

**DISTRIBUTION-FREE TRENDS TEST TO DETERMINE THE CONSTRUCT VALIDITY OF AN  
ANTI-SOCIAL CRIMINAL ATTITUDES SCALE**

by

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## CHAPTER 1 INTRODUCTION

### Background

MacCorquodale and Meehl (1948) set in motion a formal statistical exploration of construct validity. They illustrated that a standardized quantitative method of studying a construct and intervening variables was more effective than when less objective methods were used. This is important with regard to intervening variables, which are hypothetical conditions used to explain relationships between observed variables, such as independent and dependent variables. Researchers impute reality to inferred phenomenon based on theory and interpretations of observed facts.

In the 1950s, an American Psychological Association subcommittee proposed four different types of validity. This is the one of the first documents in which the term construct validity was used (Meehl & Challman, 1954) as it pertains to a psychometric property of a test.

Meehl and Cronbach (1955) argued for improvement in this psychometric issue and continued study of the methods for measurement of construct validity and the application of statistical methods to provide empirical data that could provide support for theoretical constructs. Subsequently, researchers began to investigate methodology for estimating convergent and discriminant validity of measures of hypothetical constructs (Campbell & Fiske, 1959). Convergent validity consists of providing evidence that two tests are

believed to measure closely related skills or types of knowledge correlate strongly. Discriminant validity consists of providing evidence that two tests do not measure closely related skills or types of knowledge do not correlate strongly. These estimates can provide statistical information regarding the role of variance due to common methods in the associations among measures of similar and different constructs (Campbell & Fiske, 1959).

Measurement experts continue to explore techniques and methods for capturing construct validity. Different approaches have been proposed on measuring construct validity (Smith, 2005; Dworkin, Burke, Maher & Gottesman, 1976; McGrath, 2005; Strauss, 2005; Westen & Rosenthal, 2005). The Multitrait-Multimethod Matrix (MTMM Matrix) by Campbell and Fiske (1959) is one of the most commonly used approaches in demonstrating evidence of construct validity (Sternberg, 1992).

In the multi-trait multi-method (MTMM) process, at least two constructs are measured to determine convergent and divergent validity of the scale in question. Each construct is measured at least two different ways, and the type of measure is repeated across constructs. For example, each construct first might be measured using a questionnaire, and then each construct would be measured using a similar set of behavioral observation categories.

After the data are collected, the MTMM matrix (see Table 1) is used to examine the associations between measures. The MTMM matrix is used to show comparison of relative strength of validity co-efficients (monotrait-

heteromethod) to other correlations for the same measure (i.e., heterotrait-monomethod) and across measures (heterotrait-heteromethod).

**Table 1**  
**Example of Campbell and Fiske's Multitrait-Multimethod Matrix**

	Trait 1 Measure 1	Trait 2 Measure 1	Trait 1 Measure 2	Trait 2 Measure 2
Trait 1 Measure 1	(.50)			
Trait 2 Measure 1	.0	(.50)		
Trait 1 Measure 2	<b>.50</b>	.0	(.50)	
Trait 2 Measure 2	.0	<b>.50</b>	.0	(.50)

### **Application in Criminology**

In most criminological theories, there are many intervening variables (Mylonas & Reckless, 1963; Gendreau, Grant, Leipziger & Collins, 1979; Andrews & Wormith, 1984; Andrews & Bonta, 1998). Researchers have been able to demonstrate that antisocial attitudes/distortions and anti-social associates are among the strongest measures currently used to predict antisocial behavior (Andrews & Bonta, 1998; Gendreau, Coggin, & Law, 1997). Cognitive distortions have been used as a construct in psychological studies for many years (Beck, 1964; Ajzen, 1988). Moreover, clinicians, including those working with correctional populations, have used cognitive therapy as a tool to rehabilitate their clients from anti-social attitudes and/or behaviors.

Although there are existing meta-analyses (e. g., Butler & Beck, 2000) and experimental research studies (e. g., Mitchell, Mackenzie, & Perez, 2005)

demonstrating the success of such therapies, measuring the changes in cognitive distortions or anti-social attitudes is less abundant (Kroner & Mills, 1998). One measure of anti-social attitudes that looks promising is the Measures of Criminal Attitudes and Associates (MCAA) scale (Mills, Kroner, & Hemmati, 2004).

The MCAA was developed by Jeremy F. Mills and Daryl G. Kroner (2001) to measure both antisocial attitudes and associates. The 46-item instrument has two-parts. The first section, Part A, is a self-report measure that quantifies a person's criminal associates while Part B uses four subscales to create a measure of antisocial attitudes. Part B is comprised of the following subscales: Attitudes towards Violence, Sentiments of Entitlement, Antisocial Intent, and Attitudes towards Associates.

The MCAA scales have predictive validity for the outcomes of general and violent recidivism (Mills & Kroner, 1999; Mills, Kroner, & Forth, 2002) and utility for recidivism or risk prediction research (Mills, Kroner, & Hemmati, 2004). Furthermore, the measure's construct validity was assessed. The authors demonstrated convergent validity between the MCAA and other validated measures of antisocial attitudes. Discriminant validity was demonstrated in the MCAA scales' lack of strong association with measures of negative affect. Specifically, the strength of the correlations between the MCAA scales and the other measures of antisocial attitudes and associates was stronger, and the range did not overlap with the correlations between the MCAA scales and the measures of negative affect.

## **Analysis of the MTMM**

In the approximately fifty years since researchers began defining construct validity (Meehl & Challman, 1954) and the multitrait-multimethod was developed (Campbell & Fiske, 1959), the MTMM still remains one of the most used techniques in demonstrating construct validity (Sternberg, 1992). However, researchers have noted several concerns with the original model of analysis for the MTMM matrix. Campbell and Fiske (1959) found in their original model that there were instances when the data within the matrix contradicted other data within the matrix making it difficult to make a clear determination of construct validity.

Various procedures for analyzing MTMM matrices have been developed in attempt to overcome problems with the original method developed by Campbell and Fiske (1959). These subsequent methods include analysis of variance (ANOVA) (Stanley, 1961), confirmatory factor analytic model (Kenny, 1976), a non-parametric comparable model of the ANOVA (Huber & Baker, 1976), path analysis (Schmitt, 1978), and exploratory factor analysis (Lomax & Algina, 1979). However, none of these models have been able to provide evidence of construct validity problem-free. For example, confirmatory factor analysis is presented as a general model allowing evaluation of the discriminant and convergent validity of MTMM matrices, both as a whole and in individual trait-method units. However, it is noted that this model is deficient with regard to analysis of trait-method interactions (Schmitt & Stults, 1996). Grayson and Marsh

(1994) showed that confirmatory factor analysis models with correlated method factors are usually under identified (Andrews, 1984; Graham, 1992; Kenny & Kashy, 1992) which may explain why these problems occur.

A more severe drawback of the standard MTMM approach is that at least three methods must be included to prevent even more severe problems of empirical under identification (Kenny, 1976); that is, every respondent is confronted with questions on the same trait three times. This poses quite a high burden for the respondent, and may also introduce memory effects that distort the validity of the model (Marsh & Hocevar, 1983).

These data issues for methods of confirming construct validity are important for researchers in the field of criminology and especially criminological assessments with the current correctional population increase. The rate of incarceration has been increasing for decades (Bureau of Justice Statistics, 2004), which has resulted in nearly seven million people under some form of correctional supervision of which almost 1.5 million are incarcerated in prison. Furthermore, an estimated 67.5% will be rearrested for a felony or serious misdemeanor within three years of their release (Bureau of Justice Statistics, 2001). With the average cost of incarcerating an adult at approximately \$33,000 per year, the need for effective rehabilitative methods has become more critical. As mentioned earlier, cognitive behavioral therapy has demonstrated effectiveness with regards to recidivism reduction (Butler & Beck, 2000; Mitchell,

Mackenzie, & Perez, 2005) but few scales exist to measure the improvement in attitude these therapies assert to target.

Again, the MCAA is one scale that looks promising (Mills & Kroner, 1999; Mills, Kroner, & Forth, 2002; Mills, Kroner, & Hemmati, 2004), however, like most of the existing assessments in this area (Gibbs, Barriga, & Potter, 200; Gendreau, Grant, Leipziger, & Collins, 1979) there are very little psychometrics conducted with minorities and women. In the American prison population, sixty-four percent (64%) of prison inmates belong to a racial or ethnic minority group (Bureau of Justice Statistics, 2002). Furthermore, there are approximately one million women under correctional supervision, about 1% of the U.S. female population and women account for 14% of all violent offenders (Bureau of Justice Statistics, 2002). Due to the large number of minorities and women incarcerated in the United States, there is a need have the same construct validated in these correctional populations.

Although there are already existing measures with peer-reviewed psychometrics that are available to measure the concept of an anti-social attitude, these proprietary scales can be expensive to non-profits and government agencies that work in the field of correctional rehabilitation. Two of the most commonly used scales today are the *How I Think* scale (Gibbs, Barriga, & Potter, 2001) and the *Criminal Sentiments* scale (Gendreau, Grant, Leipziger, & Collins, 1979). Both scales currently cost \$1.65 per assessment (20 for \$32.00) including shipping/handling costs; (Research Press Website, 2015)

## **Problem Statement**

This study is an attempt to add to the criminological literature and practice by demonstrating evidence that the MCAA measures anti-social attitudes via attitudes of entitlement, rationalization/justification, anti-social intent, and criminal associates (Mills & Kroner, 1999). It will also endeavor to provide additional statistical evidence that a distribution free test can be used in the research to determine the construct validity of a scale. A quick distribution-free test was created by Sawilowsky (2002) to obtain construct validity evidence that covers all the information found in the MTMM Matrix. Using an exact statistic, this method can provide convergent and discriminant validity which in essence is the foundation for the MTMM Matrix.

## **Assumptions**

- Anti-social attitude are clearly defined.
- Anti-social attitudes are measurable.
- Self-report scales are reliable methods of measuring anti-social attitudes.

## **Limitations**

- No random sample.
- No pre/post treatment measures.



## CHAPTER 2 REVIEW OF LITERATURE

### Construct Validity

Although an instrument may be reliable (consistency of the scores), it is just as important for an instrument to be valid to ensure it can be used for the purpose intended. Campbell and Fiske (1959, p.83) stated that, "validity is represented in the agreement between two attempts to measure the same trait though maximally different methods." Validity is the degree that an instrument measures what it was intended to measure (Jenson, 1980). Without determining the validity of an instrument, it is impossible to determine if the scale is appropriate for its intended use.

Construct validity has customarily been explained as the experimental display that a test is measuring the construct it asserts to measure (Brown, 1996). In other words, construct validity is the degree to which a test or other measure assesses the underlying theoretical construct it is supposed to measure (i.e., the test is measuring what it is purported to measure). Newman and Newman (1994) described construct validity as a combination of "all other types of validity" (p. 54). Construct validity evaluates the theoretical foundations or constructs of the instrument (Moran, 1990). One of the most complex issues when creating an assessment tool is the wide variety of definitions for any assumed construct.

In one approach, construct validity is measured by combining convergent and discriminant evidence. Convergent validity provides evidence that multiple tests or scales measure closely related skills or knowledge that

correlate strongly while discriminant validity provides evidence that they do not measure closely related skills or knowledge (Campbell & Fiske, 1959). In other words, convergent validity would be a positive correlation between a scale and construct, and discriminant validity would produce a negative correlation.

### **Early Construct Validity Measures**

Various methods have been used to demonstrate an instrument's construct validity. The most common methods have been correlational studies, exploratory factor analysis, and confirmatory factor analysis.

### **Correlational Studies**

Correlational studies typically utilize a correlation coefficient to indicate the extent of a relationship between two variables. The correlation coefficient is a number ranging from one (1 = a perfect positive correlation) through zero (0 = no relationship between the variables) to a negative one (-1 = a perfect negative correlation).

### **Multi-Trait-Multi-Method (MTMM)**

Although multi-trait multi-method (MTMM) is often cited as the best approach, due to the data analysis problems it is rarely used. In the MTMM process, at least two constructs are measured (Campbell & Fiske, 1959) in at least two different ways (e.g., a paper-and-pencil test, a direct observation, a performance measure), and the type of measures is repeated across constructs (e.g., traits A, B & C).

Then, the measures are correlated against each other in a matrix or table arranged by method. The MTMM is a symmetrical correlation matrix between the measures with the reliability of each measure along the diagonal instead of ones. Due to the fact that the matrix is symmetrical, 100% of the information may be found in either the upper or lower half of the matrix. Common themes should include (Trochim, 2006):

- A trait should be more correlated with itself than with other traits;
- Evidence of convergent validity must exist. In other words, coefficients in the validity diagonals should be significantly different than zero; and
- Trait factors should be correlated stronger than the method factors.

The main diagonal of the matrix represents the reliability of each measure independently (mono-trait-hetero-method). The validity diagonals (mono-trait-hetero-method) are the correlations between the same trait and the different methods used to measure that trait. These correlations should be reasonably correlated because in theory they are measuring the same concept. The hetero-trait mono-method triangles are composed of correlations of the same methods but different traits. The lowest correlations in the matrix should be in the hetero-trait hetero-method triangles. This is due to the fact that these correlations are between different traits and methods and, therefore, in theory should not be as highly correlated as when measuring the same trait via different methods, or different traits via the same method.

One of the greatest advantages of MTMM is this method can concurrently examine both convergent and discriminant validity (Trochim, 2006). In addition,

Campbell and Fiske (1959) asserted that it is just as important to review what is being measured with how it is being measured.

One key disadvantage of MTMM is the struggle to measure each trait presented by the same methods. Furthermore, the MTMM cannot provide a degree of construct validity in a study. In other words, how accurately the scale measures the given construct. Finally, results of the MTMM have been primarily interpreted via educated, but nonetheless subjective opinion.

### **Exploratory Factor Analysis**

Charles Spearman (1904) was the first researcher who designed a procedure for factor analysis. In his earlier years, Spearman built upon the work of Francis Galton's correlation to create the rank correlation known today as Spearman's rho. Spearman's rho is a non-parametric method to determine how strongly two variables are related. The range of rho is +1 to -1. The closer the rho value is to either endpoint, the stronger the relationship between the variables. While researching the concept of intelligence, Spearman noticed that tests scores on topics that were not related via face validity were correlated. By analyzing the correlations between variables, or factors, he was able to develop the general theory of intelligence. In the years after his discovery, variations of his original factor analysis were developed.

### **Confirmatory Factor Analytic Model**

A very popular method to determine construct validity is confirmatory factor analysis. It is important to note that due to the complex and lengthy steps

involved in the process, factor analysis was unattainable due to the lack of computers and user-friendly statistical software packages (Thompson & Dennings, 1993).

Definitions for factor analysis are quite abundant with the increasing use advances in technology. Reymont and Joreskog (1993) described it as:

Factor analysis is a generic term that we use to describe a number of methods designed to analyze interrelationships within a set of variables or objects [resulting in] the construction of a few hypothetical variables (or objects), called factors, that are supposed to contain the essential information in a larger set of observed variables or objects...that reduces the overall complexity of the data by taking advantage of inherent interdependencies [and so] a small number of factors will usually account for approximately the same amount of information as do the much larger set of original observations. (p. 71)

Factor analysis is used to 1) reduce the number of variables; and (2) to detect structure in the relationships between variables, that is to classify variables. Factor analysis assumes that the covariation in the observed variables is due to the presence of one or more latent variables (factors) that exert causal influence on these observed variables.

Confirmatory factor analysis is a model that may be used to test a predefined theory, whereas exploratory factor analysis results in generating a theory. In confirmatory factor analysis, researches must first develop a hypothetical model before the analysis. The purpose of this model is to denote how factors will relate to other factors. A strong theory is the basis of such models (Stevens, 1996). A researchers breaks down the theory into constructs (or

factors). The objective of confirmatory factor analysis is to test whether the data fits a hypothesized set of constructs.

Today, confirmatory factor analysis is executed with computer programs (Joreskog & Sorbom, 1989). Computer programs such as R, AMOS (SPSS route), LISREL, or the Hunter CFA, are used to test models against one another. Output from such programs provides the researcher with statistics to explore how each model fit the data.

The program can assist the researcher to determine if a particular model does or does not fit the existing data. If the model cannot be rejected, then the researcher could make an assumption that it could be the model that supports the causal structure (Bentler, 1980). If a proposed model is rejected then the research would determine that it could not be the cause of the observed variables.

The chief advantage of confirmatory factor analysis is that it allows you to test hypotheses about specific factor structures. Thus, the null hypothesis is the solution you specify. If the dataset you analyze departs significantly from the null hypothesis, you reject the null hypothesis and conclude that the factor structure you propose does not fit the obtained data.

### **Sawilowsky's I-Test: A New Measure for Construct Validity**

Sawilowsky (2002) developed a distribution-free quick test for trend that can be utilized to support evidence of construct validity as in the Multitrait-Multimethod Matrix. This test uses all of the information in Campbell and Fiske's

Matrix. This data is collapsed into a matrix of four levels containing the minimum, median, and maximum values of each level of the matrix. The null hypothesis for this test assumes that the values are unordered – there is no trend. The I-Test will be discussed in detail in Chapter 3.

Robustness and power properties of the Sawilowsky I-test were examined by Cuzzocrea (2007). Cuzzocrea found that as the matrix becomes larger, there was a greater chance a Type I error rate could occur. However, the results of this study also suggested that the I-Test was a more objective method than using the guidelines to analysis a Multitrait-Multimethod matrix developed by Campbell and Fiske (1959) and more conservative than other approaches such as confirmatory factor analysis where it is more challenging not to violate statistical test assumption.

### **Personality and Crime**

Over the past several decades, researchers have strived to explain why individuals become involved in criminal behavior. Two such researchers, Andrews and Bonta (1998), stated that in order to confirm the validity for any criminological theory that first one must be able predict the potential for criminal behavior using such theoretical indicators. In other words, how can a theory have a practical purpose if there is not a way to measure success? Andrews and Bonta elaborated further by affirming that once there are identified theoretical predictors then the next step is to influence criminal behavior by creating interventions tied to those predictors.

## **Anti-Social Attitudes**

For years researchers have stated that offenders have severe cognitive distortions that contribute to their delinquent behavior (Samenow, 1984; Kolberg, 1966/1969; Van Voorhis, Braswell, & Lester, 2009). In fact some researchers (Ross & Fabiano, 1985; Ross, Fabiano & Ewles, 1988) have found that there are specific cognitions related to criminality that include impulsivity, lack of concrete reasoning, lack of social perspective taking, and poor interpersonal problem solving. Some researchers have found that these anti-social cognitions are presented in childhood and are correlated with adult anti-social behavior (Moffitt, 1993; Sampson & Laub, 2005, Bouffard & Piquero, 2010; DePadilla, Elifson, Perkins, & Sterk, 2012).

Samenow (1984) was a leader in researching how thoughts impact the actions of offenders. To eliminate criminal behavior, he stated that, "criminal justice professionals must change how criminal thinks; demolish old thinking patterns, lay new foundation by teaching new concepts, and build a new structure wherein the criminal puts into action what he is taught." Other researchers, Yochelson & Samenow (1976; 1977) concluded that cognitive distortions lead to and maintain antisocial behaviors that lead to criminal behavior. Andrews & Bonta (1998) extended on this theory but looking at criminogenic attitudes.

Research suggests that cognitive behavioral interventions may offer the greatest hope in reducing the recidivism rate of offenders (Palmer, 1983;



Greenwood & Zimring, 1985; Gendreau & Ross, 1987). In 1979, Gendreau and Ross examined 95 treatment program studies with offenders performed in the 1970s and found 86% of these programs were successful. In addition, there was a range of 30% - 60% in reduction of recidivism. Some of the successful correctional programs are those that target an offender's cognitive functioning (Gendreau & Ross, 1979; Izzo & Ross, 1990). Recent evaluations of cognitive based interventions with juvenile and adult offenders that show favorable results (Garret 1984; Garrett, 1985; Andrews et al., 1990; Izzo & Ross, 1990; Lipsey, 1992; Antonowicz & Ross, 1994). Successful programs would require that offenders be taught to recognize and change their criminogenic thought patterns.

A strong example of such a program is the Cognitive Self-Change program which applied the cognitive behavioral therapy to a general population of prisoners. The Cognitive Self-Change program is based on Yochelson and Samenow (1976, 1977) theories of thinking errors within the offender population. Their theory is that offenders have a 'criminal personality' based on thinking errors. The goal of this program is to work with offenders in recognizing their thinking errors and how those thinking errors played a role in prior criminal behavior. The strategy is for offenders to receive assistance in designing interventions that target the criminogenic thought patterns and, therefore, prevent further criminal activity.

Specifically, this program was a residential program with separate living units for each participant. There were various phases of the program including

orientation, learn theory, taught to recognize distortions and techniques for self-monitoring. The program operated around groups of five to ten offenders who met three to five times/week. Each offender was required to keep a thinking report about any negative situations they were involved in and have the group help each other identify distortions. In addition, there would be role playing in the groups that involved using cognitive strategies and/or behavioral intervention. Besides the group work, each participant was given 'thinking errors homework' and was required to keep a daily journal as well as to meet regularly with treatment staff for ongoing evaluation.

Henning and Frueh (1996) evaluated this program to determine the effect of cognitive behavioral therapy on recidivism rates. To do this evaluation, the researchers used a retrospective design comparing offenders who were in the program (treatment group) to offenders who were not in the program (no treatment group). The actual samples came from a Northwest State Correctional Facility which is a medium security for males and ninety-five percent of inmates were Caucasian. This study was the largest prison in Vermont with the final sample size at 196 inmates who were referred to the program; however, offenders had the right to decide whether to participate in the program.

Recidivism was the key outcome measure and was defined as any new criminal charge within two years following release (including violations of probation/parole) that led to return to prison. Using survival analysis the

researchers found that there were significant differences in the failure curves with the treatment group demonstrating a considerable reduced rate of re-offending. The treatment group on average demonstrated a twenty-nine percent reduction in risk for re-offending.

The current study will incorporate two of principles of effective correctional treatment: emphasis on criminogenic needs and use of cognitive behavioral treatment. One of the key recommendations from this evaluation was the need to be able to target high risk offenders through a validated instrument. Basically, there was a need for an assessment that could measure the level of anti-social attitudes which in turn would help criminal justice professionals determine those offenders who were at a higher risk of re-offending. This would in turn enable criminal justice workers to channel these higher risk offenders into cognitive behavioral programs. This is due to the bulging prison population and the limited number of slots for treatment in any state prison.

Ross and Fabiano (1985) criticized the theories of Yochelson and Samenow, because of their assumption that all offenders are the same. However, Ross and Fabiano argued not all offenders have cognitive deficits. They object to Yochelson and Samenow's contention that offenders have a criminal personality characterized by deviant thinking and offenders are a homogeneous group.

It is possible cognitive deficits are most associated with persistent criminal behavior; that recidivists are the ones most likely to evidence cognitive deficits. Interpersonal problem-solving skills techniques aim to provide a general coping skill so the offender may be in a better position to understand and deal more effectively with a variety of problem situations.

The effective correctional programs reviewed by Ross and Fabiano (1985), almost without exception, included a cognitive development component; most of these programs were multifaceted so not possible to determine to what extent the positive results were attributable to the cognitive components rather than to other program factors.

One area of concern all of the researchers (Garret 1984; Garrett, 1985; Andrews et al., 1990; Izzo & Ross, 1990; Lipsey, 1992; Antonowicz & Ross, 1994) who have evaluated the impact of cognitive restructuring have found was the need to be able to target high risk offenders through a validated instrument. These assessments should measure the level of anti-social attitudes which in turn would help criminal justice professionals determine those offenders who were at a higher risk of re-offending. None of this can be shown as successful without creating risk assessments with those predictors integrated.

### **Risk Predictors**

One of the most complex and essential issues facing criminal justice professionals today is the ability to predict risk of criminal behavior. Typically in the criminal justice system risk is a key determinate in bail, sentencing, and

management decisions. Historically, gut feelings had been used to determine risk of flight or chance of violence during incarceration (CITE). In addition, many of the first developed risk assessments (CITE) used primarily static factors that inhibit the system's ability to denote changes in an offender.

Current predictors are using a mix of static and dynamic predictors based on years of research. Various researchers have found connections between criminal behavior and the following factors:

- Antisocial associates (CITE);
- Antisocial cognitions (CITE);
- Attachment (CITE);
- History of antisocial behavior (CITE);
- Indicators of antisocial personality (CITE);
- Indicators of personal school/employment achievement (CITE);
- Low verbal intelligence (CITE);
- Lower-class origins (CITE); and
- Personal distress (CITE).

The magnitude or importance related to each predictor had limited investigation in explaining future criminal behavior. Andrews and Bonta (1998) employed information from a meta-analysis conducted by Gendreau, Andrews, Goggin, and Chanteloupe (1992) in order to examine which predictors of recidivism were the strongest. The table below ranks the factors used to explain criminal behavior in order to their magnitude.

**Table 2**  
**Magnitudes of predictors of criminal behavior.**

Factor	Mean R	Number of Studies Examined
<i>Lower Social Class Origin</i>	.06	97
<i>Personal Distress/Psychopathology</i>	.08	226
<i>Vocational/Educational</i>	.12	129
<i>Parental/Family Factors</i>	.18	334
<i>Personality</i>	.21	621
<i>Anti-Social Attitudes/Associates</i>	.22	168

Individually, the best predictor in this meta-analysis is antisocial attitudes and associates followed by temperament/personality. These findings legitimize the considerable link between personality and crime. These dynamic factor as well as education and interpersonal relationships can lead researchers to develop empirically-driven risk prediction assessments.

Andrews and Bonta (2003) identified the best-validated risk factors for criminal behavior and the best predictors of recidivism (Bonta, 2002) as "the Big Four": anti-social attitudes, anti-social associates, history of antisocial behavior and anti-social personality pattern (including psychopathy, impulsivity, restless aggressive energy, egocentrism, below average intelligence, a taste for risk, poor problem solving and poor self-regulation skills).

## **Risk Assessments**

There are two main ways to assess cognitive distortions - direct (ask what thinking) and indirect (infer from behavior or performance on test). Many researchers have suggested assessing the following constructs to test for anti-social attitudes:

- self-control (vs. impulsivity);
- abstract reasoning (vs. concrete thinking);
- locus of control (internal vs. external);
- social perspective-taking (vs. egocentric thinking);
- interpersonal cognitive problem-solving;
- cognitive flexibility (vs. rigidity);
- empathy; and
- critical thinking.

When it comes to assessment, it is important to revalidate assessment instruments on different populations and over time (Hoffman and Beck, 1980).

## **Existing Scales in CJ**

There are currently several assessments used in the criminal justice system to identify anti-social attitudes. However, as mentioned earlier, a constructs such as cognitive distortions/anti-social attitudes can be defined in numerous ways, therefore, creating very different assessments on the surface. This section will review three of the most common scales to measure anti-social attitudes as well as discuss areas of concern.

Caution must be used when applying male based instruments to women (i.e. Kohlberg's moral development scale as women test out at a stage 2 or 3.) (Gilligan, 1993). Blanchette (1997) reviewed other correctional assessments on

females and found females have different thinking errors than men. Furthermore, other researchers (Funk, 1999) have found females have different risk factors (child abuse, runaway, prior detention, prior person offense) that affect their overall risk of re-offending. When Funk (1999) examined such issues, it was discovered that assessment derived from combined samples can work against women in that they can account for less variation and fail to identify most risk factors.



## CHAPTER 3 METHODOLOGY

### Research Design

This study will utilize a distribution-free test for trend which contributes evidence of construct validity. Sawilowsky (200X) developed a distribution-free quick test for trend that contributes evidence of construct validity in the Multitrait-Multimethod Matrix. This test uses the heterotrait-heteromethod, heterotrait-monomethod, and validity triangles from Campbell and Fiske's matrix as well as reliability analysis results on the study constructs. This data is collapsed into a matrix of four levels containing the minimum, median, and maximum values. Sawilowsky null hypothesis for this test assumes that the values are unordered.

### Human Subjects

The Institutional Review Board at the Wayne State University located in Detroit, MI, with an expedited approval review, gave official approval in February 2015. Once approval was obtained, participant recruitment commenced.

### Recruitment and Participation

The data will be collected via participants in the voluntary Celebrating Families! program at Bridges in Sacramento, CA. The Celebrating Families Parenting curriculum to support the parent in incorporating newly learned parenting skills and helping the parent to identify age appropriate behaviors in

their children. Celebrating Families (CF!) parenting curriculum, a curriculum listed in the Substance Abuse and Mental Health Services Administration (SAMHSA) National Registry of evidenced based programs and practices. The CF! program uses a cognitive behavioral theory model to achieve primary goals of: breaking the cycle of substance abuse, reduce substance use relapse, improve the health and well-being of children and family members, and increase healthy family functioning.

In this unique program, the entire family participates in educational groups and activities in order for both the parents and the children to recover from the damage caused by alcohol and drug addiction. Sessions begin with a healthy meal eaten in family groups; followed by 90-minute, age-appropriate, cognitive-behavioral, skill building groups; and ending with a 30 minute structured, related Family Activity.

The program strengthens family life and is comprehensive, developmentally appropriate, and relevant for diverse cultures and includes all family members. Clients are families that completed, or are near completion, of a voluntary family drug program. The families have at least one parent who is in recovery and this program offers additional support if the family is interested.

Every adult in the program is eligible to participate in this study. None of the participants are required to be there or have any outstanding criminal justice issues nor are they under criminal justice supervision. This program is strictly volunteer-based as an extra supportive service.

For a period of a month, participants will be provided a survey package containing an informational sheet describing the project and the risks/benefits to participants, the survey, and an envelope. Participants will not be required to complete this survey and the Bridges staff will not need to do anything with regards to the participant survey other than provide the survey package and answer any questions.

The staff will also be provided with an anonymous survey. They will be asked to complete for each client they meet with during this time. The survey contains three questions regarding their opinion of the client's attitude, social relationships and behavior. Once the staff completes the survey, they will drop the survey into a separate lock box created for staff surveys only.

The participant and staff surveys will be matched based upon a number at the bottom of the surveys. There is no way to identify client or staff member. Although there will be a staff survey for each client, due to whether or not the client decides to participate, there may not be a matching client survey. These non-matches will be discarded from the final analysis.

If the participant decides to participate, the survey was completed with no identifying information and placed in the provided envelope then sealed. The envelopes were then placed by the participants at their will in a survey drop box to assist in ensuring anonymity. At the end of the data collection period, the researcher collected the surveys from the drop box. Descriptions about the survey items are detailed in Table 3 below.

**Table 3: Scale Descriptions**

	<b>Method</b>				
<b>Trait</b>	MCAA	Behavioral History	Case Manager Perception	Convergent Validity Instrument	Divergent Validity Instrument
<b>Notes</b>	<i>Self-Report</i>	<i>Past Behavioral History</i>	<i>Case Manager Perception</i>	<i>Case Manager Perception</i>	<i>Individual completes</i>
Anti-Social Attitude	MCAA Entitlement subscale	COMPAS Anti-Social Attitude subscale	LSI-R Attitudes/Orientation subscale	Scale 1-10	Empathy scale
Anti-Social Peers	MCAA Associates subscale	COMPAS Past Peer Group	LSI-R Companions subscale	Scale 1-10	Social Support Scale from COMPAS
Anti-Social Behavior	MCAA Anti-Social Behavior History	Juvenile Anti-Social Behavior History	LSI-R Anti-Social Behavior History	Scale 1-10	Helping behavior scale

## **Study Measures**

### Anti-Social Attitude Measures

The following subscale for anti-social attitude (entitlement) is selected from the MCAA based upon its strength as demonstrated by the factor structure from the original MCAA development study (Mills and Kroner, 2001). Each item is presented to the respondent to either “agree” or “disagree” to the following statements:

- I should be treated like anyone else no matter what I've done;
- No matter what I've done, its only right to treat me like everyone else;
- A person should decide what they deserve out of life; and
- Only I should decide what I deserve.

An anti-social attitude subscale from the COMPAS assessment will be employed to examine anti-social attitudes as behavior. The following subscale questions were selected based upon the factor analysis from the original COMPAS development study:

- When people get in trouble with the law it is because they have no chance to get a decent job;
- When people do minor offenses or use drugs they don't hurt anyone except themselves; and
- The law doesn't help average people.

Respondents will be asked to rate their agreement to these items based

on the following Likert Scale: strongly disagree, disagree, not sure, agree, and strongly agree.

The final measure of anti-social attitudes are two items (yes or no response categories) from the LSI and include:

- The law is fair.
- I think you should always obey the law.

### Anti-Social Peers

The following items from the MCAA Criminal Associates subscale were selected to measure the respondent's connection to anti-social peers:

- None of my friends have committed crimes;
- I have friends who have been to jail;
- None of my friends has ever wanted to commit a crime; and
- I know several people who have committed crimes.

Respondents will be asked to reply with "yes" or "no" to the items above.

A second method to measure anti-social peers is from a COMPAS subscale design to determine the respondent's amount of friends who have exhibited actual criminal behavior. The respondent will be provided the following response options: none, few, half, and most for the following questions:

- How many of your past friends/acquaintances had ever been arrested?
- How many of your past friends/acquaintances had ever served time in prison?
- How many of your past friends/acquaintances were gang members?

- How many of your past friends/acquaintances took drugs regularly?

The final measure of anti-social attitudes are two items (yes or no response categories) from the LSI Companions domain and include:

- I have some criminal acquaintances.
- I have some criminal friends.

### Anti-Social Behaviors

The following items from the MCAA Violence subscale were selected to measure the respondent's anti-social behavior:

- Someone who makes you very angry deserves to be hit;
- There is nothing wrong with beating up someone who asks for it;
- It's understandable to hit someone who insults you; and
- It's all right to fight someone if they stole from you.

A second method to measure anti-social behavior is to examine an individual's anti-social behavior as a youth. Two questions are presented to measure this issue and include:

- Were you ever arrested as a juvenile under the age of 16?
- Were you ever arrested as a juvenile when you were 16 or 17?

The final measure of anti-social behavior are four items (yes or no response categories) from the LSI and include:

- Have you ever been arrested (only as an adult)?
- Have you been convicted of a crime?
- Have you ever committed a violent crime?

- Have you ever had a jail or prison sentence?

### Convergent Measures

All three convergent measures were based upon the perception of the individual's case manager. The case manager will simply be asked to respond the following item, "Please provide your professional opinion: Has this person has a history of violent behavior." The case manager can answer using of the following response categories: Yes, Unsure but likely, Unsure but Unlikely, or Definitely Not.

The case manager will also be asked to respond the following item based upon a scale of 1-10 with 1 representing "Never" and 10 meaning "All the Time":

- How often do you think this person spends time with friends/associated who are involved in criminal behaviors?

Finally, the case manager will asked to respond an item intended to measure anti-social attitudes. The following question will be asked based upon a scale of 1-10 with 1 representing "Never" and 10 meaning "All the Time":

- How often does the person exhibit an anti-social attitude?

### Divergent Measures

#### *Toronto Empathy Questionnaire (TEQ)*

Empathy is an important component of social cognition that contributes to our ability to understand and respond adaptively to others' emotions, succeed in emotional communication, and promote pro-social behavior. The Toronto Empathy Questionnaire (TEQ) will be used as a divergent measure for



anti-social attitudes. This scale, developed by Spreng, Mckinnon, Mar and Levine (2009), demonstrated high test-retest reliability ( $r=.81$ ,  $p<.001$ ).

The following TEQ items were included on the participant survey and rated on the following response choices of Never, Rarely, Sometimes, Often, and Always:

- Other people's misfortunes do not disturb me a great deal;
- I remain unaffected when someone close to me is happy;
- I do not feel sympathy for people who cause their own serious illnesses;
- I am not really interested in how other people feel; and
- I find it silly for people to cry out of happiness.

#### *Social Connectedness*

Two Items from the Social Support scale will be a divergent measure for anti-social peers. The following items are answered on a four-point Likert Scale (strongly disagree, disagree, not sure, agree, and strongly agree):

- No one knows me really well; and
- I have a healthy relationship with a significant other.

#### *Helping Behavior*

One item will measure the respondent's helping behavior which will be used as a divergent measure to anti-social behavior:

- I get a strong urge to help when I see someone who is upset.

**Assumptions**

1. Non-random, convenience sampling was used.
2. Only selected items from each survey was used to reduce the administration time to the participants. Item selected may have an impact on the findings.
3. Casual relationships are based on theory.

## CHAPTER 4 RESULTS

### Data Collection

Surveys were administered as planned in the spring of 2015. Over 65 people participating at the data collection site agreed to participate. Unfortunately, most of the staff did not complete the addendum to the survey that asked about the participant's demographics. Staff reported no one refused to participate so the sample is reflective of all of their typical participants. For all of the study constructs there was less than 8% missing rate with the exception of the COMPAS anti-social attitude scale that has a missing rate of 10.8%.

The program was able to provide a brief description of the participants who were engaged in the program during the time of the survey. The majority of participants in the program at the time of data collection were female (64.1%). The median age of participants was 33.5 years. Approximately half of all participants (48.1%) were unemployed or not in the labor force and only 34.6% had graduated high school/obtained a GED.

### Findings

#### Descriptive Statistics

Results for each of the constructs are reported in Table 2. A full breakout by item is available in Appendix B.

**Table 4**  
**Item Descriptives**

<i>Constructs</i>	<i>N</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Mean</i>	<i>Std. Deviation</i>
MCAA Anti-Social Attitude	62	0.00	1.00	0.80	0.29
COMPAS Anti-Social Attitude	58	1.00	4.33	2.24	0.71
LSI Anti-Social Attitude	60	1.00	2.00	1.33	0.33
MCAA Anti-Social Peers	60	0.25	1.00	0.84	0.20
COMPAS Anti-Social Peers	65	1.00	4.00	2.20	0.58
LSI Anti-Social Peers	62	0.00	1.00	0.70	0.40
MCAA Anti-Social Behavior	65	0.00	1.00	0.10	0.25
Youth Anti-Social Behavior	65	0.00	1.00	0.23	0.35
Adult Anti-Social Behavior	65	0.00	1.00	0.30	0.33

Both convergent and divergent measures were also analyzed. Social support, empathy, and helping behavior were included as divergent constructs (see Table 3). Almost forty percent (35.1) of respondents reported that they did not have a healthy relationship with a significant other and or knew someone who they thought knew them well. For the most part, respondents disclosed that they often feel empathy for others, but there was also a small group of people (<10%) who had trouble expressing or feeling empathy. Most respondents (93.1) answered they had some feeling of need to help someone who is upset.

**Table 5**  
**Descriptives of Divergent Constructs**

	<i>N</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Mean</i>	<i>Std. Deviation</i>
Social Support	57	1.00	5.00	3.6140	.98206
Empathy	56	1.00	4.00	2.2214	.60983
Helping Behavior	58	1	5	2.22	.992

Staff perceptions were included as convergent measures (see Table 4 for descriptive results). Staff were asked about the individual's peers, attitude and behavior. Just over half of the staff (57.8) believed that the individual spent time with other people who were involved in criminal behavior and over three-quarters (78.1%) had exhibited anti-social behavior. Over a third (36.5%) of staff reported they believed the individual was likely to commit a violent offense in the future.

**Table 6**  
**Descriptives of Convergent Constructs**

	<i>N</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Mean</i>	<i>Std. Deviation</i>
Staff Perception: Peers	64	1	9	3.63	2.313
Staff Perception: Attitude	64	1	9	2.84	2.205
Staff Perception: Anti-Social Behavior	63	1	4	2.24	.946

Staff perceptions of anti-social behavior were most correlated (see Table 5) with the MCAA anti-social peers, COMPAS anti-social peers, and adult anti-

social behavior. Staff perception of the individual's anti-social peers was statistically correlated with the MCAA anti-social peers. Finally, empathy was correlated with the LSI anti-social attitude items.

**Table 7**  
**Bivariate Correlations between Convergent and Divergent Measures with Study Constructs**

	Staff Perception: Anti-Social Behavior	Helping Behavior	Staff Perception: Attitude	Staff Perception: Peers	Empathy	Social Support
MCAA Anti-Social Attitude	.078	.158	.017	.067	-.203	-.066
COMPAS Anti-Social Attitude	.004	.106	.108	.039	.052	-.174
LSI Anti-Social Attitude	.043	-.082	-.167	-.040	<b>.435**</b>	.038
MCAA Anti-Social Peers	<b>.418**</b>	-.028	-.112	<b>.268*</b>	.161	-.073
COMPAS Anti-Social Peers	<b>.265*</b>	-.085	-.180	.034	.117	.199
LSI Anti-Social Peers	.167	-.072	-.063	-.037	.009	.007
MCAA Anti-Social Behavior	.097	.168	.064	-.062	-.082	-.076
Youth Anti-Social Behavior	.074	-.057	-.155	.137	-.125	-.245
Adult Anti-Social Behavior	<b>.400**</b>	.158	.114	.242	.009	-.021

\*Correlation is significant at the 0.05 level (2-tailed).

\*\*Correlation is significant at the 0.01 level (2-tailed).

c=Convergent validity

d=Divergent validity

### **The I-Test**

The first step with the I-test was to run Pearson bivariate correlations between the study constructs (see Table 8). Very few statistically significant correlations were discovered. Reported adult criminal behavior was correlated with MCCA anti-social peers (.333,  $p < 0.01$ ), COMPAS anti-social peers (.369,  $p < 0.01$ ), and youth anti-social behavior (.445,  $p < 0.01$ ). COMPAS anti-social peers was also correlated with LSI anti-social attitude (.310,  $p < 0.05$ ). The COMPAS anti-social attitude scale was correlated with the MCAA anti-social behavior scale (.506,  $p < 0.01$ ). Finally, the MCAA anti-social peers scale was correlated with the LSI anti-social attitude items (.315,  $p < .05$ ).

**Table 8**  
**MMMT Matrix**

	MCAA Attitude	COMPAS Attitude	LSI Attitude	MCAA Peers	COMPAS Peers	LSI Peers	MCAA Anti-Social Behavior	Youth Anti-Social Behavior	Adult Anti-Social Behavior
MCAA Attitude	1	0.049	-0.003	-0.013	-0.028	-0.176	0.219	-0.075	0.179
COMPAS Attitude	0.049	1	0.161	-0.051	-0.028	0.147	.506**	-0.068	0.025
LSI Attitude	-0.003	0.161	1	.315*	0.212	0.128	0.076	-0.208	-0.024
MCAA Anti-Social Peers	-0.013	-0.051	<b>.315*</b>	1	.310*	0.128	0.017	0.186	.333**
COMPAS Anti-Social Peers	-0.028	-0.028	0.212	.310*	1	.358**	0.153	0.142	.369**
LSI Anti-Social Peers	-0.176	0.147	0.128	0.128	<b>.358**</b>	1	0.189	-0.02	-0.076
MCAA Anti-Social Behavior	0.219	<b>.506**</b>	0.076	0.017	0.153	0.189	1	0.109	0.125
Youth Anti-Social Behavior	-0.075	-0.068	-0.208	0.186	0.142	-0.02	0.109	1	.445**
Adult Anti-Social Behavior	0.179	0.025	-0.024	<b>.333**</b>	<b>.369**</b>	-0.076	0.125	<b>.445**</b>	1

\*Correlation is significant at the 0.05 level (2-tailed).

\*\*Correlation is significant at the 0.01 level (2-tailed).



The next step in the I-Test is to run reliability analysis on the study constructs (see Table 9). The strongest scales included the items from the MCAA anti-social behavior (4 items;  $\alpha = .875$ ), COMPAS Anti-Social Peers (4 items;  $\alpha = .778$ ), MCAA anti-social attitude (4 items;  $\alpha = .767$ ) and adult anti-social behavior (4 items;  $\alpha = .731$ ).

**Table 9**  
**Scale Reliabilities**

<i>Scale</i>	<i>Reliability</i>
<i>MCAA Anti-Social Behavior</i>	<i>.875</i>
<i>COMPAS Anti-Social Peers</i>	<i>.778</i>
<i>MCAA Anti-Social Attitude</i>	<i>.767</i>
<i>Adult Anti-Social Behavior</i>	<i>.731</i>
<i>LSI Anti-Social Peers</i>	<i>.666</i>
<i>Youth Anti-Social Behavior</i>	<i>.565</i>
<i>LSI Anti-Social Attitude</i>	<i>.463</i>
<i>COMPAS Anti-Social Attitude</i>	<i>.414</i>
<i>MCAA Anti-Social Peers</i>	<i>.344</i>

Once the reliability analysis and Person correlation are calculated, the results are compiled in a table (see Table 10) that lists the minimum, median and maximum score for the reliability analysis results and the validity, heterotrait-heteromethod and heterotrait-monomethod diagonals of the MTMM matrix.

**Table 10**  
**I Test for Increasing Trend**

Level	Minimum		Median		Maximum	
	Value	I	Value	I	Value	I
Reliability	.344	0	.615	0	.875	0
Validity	-.013	0	-.076	0	.219	0
H-M	-.003	0	.128	2	.445	4
H-H	-.208	3	.150	4	.506	7

Next the number of inversions are then calculated for each value in the I-Test matrix by starting with the first number on a line, and then going to the line above it and counting how many values are lower than the value of interest. Figure 1 below demonstrates this process. The value (.445) identified with a square is the value of interest. The value on the lines above (in this example, includes the reliability and validity levels) are examined to see how many values are lower than the value of interest. In this example, all three validity values are lower than the value of interest and one value in the reliability level. The values that are lower than the value of interest (n=4) are shown with ovals in the table. This means that there are four values that we would expect to be lower than the value of interest.

**Figure 1: Example of How to Calculate Inversions in Trends**

Level	Minimum		Median		Maximum	
	Value	I	Value	I	Value	I
Reliability	.344	0	.615	0	.875	0
Validity	-.013	0	-.076	0	.219	0
H-M	-.003	0	.128	2	.445	4
H-H	-.208	3	.150	4	.506	7

This process is repeated with each value in Table 10. Once each value has the corresponding inversions counted, all the inversions are then added up to create a score for the I-Test statistic. In total, there were 20 inversions in Table 10 (I-Test=20).

If there was a strong evidence for construct validity, there would be values that increase in order from the bottom row (heterotrait-heteromethod) to the higher rows (reliability). In other words, the expectation is the heterotrait-heteromethod (bottom row) would have lower values than the rows above because heterotrait-heteromethod are different traits and different methods whereas there would be an expectation that the reliability of the individual scales would be stronger since they are design to measure the same construct within the same scale and method. This expectation of trend is the basis of how the MTMM matrix is interpreted as described by Campbell and Fisk (1959). Sawilowsky has gone a step further to take out the subjective nature and created critical values for deciding whether construct validity is demonstrated.

Sawilowsky's developed the Cumulative Distribution Functions (CDF) table to allow for interpretation of the I-Test statistic provides values to determine if the test for trends is significant. The first step in creating the CDF was to determine a complete set of possible permutations using a Fortran 90/95 program. Then the CDF critical values (p value) were defined by dividing the number of times each inversion could occur by the number of overall possible inversions. Figure X

displays the number of inversions and the corresponding critical value (p value) as depicted in Sawilowsky's 2002 article.

**Figure 2: Cumulative Distribution Function (CDF) Critical Values**

<i>I</i>	CDF	<i>I</i>	CDF	<i>I</i>	CDF	<i>I</i>	CDF	<i>I</i>	CDF
0	0.00000271	11	0.01228896	22	0.26589286	33	0.81770563	44	0.99501894
1	0.00001082	12	0.01834416	23	0.31360119	34	0.85284904	45	0.99701299
2	0.00003517	13	0.02656926	24	0.36446699	35	0.88336580	46	0.99829004
3	0.00009470	14	0.03744318	25	0.41769751	36	0.90932900	47	0.99907197
4	0.00022186	15	0.05145292	26	0.47239719	37	0.93094426	48	0.99952922
5	0.00047078	16	0.06905574	27	0.52760281	38	0.94854708	49	0.99977814
6	0.00092803	17	0.09067100	28	0.58230248	39	0.96255682	50	0.99990530
7	0.00170996	18	0.11663420	29	0.63553300	40	0.97343074	51	0.99996483
8	0.00298701	19	0.14715097	30	0.68639880	41	0.98165584	52	0.99998918
9	0.00498106	20	0.18229437	31	0.73410714	42	0.98771104	53	0.99999729
10	0.00796807	21	0.22197240	32	0.77802759	43	0.99203193	54	1.00000000

The *I* value of 20 from this study corresponds with a CDF value of .18229437 which means that null hypothesis of no trend cannot be rejected and no statistically evidence of construct validity exists.

## CHAPTER 5 CONCLUSION

The purpose of this study was to test a new method for determining construct validity using a non-parametric method. No statistical evidence for the MCAA scale was found. However, as discussed in the next section, there were some limitations in this current study so the results should be interpreted carefully.

### **Study Limitations**

The results of this study should be treated with caution because there were some limitations. First, only selected items from each of the full scales in the study were used. After looking at the reliability analysis, there were some issues with the items selected for LSI anti-social attitude (2 items,  $\alpha=.463$ ), COMPAS anti-social attitude (3 items,  $\alpha=.414$ ), and MCAA anti-social peers (4 items,  $\alpha=.344$ ). It is unclear why these reduced scales had lower reliability scores. For example, the four items that comprised of the MCAA anti-social peers scale for this study were the four items with the highest loadings in a sorted orthogonal Procrustes rotated loadings (see Table 11) conducted on all of the items on the MCAA (MCAA User Guide, 2001). Perhaps using the Pearson-Brown reliability estimate in future studies might help account for the small number of items and possible impact of the small number of items.

**Table 11**  
**Factor Loadings for the MCAA Anti-Social Peer Items**

Question	Factor Loading
<i>None of my friends have committed crimes;</i>	.807
<i>I have friends who have been to jail;</i>	.796
<i>None of my friends has ever wanted to commit a crime; and</i>	.760
<i>I know several people who have committed crimes</i>	.698

One possible impact was the demographics of the respondents. Perhaps the sample in this study was different than the original MCAA study. However, due to the lack of demographics results, it is unknown what impact gender, race, ethnicity, age, and other factors had on the results. For example, there was some feedback after the administration of the survey that some survey questions may not have been culturally sensitive. Two items in particular are from the LSI anti-social attitude scale, "The law is fair" and one from the COMPAS anti-social attitude scale, "The law doesn't help average people." For many of the respondents, they may have had experience with the law they feel is not applied equally across gender, race, or ethnicity. This issue is often researched and discussed within the criminal justice arena and is most apparent in the disproportionate levels of minorities in the criminal justice system.

Another consideration would be the study population. Although there was no coercion for respondent to participate, there is always unspoken power differential between a client and a provider of a social service. It is possible that

some clients were nervous about answering honestly in concern for losing services or having any anti-social behaviors reported.

Readability is another factor. Some staff members reported that some participants struggled with negatively worded questions. In addition, some participants are in early recovery from drug use and still have affected executive functioning making a survey like the one in this study difficult to follow.

### **Conclusions**

The Sawilowsky I-test has the potential for testing construct validity in studies with criminal populations. Often random sample in studies with these populations are not possible and in some instance are no longer allowed by policy. There were some inherent issues with this study including lack of demographics and some issues with the developed truncated scales, and although this findings did not support construct validity, there was some potential ( $CDF=.18$ ) for evidence of construct validity. Future studies should include demographics and consider using the expanded scales as they were originally developed.

## APPENDIX A: Study Survey

### Survey Introduction:

**Thank you** for agreeing to help with this dissertation project. Again, no one will see your responses but me and there is no way to link your survey to you. This is completely anonymous.

Below is a list of statements. Please read each statement carefully and rate how frequently you feel or act in the manner. There are no right or wrong answers or trick questions. Please answer each question as honestly as you can.

### Survey Items:

#### MCAA Anti-Social Attitude

- I should be treated like anyone else no matter what I've done.
- No matter what I've done, it's only right to treat me like everyone else.
- A person should decide what they deserve out of life.
- Only I should decide what I deserve.

#### MCAA Anti-Social Peers

- None of my friends have committed crimes.
- I have friends who have been to jail.
- None of my friends has ever wanted to commit a crime.
- I know several people who have committed crimes.

#### MCAA Anti-Social Behavior

- Someone who makes you very angry deserves to be hit.
- There is nothing wrong with beating up someone who asks for it.
- It's understandable to hit someone who insults you.
- It's all right to fight someone if they stole from you.

#### Adult Anti-Social Behaviors

- Have you ever been arrested (only as an adult)?
- Have you been convicted of a crime?
- Have you ever committed a violent crime?
- Have you ever had a jail or prison sentence?

#### LSI Anti-Social Attitude

- The law is fair.
- I think you should always obey the law.



LSI Anti-Social Peers

- I have some criminal acquaintances.
- I have some criminal friends.

Youth Anti-Social Behavior

- Were you ever arrested as a juvenile under the age of 16?
- Were you ever arrested as a juvenile at the age of 16 or 17?

COMPAS Anti-Social Peers

- How many of your past friends/acquaintances had ever been arrested?
- How many of your past friends/acquaintances had ever served time in prison?
- How many of your past friends/acquaintances were gang members?
- How many of your past friends/acquaintances took drugs regularly?

COMPAS Anti-Social Attitudes

- When people get not trouble with the law it is because they have no chance to get a decent job.
- When people do minor offenses or use drugs they don't hurt anyone except themselves.
- The law doesn't help average people.

Social Support

- No one knows me really well.
- I have a healthy relationship with a significant other.

Empathy

- Other people's misfortunes do not disturb me a great deal.
- I remain unaffected when someone close to me is happy.
- I do not feel sympathy for people who cause their own serious illnesses.
- I am not really interested in how other people feel.
- I find it silly for people to cry out of happiness.

Helping Behavior

- I get a strong urge to help when I see someone who is upset

## APPENDIX B: Data Tables

### Item Descriptives

	N	Minimum	Maximum	Mean	Std. Deviation
<i>I should be treated like anyone else no matter what I've done.</i>	65	0	1	.91	.292
<i>No matter what I've done, it's only right to treat me like everyone else.</i>	65	0	1	.88	.331
<i>A person should decide what they deserve out of life.</i>	64	0	1	.81	.393
<i>Only I should decide what I deserve.</i>	63	0	1	.60	.493
<i>None of my friends have committed crimes.</i>	64	0	1	.86	.350
<i>I have friends who have been to jail.</i>	62	0	1	.77	.422
<i>None of my friends has ever wanted to commit a crime.</i>	63	0	1	.87	.336
<i>Someone who makes you very angry deserves to be hit.</i>	65	0	1	.09	.292
<i>There is nothing wrong with beating up someone who asks for it.</i>	65	0	1	.06	.242
<i>It's understandable to hit someone who insults you.</i>	65	0	1	.14	.348
<i>It's all right to fight someone if they stole from you.</i>	65	0	1	.11	.312
<i>The law is fair.</i>	61	0	1	.44	.501
<i>I think you should always obey the law.</i>	64	0	1	.91	.294
<i>I have some criminal acquaintances.</i>	64	0	1	.70	.460
<i>I have some criminal friends.</i>	62	0	1	.69	.465

Were you ever arrested as a juvenile <u>under</u> the age of 16?	65	0	1	.23	.425
Were you ever arrested as a juvenile at the age of 16 or 17?	65	0	1	.23	.425
Have you ever been arrested (only as an adult)?	65	0	1	.26	.443
Have you been convicted of a crime?	65	0	1	.48	.503
Have you ever had a jail or prison sentence?	65	0	1	.29	.458
Have you ever committed a violent crime?	65	0	1	.17	.378
How many of your past friends/acquaintances had ever been arrested?	65	1	4	2.32	.687
How many of your past friends/acquaintances had ever served time in prison?	65	1	4	1.92	.692
How many of your past friends/acquaintances were gang members?	65	1	4	1.74	.735
How many of your past friends/acquaintances took drugs regularly?	65	1	4	2.82	.934
When people get not trouble with the law it is because they have no chance to get a decent job.	58	1	5	2.21	.987
When people do minor offenses/or use drugs they don't hurt anyone except themselves.	58	1	5	2.14	1.235
The law doesn't help average people.	58	1	5	2.36	.931

<i>No one knows me really well.</i>	58	1	5	3.52	1.287
<i>I have a healthy relationship with a significant other.</i>	57	1	5	3.72	1.306
<i>Other people's misfortunes do not disturb me a great deal.</i>	58	1	5	2.67	1.082
<i>I remain unaffected when someone close to me is happy.</i>	57	1	5	2.25	1.106
<i>I do not feel sympathy for people who cause their own serious illnesses.</i>	58	1	6	2.36	1.087
<i>I am not really interested in how other people feel.</i>	57	1	5	2.18	1.071
<i>I find it silly for people to cry out of happiness.</i>	58	1	5	1.71	1.108
<i>I get a strong urge to help when I see someone who is upset</i>	58	1	5	2.22	.992
<i>S_ASattitude</i>	64	1	9	2.84	2.205
<i>S_ASfriends</i>	64	1	9	3.63	2.313
<i>Staff violence recoded</i>	63	1	4	2.24	.946

Bivariate Correlations between Study Constructs and Divergent and Convergent Measures

		MCAA Attitude	COMPAS Attitude	LSI Attitude	MCAA Peers	COMPAS Peers	LSI Peers	MCAA Anti-Social Behavior	Youth Anti- Social Behavior	Adult Anti- Social Behavior
<i>attitude_MCAA</i>	Pearson Correlation	1	0.049	-0.003	-0.013	-0.028	.176	0.219	-0.075	0.179
	Sig. (2-tailed)		0.722	0.98	0.921	0.832	0.178	0.087	0.562	0.163
	N	62	56	60	59	62	60	62	62	62
<i>attitudes_COMPAS</i>	Pearson Correlation	0.049	1	0.161	-0.051	-0.028	0.147	.506**	-0.068	0.025
	Sig. (2-tailed)	0.722		0.245	0.709	0.835	0.281	0	0.614	0.854
	N	56	58	54	55	58	56	58	58	58
<i>attitude_LSI</i>	Pearson Correlation	-0.003	0.161	1	.315*	0.212	0.128	0.076	-0.208	-0.024
	Sig. (2-tailed)	0.98	0.245		0.017	0.104	0.339	0.563	0.112	0.858
	N	60	54	60	57	60	58	60	60	60
<i>peers_MCAA</i>	Pearson Correlation	-0.013	-0.051	.315*	1	.310*	0.128	0.017	0.186	.333**
	Sig. (2-tailed)	0.921	0.709	0.017		0.016	0.34	0.898	0.155	0.009
	N	59	55	57	60	60	58	60	60	60
<i>peers_Selfreport</i>	Pearson Correlation	-0.028	-0.028	0.212	.310*	1	.358**	0.153	0.142	.369**
	Sig. (2-tailed)	0.832	0.835	0.104	0.016		0.004	0.222	0.26	0.003
	N	62	58	60	60	65	62	65	65	65

<i>peers_LSI</i>	Pearson Correlation	-0.176	0.147	0.128	0.128	.358**	1	0.189	-0.02	-0.076
	Sig. (2-tailed)	0.178	0.281	0.339	0.34	0.004		0.141	0.878	0.555
	N	60	56	58	58	62	62	62	62	62
<i>violence_MCAA</i>	Pearson Correlation	0.219	.506**	0.076	0.017	0.153	0.189	1	0.109	0.125
	Sig. (2-tailed)	0.087	0	0.563	0.898	0.222	0.141		0.388	0.322
	N	62	58	60	60	65	62	65	65	65
<i>youth_LSI</i>	Pearson Correlation	-0.075	-0.068	-0.208	0.186	0.142	-0.02	0.109	1	.445**
	Sig. (2-tailed)	0.562	0.614	0.112	0.155	0.26	0.878	0.388		0
	N	62	58	60	60	65	62	65	65	65
<i>adult_LSI</i>	Pearson Correlation	0.179	0.025	-0.024	.333**	.369**	-0.076	0.125	.445**	1
	Sig. (2-tailed)	0.163	0.854	0.858	0.009	0.003	0.555	0.322	0	
	N	62	58	60	60	65	62	65	65	65

Bivariate Correlations between Study Constructs and Divergent and Convergent Measures

		Staff Perception: Anti-Social Behavior	Helping Behavior	Staff Perception: Attitude	Staff Perception: Peers	Empathy	Social Support
MCAA Anti- Social Attitude	Pearson Correlation	.078	.158	.017	.067	-.203	-.066
	Sig. (2- tailed)	.556	.245	.898	.610	.141	.630
	N	60	56	61	61	54	55
COMPAS Anti- Social Attitude	Pearson Correlation	.004	.106	.108	.039	.052	-.174
	Sig. (2- tailed)	.977	.426	.422	.776	.703	.195
	N	56	58	57	57	56	57
LSI Anti- Social Attitude	Pearson Correlation	.043	-.082	-.167	-.040	.435	.038
	Sig. (2- tailed)	.750	.556	.207	.766	.001	.786
	N	58	54	59	59	52	53
MCAA Anti- Social Peers	Pearson Correlation	.418	-.028	-.112	.268	.161	-.073
	Sig. (2- tailed)	.001	.840	.399	.040	.248	.602
	N	58	55	59	59	53	54

COMPAS Anti- Social Peers	Pearson Correlation	.265	-.085	-.180	.034	.117	.199
	Sig. (2- tailed)	.035	.524	.154	.792	.392	.137
	N	63	58	64	64	56	57
LSI Anti- Social Peers	Pearson Correlation	.167	-.072	-.063	-.037	.009	.007
	Sig. (2- tailed)	.203	.597	.627	.779	.950	.959
	N	60	56	61	61	55	55
MCAA Anti- Social Behavior	Pearson Correlation	.097	.168	.064	-.062	-.082	-.076
	Sig. (2- tailed)	.451	.206	.615	.625	.546	.574
	N	63	58	64	64	56	57
Youth Anti- Social Behavior	Pearson Correlation	.074	-.057	-.155	.137	-.125	-.245
	Sig. (2- tailed)	.565	.671	.222	.279	.361	.066
	N	63	58	64	64	56	57
Adult Anti- Social Behavior	Pearson Correlation	.400	.158	.114	.242	.009	-.021
	Sig. (2- tailed)	.001	.235	.370	.054	.946	.877
	N	63	58	64	64	56	57



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**ABSTRACT****DISTRIBUTION-FREE TRENDS TEST TO DETERMINE THE CONSTRUCT VALIDITY OF AN ANTI-SOCIAL CRIMINAL ATTITUDES SCALE**

by

**HOLLY ANN CHILD****May 2016****Advisor:** Dr. Shlomo Sawilowsky**Major:** Evaluation and Research**Degree:** Doctor of Philosophy

The Sawilowsky's I-Test was developed to as an alternative method to evaluate construct validity, more specifically, in regards to the Multitrait-Multimethod Matrix designed by Campbell and Fiske (1959). Typically, researchers use a method by Campbell and Fiske that involves a subjective "physical" look at the matrix to determine validity. Sawilowsky's I-Test offers a statistical approach that incorporates the current practice but removes the subjectivity involved in this process.

There are only two existing studies that look at the I-Test, Sawilowsky in 2002 and Cuzzocrea in 2007. Both studies found that although the I-Test is not a perfect statistic, it provides an objective method to analyze a Multitrait-Multimethod Matrix when looking at construct validity. Neither of these studies used raw data to test this statistic. This study collected data in attempt to use a

“real world” application of this statistics and provide additional research on this statistic’s potential application.

The Sawilowsky I-test has the potential for testing construct validity in studies with criminal populations. Although this findings did not support construct validity, there was some potential (CDF=.18) for evidence of construct validity. Future studies should include demographics and consider using the expanded scales as they were originally developed.

## AUTOBIOGRAPHICAL STATEMENT

### HOLLY ANN CHILD

#### BACKGROUND

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Dr. Child who has over 15 years of experience working with non-profit and government agencies on action planning and program improvement and through evaluation, training, and technical assistance. Her previous research and publication has focused on criminal justice systems and programming, collaborative problem-solving courts, youth prevention programs, substance use treatment programs, child welfare interventions, and other preventive or diversion-type programs.

#### PROFESSIONAL EXPERIENCE

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*Senior Research Analyst II* San Jose, CA, 2015 – Present  
**Applied Survey Research**

*Evaluation Program Manager/Research Associate* Lake Forest, CA, 2010-2015  
**Children and Family Futures**

*Department Chair/Assistant Professor* Saginaw, MI, 2006-2010  
**Saginaw Valley State University, Dept. of Criminal Justice**

*Research Analyst/Director of the Crime and Justice and Community Development Units* Detroit, MI, 2002-2006  
**Center for Urban Studies, Wayne State University**

*Research Associate* Cincinnati, OH, 1999-2002  
**Criminal Justice Research Center (CJRC),**  
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#### EDUCATION

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Master of Science, **Criminal Justice** Degree Awarded 1999  
 University of Central Florida | Orlando, FL

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