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## Dark Side Personality IATS: Development of Non-Bipolar Valence-Balanced Implicit Measures

Benjamin J. Thomas

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**DARK SIDE PERSONALITY IATS:  
DEVELOPMENT OF NON-BIPOLAR VALENCE-BALANCED IMPLICIT  
MEASURES**

A Masters Thesis

Presented to

The Graduate College of

Missouri State University

In Partial Fulfillment

Of the Requirements for the Degree

Master of Science, Psychology

By

Benjamin Thomas

May 2015

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## **DARK SIDE PERSONALITY IATS:**

### **DEVELOPMENT OF NON-BIPOLAR VALENCE-BALANCED IMPLICIT MEASURES**

Psychology

Missouri State University, May 2015

Master of Science

Benjamin Thomas

#### **ABSTRACT**

Predicting character failure is a challenging risk management problem in many organizations and, while self-report measures of attitudes, beliefs, and personality traits have proven useful, room for improvement remains. Measures using Implicit Association Test (IAT) procedures appear to have some promise in this regard because, unlike self-report measures, they are resistant to impression management artifacts and independent of introspective ability or self-knowledge. Adjectives related to maladaptive personality attributes were used to develop IATs that are balanced with respect to an evaluative dimension (good—bad) in order to not confound self-esteem with semantically distinct descriptors of behavioral tendencies. Although correlations with an established self-report measure, the Levenson Self-Report Psychopathy Scale (Levenson, Kiehl, & Fitzpatrick, 1995), indicate some evidence of convergent and discriminant validity, reliability coefficients indicate the IATs are contaminated with measurement error. Problems with these basic psychometric properties suggest directions for future work in order to realize the full potential of these measures.

**KEYWORDS:** counterproductive work behavior, dark side personality traits, psychopathy, integrity measures, implicit association test, five factor model of personality.

This abstract is approved as to form and content

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Donald L. Fischer, PhD  
Chairperson, Advisory Committee  
Missouri State University

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May 2015

Approved:

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Chairperson, Donald L. Fischer, PhD

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Robert G. Jones, PhD

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Michelle E. Visio, PhD

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Julie Masterson, PhD: Dean, Graduate College

## **ACKNOWLEDGEMENTS**

I cannot overstate the importance of Dr. Donald Fischer, not only in this project, but in his selfless guidance throughout my research experience with him. Similarly the faculty at Missouri State, both within the psychology department and beyond who have endowed me with confidence and experiential wisdom, deserve more praise and admiration than we students often express.

Thank you to my family, for their provisions of security, certainty, oddity, and warmth throughout my life and education. A special thanks to my grandparents, my favorite employer and my dearest source of sustenance. I dedicate this thesis to those whose efforts equipped and enabled my own progress.

## TABLE OF CONTENTS

Introduction.....	1
Explicit Measures.....	2
Implicit Measures.....	4
Dark Side Personality Traits .....	6
Hypotheses .....	11
Method .....	13
Measures .....	13
Participants.....	16
Procedure .....	16
Results .....	17
Descriptive Statistics.....	17
Test of Hypotheses.....	17
Discussion .....	19
Construct Validation Evidence .....	19
Limitations and Implications for Future Research .....	20
References.....	22

## LIST OF TABLES

Table 1: Schematic Overview of the Implicit Association Test.....	25
Table 2 Concept Labels and Word Stimuli for All Implicit Association Tests .....	26
Table 3: Mean Valence Ratings for IATs and Concepts .....	27
Table 4: Descriptive Statistics for Study Variables .....	28
Table 5: Zero-Order Correlations for Study Variables .....	29



## INTRODUCTION

Managing risks related to character failure and integrity in the work place is a chronic problem for employers (Berry, Sackett & Wiemann, 2007; Hogan & Hogan, 2001; Organ & McFall, 2004). Accurate assessment is at the core of this problem – it is necessary to know who is at risk of character failure in order to intervene. Accurately measuring psychological attributes that put individuals at risk of character failure has its own history of problems (Van Iddekinge, Roth, Raymark, & Odle-Dusseau, 2012). The most common approaches use explicit methods based on self-reports, which are susceptible to impression management and self-knowledge artifacts.

Recent efforts have used implicit methods like the Implicit Association Test (IAT) because of its resistance to these artifacts. For example, Fischer and Bates (2008) developed IAT measures of constructs defined by what Greenwald, Banaji, Rudman, Farnham, Nosek, and Mellot (2002) call a Balanced Identity Design and found considerable support for the IAT measures' construct validity. The implicit measures conformed better with the predictions of cognitive consistency theory (Festinger, 1957; Heider, 1958) than did conventional explicit measures. Building on these findings, Fischer, Osafo and Turner (2010) and Fischer, Thompson and Turner (2012) showed that IAT measures incrementally improved the prediction of overt behaviors related to integrity and character – behaviors like following or breaking rules and lying or telling the truth.

However, the accuracy of prediction afforded by the combination of IATs with established explicit measures fell far short of what is desired, with over 75% of the variance in the criterion measures remaining unpredicted. The purpose of this research is

to improve upon the prediction these measures provide by developing IATs that are based upon traits related to “dark side” personality syndromes – traits related to psychopathy, narcissism, and Machiavellianism.

### **Explicit Measures**

Explicit integrity measures can be organized into two categories: labeled “overt” and “personality-oriented” tests (Sackett, Burris & Callahan, 1989). Overt measures assess respondents’ feelings and attitudes about theft and honesty, their admissions of theft and other wrongdoing, and their beliefs about the prevalence of this conduct. Common examples include the Personnel Selection Inventory (Moretti & Terris, 1983) and the Reid Report (Cunningham, Wong, & Barbee, 1994). Personality-oriented measures are not aimed explicitly at theft, but are more linked to normal-range personality. Common integrity measures include the Sociability scale of the California Psychological Inventory (CPI) and the Reliability scale of the Hogan Personality Inventory (HPI).

Overt measures, like the Reid Report, are theoretically founded on the projective and punitive hypotheses. According to Cunningham, et al. (1994), the punitive hypothesis suggests “honest individuals tend to hold themselves to high standards of personal conduct and are relatively harsh toward those who commit crimes or act dishonestly in other ways” (pp. 643-644). Items assessing this factor might ask the subject to agree/disagree with the termination of an employee as a result of a harmless theft. Someone who scores high on integrity would be likely to indicate the employee should be discharged. The projective hypothesis suggests honest individuals believe other people to

be equally honest. A dishonest individual would be more likely to rate a public official as dishonest, for example.

Personality-based measures invoke theories about the effective socialization of children and the development of ego-strength. Socialization refers to internalization of social values, and is commonly placed on a continuum, running from those exhibiting deviant behaviors at one end, to those who accept convention and exercise self-restraint at the other (Gough, 1960). The Socialization scale of the CPI assesses “the degree of social maturity, integrity, and rectitude which the individual has attained” (p. 24).

Loevinger (1966) described stages of ego development in terms of impulse control and character development. Items on personality-based measures typically address one’s social insensitivity, thrill-seeking impulsiveness, anomie, and hostility towards rules and authority (Hogan & Hogan, 1989). For example, agreeing with the question, “Did you get in trouble very often with your teachers in high school?” and disagreeing with the question “Do you look up to your father as an ideal man?” would indicate a higher risk of character failure and counterproductive work behavior (CWB).

Meta-analytic studies indicate both types of explicit measures can be useful in managing risks related to CWBs (Ones, Viswesvaran, & Schmidt, 1993). While the mean criterion-related validity of overt tests is higher ( $r = 0.55$ ,  $SD = 0.41$ ) than that of personality-based tests ( $r = 0.32$ ,  $SD = 0.11$ ), personality-based measures appear to be less susceptible to unsystematic error. Van Iddekinge, et al. (2012) recently conducted a meta-analysis of integrity measures, and caution that the criterion-related validity of available integrity tests is moderated by the source of the criterion: “Corrected validity estimates are notably larger when CWB is measured using self-reports (.42) than when it is

measured using other-reports (.11) or employee records (.15)” (p. 518). In studies that utilize what the authors deemed “the most relevant validity evidence for integrity tests and CWB” (p. 518), validity estimates are much more modest (0.13).

### **Implicit Measures**

Implicit social cognition is defined as cognitions, feelings and evaluations that are not necessarily available to conscious awareness, conscious control, conscious intention, or self-reflection (Greenwald & Banaji, 1995). The IAT was developed by Greenwald, McGhee and Schwartz (1998) to measure a number of implicit social knowledge structure constructs, including attitudes, stereotypes, and self-constructs. The IAT is a computer-based assessment that uses reaction times on classification tasks to assess the strength of associations between pairs of concepts and attributes – the quicker the reaction time, the stronger the association. The IAT score (also called an IAT effect) is a function of the difference between the mean reaction times of reverse pairings of concepts and attributes. In the prototypic IAT, the target concepts of “flowers” and “insects” were paired with the attributes of “good” and “bad” according to the schematic displayed in Table 1.

Exemplars of the concepts and attributes (images or words) are presented one at a time on the computer screen. Respondents classify these by pressing an assigned key on the keyboard. The larger the difference between the mean reaction times for stages four and seven in Table 1, the stronger the association of flowers with good (and insects with bad) and the greater the IAT effect.

**Balanced identity designs.** The Balanced Identity Design (BID) offers a way of studying the predictions of classic cognitive consistency theory (Festinger, 1957; Heider, 1958), as these apply to social knowledge structures (Greenwald, et al., 2002). In the BID, a set of three related IATs are created using the combinations of a self-other contrast (e.g., me—not-me) with a social category contrast (e.g., male—female), and an attribute contrast (e.g., good—bad). According to the Unified Theory of Implicit Social Cognition (UT), Greenwald et al. (2002) predict the interdependence of the three associations defined in a BID. In other words, any one of the three target constructs in a person’s social knowledge structure – like one’s stereotypic conception of group members (the group-attribute association) – should be predicted by the interaction of the other two (the strength of the self-attribute association and group identity). So, a person with a stronger group identity (“I’m just like most other men”) coupled with a stronger self-attribute association (“I’m a good person”) is likely to have a stronger group-attribute stereotype (“men are generally good people”). Greenwald et al. (2002) present data involving gender, race and age in which the predictions of UT are more evident in implicit rather than explicit measures.

**Integrity IATs.** Fischer and Bates (2008) developed IAT measures of workplace integrity based on explicit, overt integrity scales, according to the BID. They used attributes (e.g., “honest” and “dishonest”) with word stimuli (e.g. lie, cheat, steal and truth, integrity, fair) that were transparent, as were the categories for classification (e.g. “self” and “others”; “employers” and “employees”). These overt-based IAT measures were uncorrelated with established, explicit integrity measures that included both the overt and personality-oriented types of scales. In addition, these measures were more

consistent with the predictions of classic cognitive consistency theory than were the explicit measures. Subsequent studies showed that the implicit measures had incremental predictive validity for overt behavior related to integrity – telling the truth or lying and obeying or breaking rules (Fischer, et al., 2010; Fischer, et al., 2012). However, despite the increase in predictive validity, the overt-based IAT measures left much of the variance in the criterion measures unpredicted.

IAT measures based upon the second, personality-based category of explicit integrity measures may hold potential to improve prediction. As stated above, while both overt and personality-based explicit measures predict CWB's and theft behavior, the two types of tests are not interchangeable (Berry, et al., 2007). The estimated true criterion validity of personality-based measures has a narrower confidence interval than overt-based measures. Since personality-based scales use more subtle items to assess the underlying constructs that have been demonstrated to predict deviant behaviors, IAT measures based upon these kinds of scales may be more resistant to self-esteem and self-knowledge artifacts.

### **Dark Side Personality Traits**

It has been proposed that many of those who cause problems (e.g. CWBs) in organizations fall on the hostile end of Gough's (1960) socialization continuum, but are smart enough to have escaped legal conflicts or incarceration (Hogan & Hogan, 1989). Socially aversive personality syndromes like narcissism, Machiavellianism, and psychopathy, also known as the dark triad of personality, have been shown to exist in

normal, non-clinical individuals (Paulhus & Williams, 2002). Of these, psychopathy has attracted the most interest over the last few decades.

Trait attributes of psychopathy fall into two clusters that are often referred to as primary and secondary psychopathy (Hare, 1991; Karpman, 1948; Levinson, 1992). Primary psychopathy includes an inclination to lie, lack of remorse, callous insensitivity, and selfishly manipulative behavior. Secondary psychopathy includes impulsivity, a lack of long-term goals, an intolerance of frustration and quick-temperedness. A sense of fearlessness is associated with both factors. Although these attributes are not exclusive to psychopathy, in that they are found in other “dark triad” syndromes (narcissism and Machiavellianism), these traits are especially characteristic of psychopathy (Paulhus & Williams, 2002).

It has been argued that psychopathy can be understood from the perspective of the Five-Factor Model of personality (FFM; Widiger & Lynam, 1998). Miller, Lynam, Widiger, and Leukefeld (2001) investigated this FFM perspective on psychopathy, and developed what they termed a “FFM psychopathy prototype” (p. 234). Nationally recognized psychopathy experts were asked to rate the prototypical psychopath on each facet of the 30-facet Revised NEO-Personality Inventory (NEO-PI-R). The psychopathy prototype consists of mean ratings (ranging from 1-5) on each of the 30 NEO-PI-R facets. All facets of Agreeableness were rated as low (mean scores less than 2), which corresponds to behaviors like lying, manipulation, and arrogance. Other low scores included several facets of Conscientiousness, which correspond to psychopathic attributes like impulsivity, irresponsibility, and a lack of long-term goals. The prototypic psychopath scored high (mean scores greater than 4) in certain facets of Neuroticism,

Extraversion, and Openness. Psychopathy's relations to Extraversion and Neuroticism are complex, according to the authors, and require examination according to individual facets. Within Neuroticism, psychopathy is positively correlated to high levels of Angry Hostility and Impulsivity and low levels of Depression and Vulnerability. These facets correspond to "psychopathic glibness, superficial charm, fearlessness, and poor behavioral controls" (p. 271). As for Extraversion, psychopathy is linked to low levels of Warmth and high scores on Assertiveness and Excitement Seeking. These scores correspond, respectively, to psychopathic traits of insensitivity and impulsivity.

**Semantics in IATs.** There are several concerns associated with the choice of stimuli used in IATs (Steffens, Kischbaum, & Glados, 2008). Individual differences in the semantic associations of words are the basis of the IAT. However, Steffens, et al. (2008) state that "IATs typically differ much in the stimuli that are used [...] and it often seems rather arbitrary which stimuli are selected" (p. 218). Instead of choosing stimuli meant to represent superordinate concepts, these researchers suggest the use of stimuli that are synonyms of the concepts themselves. In a series of experiments, they found that using synonyms as stimuli resulted in fewer confounds, less unsystematic variance due to individual differences, and less stimulus-specific variance that was unrelated to the variables being studied.

Another potential semantic confound in IAT stimuli involves the valence of descriptors. Individuals may more strongly associate themselves with words associated with a positive valence (e.g. delicate) than words associated with a negative valence (e.g. weak). Schnabel, Asendorpf, and Greenwald (2008) discussed this implicit self-esteem confound, in research on the semantic components of IAT measures. Self-descriptive



attributes produced stronger associations with self-concept, versus words with a similar valence without a self-descriptive component. This finding underlines the importance of the semantic meaning of the word, not just its valence. Personality descriptors like “Agreeable” may not have a corresponding synonym with a negative valence.

As an alternative to traditional bipolar IATs, Schnabel et al. (2008) suggest using semantic contrasts that are non-bipolar. This involves pairing concepts and stimuli that are balanced with respect to an evaluative dimension, in much the same way that forced-choice measures match items according to their social desirability. For example, one of their balanced IATs paired positive aspects of Conscientiousness (“determined,” “dutiful,” “orderly” and “disciplined”) with positive aspects of Agreeableness (“bighearted,” “amicable,” “warmhearted” and “docile”). Another IAT paired negative aspects of these traits (“absentminded,” “neglectful,” and “chaotic” versus “egoistic,” “greedy,” and “quarrelsome”). Correlations among their measures showed that IATs measured implicit associations among semantically distinct self-constructs independently of self-esteem. The correlations also showed that semantically distinct self-construct descriptors correlated with explicit measures of corresponding constructs.

**IATs for Psychopathic/Nonpsychopathic Attributes** The present research sought to pair psychopathic attributes and non-psychopathic attributes with a self-referent dichotomy (me versus not-me) to create IATs that target one’s implicit self-concept. As mentioned earlier, the IAT procedure uses reaction times on classification tasks to assess the strength of associations between concepts and attributes in one’s social cognitive structure (Greenwald et al., 2002). Exemplars of the concepts and attributes (IAT stimuli) are presented one at a time on a computer screen for classification by pressing an

assigned key on the keyboard. For example, an attribute (mean) might be paired with a conceptual category (me), so that every time an exemplar of the attribute (e.g., ruthless, cruel, hostile, etc.) *or* the conceptual category (me) appears on the screen, the subject is instructed to press the key assigned to the left hand. At the same time, a second attribute (shy) is paired with the other conceptual category (not-me), and the subject is instructed to press the key assigned to the right hand any time an exemplar (e.g., quiet, bashful, meek) or the conceptual category appears on the screen. The quicker the reaction time, the stronger the association between the attribute and concept in the subject's social cognitive structure. Since the IAT score is a function of the difference between the mean reaction times for reverse pairings of concepts and attributes (e.g., me+mean and not-me+shy versus me+shy and not-me+mean), the larger the score, the stronger the association with the psychopathic attribute in a person's implicit self-concept.

This research used the Schnabel et al. (2008) procedure to develop valence-balanced IATs that combined either psychopathic or non-psychopathic attributes that were based on the FFM psychopathy prototype described by Miller et al. (2001). By pairing these attributes with a self-referent dichotomy (me versus not-me), the current IATs target one's implicit self-concept. Two of our IATs paired positive aspects of Extraversion ("forceful," "assertive," etc.) and Openness ("spontaneous," "daring," etc.), which are strongly associated with psychopathy, with positive aspects of Agreeableness ("kind," "warm," etc.) and Conscientiousness ("responsible," "dutiful," etc.), which are weakly associated with psychopathy. The attribute labels for the first positive-valence IATs' concepts were "Confident" and "Nice" and the attribute labels for the second IATs' concepts were "Adventurous" and "Conscientious."

Similarly, two IATs paired negative aspects of Agreeableness (“ruthless,” “selfish,” etc.) and Conscientiousness (“careless,” “unreliable,” etc.), which are strongly associated with psychopathy, with negative aspects of Neuroticism (“afraid,” “worried,” etc.) and Extraversion (“withdrawn,” “quiet,” etc.), which are weakly associated with psychopathy. The category labels for the first negative-valence IATs’ concepts were “Mean” and “Shy” and the category labels for the second IATs’ concepts were “Irresponsible” and “Anxious.” Both the Mean-Shy and Confident-Nice IATs’ conceptual categories involve traits that are related to primary psychopathy (Levinson, 1992). Both the Adventurous-Conscientious and Irresponsible-Anxious IATs’ conceptual categories involve traits that are related to secondary psychopathy (Levinson, 1992). By pairing a psychopathy attribute with a non-psychopathy attribute, larger IAT effects (scores) should reflect stronger implicit associations of the self with the prototypic FFM profile. And, as Schnabel et al. (2001) found, the pattern of relationships among the implicit measures should reflect the pattern of relationships among explicit measures of corresponding constructs.

## **Hypotheses**

In accord with procedures described by Campbell and Fiske (1959), we used multiple methods (i.e. implicit and explicit) to measure multiple traits (i.e. mean, irresponsible, selfish and impulsive tendencies), to examine the construct validity of the IATs.

**Hypothesis 1:** The IAT measures corresponding to primary psychopathy (Confident-Nice and Mean-Shy) will be related to explicit (self-report) measures of primary psychopathy, and this relationship will be stronger than their relationships with

explicit (self-report) measures of secondary psychopathy.

**Hypothesis 2:** The IAT measures corresponding to secondary psychopathy (Adventurous-Conscientious and Irresponsible-Anxious) will be related to explicit (self-report) measures of secondary psychopathy, and this relationship will be stronger than their relationships with explicit (self-report) measures of primary psychopathy.

**Hypothesis 3:** The relationship between the two IAT measures related to primary psychopathy will be stronger than their relationships with the two IAT measures related to secondary psychopathy.

**Hypothesis 4:** The relationship between the two IAT measures related to secondary psychopathy will be stronger than their relationships with the two IAT measures related to primary psychopathy.

**Hypothesis 5:** The strength of the relationships among the IAT measures related to primary and secondary psychopathy will be similar to the strength of the relationship between explicit (self-report) measures of primary and secondary psychopathy.

## METHOD

### Measures

**Implicit measures.** Four separate IATs were developed: two IATs consisted of concepts associated with a positive valence, while two other IATs consisted of concepts associated with a negative valence. Each of the four IATs was composed of two concepts, one of which is strongly associated with psychopathy, and a concept that is weakly associated with psychopathy. For example, one of the positive valence IATs contained stimuli (e.g. bold, spontaneous, daring) strongly related to the impulsiveness of secondary psychopathy under the concept label, “Adventurous.” Each of the stimuli had a positive valence. The second concept of Conscientious, a positive valence trait that is weakly associated with psychopathy, included relevant stimuli (e.g. reliable, dutiful, ethical). The example IAT was labeled “Adventurous-Conscientious.” All four IAT concept labels and word stimuli, are presented in Table 2.

**Development of stimuli.** Based on the FFM description of psychopathy, I began by selecting concepts that were strongly or weakly associated with deviance. I chose four concepts that were based on the FFM facets rated by experts, as strongly associated with psychopathy, as described in the list below.

IAT Concepts Based on Facets Strongly Associated with Psychopathy		
<u>Concept Label</u>	<u>NEO-PI-R Facet(s)</u>	<u>Valence</u>
Adventurous	Actions	Positive
Confident	Assertiveness	Positive
Irresponsible	Order*, Dutiful*	Negative
Mean	Altruism*, Tender-Minded*	Negative

\*Facet selected for its strong, negative relationship to psychopathy

In an effort to create a non-bipolar pair of conceptual categories with a similar valence, four other concepts were selected. Each of these concepts corresponds to a facet of NEO-PI-R that is weakly associated with psychopathy, as described in the list below.

IAT Concepts Based on Facets Not Associated with Psychopathy		
<u>Concept Label</u>	<u>NEO-PI-R Facet(s)</u>	<u>Valence</u>
Conscientious	Order, Dutifulness	Positive
Nice	Altruism, Tender-Minded	Positive
Anxious	Anxiety	Negative
Shy	Warmth, Gregarious	Negative

Altogether, I decided on two Positive Valence IAT concept pairs—“Confident-Nice” (Positive IAT 1) and “Adventurous-Conscientious” (Positive IAT 2)—as well as two Negative Valence IAT concept pairs— “Mean-Shy” (Negative IAT 1) and “Irresponsible-Anxious” (Negative IAT 2). IATs corresponding to primary psychopathy were numbered 1 (e.g. Positive IAT 1), and IATs corresponding to negative psychopathy were numbered 2 (e.g. Negative IAT 2). Table 2 presents the concept labels and word stimuli for all four IATs.

For each concept label, synonyms were generated. Beginning with the Adjective Checklist (Gough & Heilbrun, 1983), multiple members of the research team collaborated to find homogenous clusters of words that were semantically similar in meaning, as well as associated with a similar valence. Initial lists of words for each concept were pared down using an iterative process amongst research team members, rating words on valence and semantic similarity, as well as use of reference sources like dictionaries and thesauri. The team arrived at a final list of conceptual exemplars, which multiple raters independently evaluated according to the valence of each word, using a

Likert-based scale (1=very bad/negative, 5=very good/positive). Mean ratings for each word, as well as composite ratings for each of the eight concepts, were used to determine relevance and gauge inter-rater agreement. Descriptive statistics for valence ratings for each concept are available in Table 3. All ratings aligned fairly well with expected valences, with most standard deviations less than 1 scale unit.

***IAT procedure.*** An IRB approved the research design (approval number #13-0239). All four IATs were administered online using software supported by Millisecond, Inc. Concept labels were shown in the top corners (left/right) of the screen, and stimuli were presented in the center of the screen. Each IAT followed the seven-block procedure recommended by Greenwald, Nosek, and Banaji (2003). At the conclusion of Positive IAT 1, Negative IAT 1 began, followed by Positive IAT 2, and finally Negative IAT 2.

**Explicit Measures.** The Levenson Self-Report Psychopathy Scale (LSRP; Levenson, Kiehl, & Fitzpatrick, 1995) is used to measure levels of psychopathic attributes. Developed and validated for non-institutionalized populations, the LSRP consists of 28 items with Likert-based responses ranging from 1 (strongly disagree) to 4 (strongly agree). The measure provides scores for both primary and secondary psychopathy. Primary psychopathy is composed of the cluster of behaviors including lying, lack of remorse, callousness, and selfishness. The primary psychopathy subscale (LSRP-1) includes 18 items like “For me, what’s right is whatever I can get away with” and “I enjoy manipulating other people’s feelings”. Secondary psychopathy traits include impulsive, thrill-seeking behaviors, and intolerance of frustration. The 10 subscale (LSRP-2) items include “I am often bored” and “I find myself in the same kinds of trouble, time after time.” Reliability estimates for the primary psychopathy subscale are

robust ( $\alpha = .82$ ), while those for the secondary psychopathy subscale are not as strong ( $\alpha = .63$ , Levenson et al., 1995). The LSRP items were administered by computer using inQsit software.

## **Participants**

Participants were recruited from psychology courses at a public university in the Midwest. More were male (53%), and most were white (80%), and young ( $M=20.7$  yrs). Course credit was awarded for participation.

## **Procedure**

A computer lab containing 30 workstations was used to administer both the explicit and implicit measures. Upon arrival, informed consent was obtained from participants and course credit was awarded. Participants were provided with a randomly generated five-digit ID number and directed to the web sites that hosted the explicit and implicit measures. The order of presentation (explicit vs. implicit) was counterbalanced across participants so that approximately half of the subjects began with the implicit measures, while the other half began with the explicit measures. The four IAT s were presented in the same order for each participant.



## RESULTS

### Descriptive Statistics

Descriptive statistics for study variables are presented in Table 4. Results suggest measures provided adequate variance. While internal consistency estimates for the explicit measures are acceptable ( $\alpha \geq 0.70$ ), the internal consistency estimates for the implicit measures vary. Only one of the IATs (Positive IAT 2) approached an acceptable level ( $\alpha = 0.69$ ) of internal consistency. All three of the remaining IATs yielded consistency coefficients that fall below Nunnally's (1978) benchmark for acceptable reliability.

Table 5 contains zero-order correlations for study variables. These coefficients provide some evidence of convergent validity for both the explicit and implicit measures, as framed by the research hypotheses.

### Tests of Hypotheses

Hypothesis one was supported, as both IAT measures related to primary psychopathy were positively correlated with the explicit measure of primary psychopathy (LSRP-1). In particular, the relationship between Negative IAT 1 and the explicit measure was considerably stronger than the relationship between Positive IAT 1 and the explicit measure (see Table 5). The primary psychopathy IATs correlated more strongly with the explicit measure of primary psychopathy ( $r = 0.15$ ;  $r = 0.39$ ) than the explicit measure of secondary psychopathy ( $r = 0.06$ ;  $r = 0.18$ ).

Hypothesis two was partially supported, in that the Negative IAT related to secondary psychopathy was significantly correlated with the corresponding self-report

measure (LSRP-2); but this relationship was weak according to Cohen's (1992) benchmark standards ( $r = 0.18$ ). Positive IAT 2 was not significantly related to the explicit measure of secondary psychopathy ( $r = 0.08$ ). The LSRP-2 was similarly related to both IATs for primary ( $r = 0.06$ ;  $r = 0.18$ ) and secondary ( $r = 0.08$ ;  $r = 0.18$ ) psychopathy

Regarding the relationships among the four IATs, the results show mixed support for hypotheses three and four. Hypothesis three was partially supported, in that the relationship between Negative IAT 1 and Positive IAT 1 was significant, as well as stronger, ( $r = 0.25$ ) than the correlation of either IAT the positive implicit measure of psychopathy. However, Negative IAT 2 yielded a significant, strong correlation with the negative IAT for primary psychopathy. Hypothesis four was not supported. The relationship between the secondary psychopathy IATs ( $r = 0.08$ ) was the weakest correlation coefficient between any of the four IATs.

Hypothesis five was also partially supported. The relationship between Negative IAT 1 and Negative IAT 2 ( $r = 0.34$ ) was as significant and nearly as strong as the correlation between LSRP-1 and LSRP-2 ( $r = 0.38$ ). However, the mean correlation among all four psychopathy IATs (mean  $r = 0.20$ ) was somewhat smaller than the correlation between the self-report measures ( $r = 0.38$ ).

## DISCUSSION

### Construct Validation Evidence

These results provide some support for the construct validity of the trait-based IATs that we developed. The significant correlation between the negative IAT for primary psychopathy (Mean-Shy) and the corresponding self-report measure (LSRP-1) represents evidence of convergent validity (Campbell & Fiske, 1959). This evidence is amplified when the coefficient is corrected for attenuation due to unreliability in both measures (corrected  $r = 0.545$ ), indicating a strong relationship between the two measures according to Cohen's standards (Cohen, 1992). Although the correlation between the negative IAT for secondary psychopathy and the corresponding self-report measure (LSRP-2) was weak according to Cohen's benchmarks, correcting for unreliability in both measures results in a value more indicative of a moderate relationship (corrected  $r = 0.325$ ). The significant correlation between the two IAT measures of primary psychopathy also represents convergent validity evidence. When this value is corrected for unreliability, a value indicative of a moderate relationship is obtained (corrected  $r = 0.433$ ).

The evidence for the discriminant validity of the IAT measures was less convincing. However, the two IATs for primary psychopathy were not significantly correlated with the positive IAT measure of secondary psychopathy, nor was the positive IAT measure of primary psychopathy significantly correlated with the self-report measure of secondary psychopathy.

Finally, the relationship between the two negative IATs is roughly consistent with the magnitude of the relationship between the two self-report measures. This represents further evidence of the IAT measures' construct validity.

### **Limitations and Implications for Future Research**

Unfortunately, only one of the IAT measures met Nunnally's (1978) standard for adequate reliability when using psychological measures for research purposes (i.e., to make decisions about treatment conditions or relationships). Furthermore, all four measures fell short of meeting his reliability standard for using psychological measures to make decisions about individuals (Nunnally, 1978). This result suggests that our IAT measures are too contaminated with measurement error to be of practical use in identifying those at greater risk of character failure in their work roles.

According to Lane, Banaji, Nosek and Greenwald (2007), stimuli that are categorized easily and quickly will add the least to error variance in the IAT effect. Ambiguity about an item's appropriate categorization will slow reaction times and increase the number of classification errors. Slow responding and classification errors can distort the IAT effect, since it is a function of the difference in mean reaction times for alternate pairings of the categories. This will be especially problematic if stimulus ambiguity and classification ease are confounded with the classification categories (i.e., the stimuli are more quickly and easily classified for one category than another). The percentage of classification errors that subjects make during the IATs is an index of the potential for this source of measurement error. The average error rates for our four IATs ranged from 11% to 14%. These compare poorly with the average error rates we have

observed for standard racial attitude IATs (obtained from the Project Implicit web site at Harvard University), which ranged from 4% to 6%. This indicates that the ambiguity and classification ease of our attribute stimuli is a likely problem with these measures.

The reasons for the elevated error rates may include the (1) labels we chose for the IAT attributes (i.e., they may not be equally easy to identify), (2) the semantic homogeneity of the stimuli for each attribute, (3) the semantic similarity of the stimuli with the attribute label, and (4) the distinctiveness of the paired attributes and stimuli. Reliability estimates suggest these are more problematic for the positive IAT related to primary psychopathy (coefficient alpha for Confident-Nice = 0.56) and the negative IAT related to secondary psychopathy (coefficient alpha for Irresponsible-Anxious = 0.44). Future research might focus on these sources of unreliability in an effort to develop measures that are more psychometrically sound.

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Table 1  
Schematic Overview of the Implicit Association Test.

Stage	Left Key Assignment	Right Key Assignment
1 (practice)	FLOWER	INSECT
2 (practice)	GOOD	BAD
3 (practice)	FLOWER + GOOD	INSECT + BAD
4 (test)	FLOWER + GOOD	INSECT + BAD
5 (practice)	BAD	GOOD
6 (practice)	FLOWER + BAD	INSECT + GOOD
7 (test)	FLOWER + BAD	INSECT + GOOD

Table 2  
 Concept Labels and Word Stimuli for All Implicit Association Tests

	Positive IAT 1		Positive IAT 2		Negative IAT 1		Negative IAT 2	
<u>Concept Labels</u>	<u>Confident</u>	<u>Nice</u>	<u>Adventurous</u>	<u>Conscientious</u>	<u>Mean</u>	<u>Shy</u>	<u>Irresponsible</u>	<u>Anxious</u>
	Strong	Kind	Bold	Responsible	Ruthless	Cautious	Impulsive	Afraid
	Determined	Friendly	Spontaneous	Trustworthy	Rude	Withdrawn	Reckless	Worried
Word Stimuli	Forceful	Warm	Daring	Reliable	Selfish	Quiet	Careless	Tense
	Assertive	Caring	Brave	Dutiful	Angry	Bashful	Lazy	Timid
	Calm	Sensitive	Carefree	Ethical	Hostile	Meek	Unreliable	Fearful

Table 3  
Mean Valence Ratings for IATs and Concepts

	Mean	SD
Positive IAT 1	4.32	0.94
Confident	4.04	1.10
Nice	4.60	0.65
Positive IAT 2	4.42	0.70
Adventurous	4.16	0.75
Conscientious	4.68	0.56
Negative IAT 1	2.02	0.98
Mean	1.32	0.56
Shy	2.72	0.79
Negative IAT 2	1.82	0.72
Irresponsible	1.64	0.70
Anxious	2.00	0.71

All Ratings on 1-5 scale: 1=Most negative valence, 5=Most positive Valence

Table 4  
Descriptive Statistics for Study Variables

Variables	N	Min	Max	Mean	SD	Alpha
Age	114	18	44	20.71	3.80	NA
Implicit Measures <sup>a</sup>						
Positive IAT-1 <sup>c</sup>	115	-1.13	0.49	-0.22	0.30	0.56
Negative IAT-1 <sup>d</sup>	115	-0.80	0.77	-0.08	0.32	0.61
Positive IAT-2 <sup>e</sup>	115	-1.03	0.80	-0.18	0.36	0.69
Negative IAT-2 <sup>f</sup>	115	-1.04	0.70	-0.10	0.29	0.44
Explicit Measures <sup>b</sup>						
LSRP-1	115	1.22	2.94	1.96	0.41	0.82
LSRP-2	115	1.00	3.10	2.14	0.47	0.70

<sup>a</sup> All implicit measures are D scores (standardized mean differences measured in milliseconds); larger (positive) values reflect stronger associations with the psychopathy-related attribute.

<sup>c</sup> Confidence-Nice

<sup>d</sup> Mean-Shy

<sup>e</sup> Adventurous-Conscientious

<sup>f</sup> Irresponsible-Anxious

Table 5  
Zero-order Correlations for Study Variables

Variables	1	2	3	4	5
Implicit Measures <sup>a</sup>					
1. Positive IAT-1 <sup>b</sup>	-				
2. Negative IAT-1 <sup>c</sup>	0.25**	-			
3. Positive IAT-2 <sup>d</sup>	0.17	0.17	-		
4. Negative IAT-2 <sup>e</sup>	0.19*	0.34**	0.08	-	
Explicit Measures <sup>a</sup>					
5. LSRP-1	0.15	0.39**	0.17*	0.12	-
6. LSRP-2	0.06	0.18*	0.08	0.18*	0.38*

\* $p < 0.05$ ; \*\* $p < 0.01$  (1-tail)

<sup>a</sup> N=115

<sup>b</sup> Confidence-Nice

<sup>c</sup> Mean-Shy

<sup>d</sup> Adventurous-Conscientious

<sup>e</sup> Irresponsible-Anxious