better recidivism factor could be identified within the MMPI through factor analysis.

As the field of criminality matures assessments will hopefully trend towards a style similar to the one outlined above. Assessments of this type are quick and easy to administer and score. As they lack a subjective component, inter-rater reliability will likely be high. Why would one bother with a more complex and subjective assessment when an elegant and succinct method that generates similar quality results is available? At the very least, let this work represent a style guide for future researchers as they develop their own assessment methods.
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