ABSTRACT

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The purpose of this study is the development and validation of an implicit measure for employee integrity. To assess implicit integrity, this investigation makes use of the Implicit Association Test (IAT) method developed by Greenwald, McGhee, and Schwartz (1998). The IAT procedure utilized in this investigation is an adaptation of one implemented by Fischer and Bates (2008) in their development of an integrity IAT. A secondary integrity IAT, assessing attitudes towards deviance, was included in an effort to improve deviance prediction. To validate the integrity IAT, participants provided information on past deviance in both academic and work situations and completed personality and overt integrity assessments. The collected data were analyzed in relation to IAT effect sizes to provide support for the measures construct, convergent and discriminant validity. Furthermore, this study also investigated the fakability of the integrity IAT as compared to the fakability of an overt measure of employee integrity (the EII). Results indicate that the two IATs possess sufficient validity and are significantly less fakable than the EII. Despite exhibiting sufficient validity, the second IAT did not behave as expected, indicating that it may be measuring a construct related to, but not the same as, integrity. The EII was shown to be significantly more predictive of CWBs and academic dishonesty, though these findings may be artifactual in nature. Further research is required to investigate how the IATs will behave in an applied setting.
The Investigation of an Integrity-Based Implicit Association Test

by
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DEDICATION

I would like to dedicate my thesis to Madonna, Ian, Sean, and Alexandra for their boundless support.
BIOGRAPHY

Andrew Peter Clark was born September 10th, 1984. He graduated from Paul VI High School and received a Bachelor of Science degree in Psychology and minor in Biology from Virginia Polytechnic Institute (otherwise known as Virginia Tech). His research interests include leadership development, training, and psychometrics.
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The Investigation of an Integrity-Based Implicit Association Test

The past few decades has seen much interest in the construct of integrity as theft and internal fraud combine to cost organizations an estimated $400 billion dollars annually (Greenberg, 2002; Whitney, Diaz, Mineghino & Powers, 1999; Wimbush & Dalton, 1997). Integrity research now spans multiple fields and disciplines (Sackett & Wanek, 1996). Integrity is a complex trait, and there is little consensus as to what constitutes its facets. While most researchers agree the Big Five personality traits (Openness to Experience, Conscientiousness, Extraversion, Agreeableness, and Neuroticism; Costa & McCrae, 1985) underlie the construct, there is a lack of agreement as to what other factors may constitute integrity (Bechtoldt, Welk, Hartig & Zapf, 2007; Berry, Sackett, & Wiemann, 2007). Despite its unclear definition, integrity testing has produced a number of measures that are significantly predictive of integrity related outcomes such as counterproductive (e.g., stealing, sabotage etc.), extra-role, and performance behavior (Berry et al., 2007) ($r = .29$ to $.39$, corrected for unreliability).

Integrity assessments are generally identified as being either overt or covert. Overt integrity tests, like the Employee Integrity Index (EII; Ryan & Sackett, 1987), involve the direct questioning of applicants about admissions of past deviance and attitudes towards deviant acts (Byle & Holtgraves, 2008). Historically such behaviors have a low base rate of admission or detection (Wimbush & Dalton, 1997). Considering the sensitive nature of such testing, there is concern that applicant faking may be responsible for these low base rates (Tett & Christiansen, 2007). Personality-based (covert) integrity tests circumvent this issue by assessing personality constructs thought to underlie integrity (Berry et al., 2007). While
covert tests are less sensitive to faking, they can still be faked (Tett & Christiansen, 2007). One potential solution to concerns over faking is to use an implicit measure of integrity. One such approach is via the implicit association test (IAT), which utilizes a method of response-time measurement. The purpose of the present study is to investigate the predictive, convergent, and discriminant validity, as well as the fakability, of two integrity based IATs (IAT-sp and IAT-dev).

Implicit Association Test

The Implicit Association Test (IAT) method developed by Greenwald, McGhee, and Schwartz (1998) is a computer-based assessment that utilizes response latency, or reaction time, to estimate the strength of association between stimuli categories and attributes. Greenwald and colleagues contend that the IAT can be used to uncover automatic associations of which individuals may or may not be cognizant (Greenwald & Farnham, 2000). The development of the IAT provided an advance in the measurement of latent constructs, allowing for more objectivity than other forms of implicit measurement such as the Thematic Apperception Test, which rely heavily on subjective interpretation (Greenwald & Banaji, 1995). The IAT has grown in popularity over the past decade, with a cursory search of the literature revealing the IAT as having been utilized in over 650 published articles since 2001.

In its application, the IAT requires that participants pair target or attribute stimuli to target or attribute categories through the use of response keys (commonly "e" and "i" keyboard keys). A common IAT procedure utilized in past studies consists of seven sequenced blocks of category and response key pairings (Greenwald et al., 1998). Of these
seven blocks, two are repeated blocks (i.e. two sets of identical practice and test blocks). In an investigation of IAT scoring, Greenwald, Nosek, and Banaji (2003) identified an improved scoring algorithm by comparing multiple alternatives. These alternatives included latency measure transformations, revised exclusion criteria, and the inclusion of the traditionally discarded practice blocks (Greenwald et al., 2003). The final calculation for the $D$ algorithm is then to take the difference between category-attribute pairing blocks and divide this difference by pooled standard deviation derived from both blocks (Greenwald et al., 2003). While there are a number of alternatives to this method (e.g., increase lower bound exclusion criteria to >400 ms) this scoring method has proven the most effective (Nosek et al., 2005). This investigation makes use of an alternative procedure consisting of five blocks, wherein practice and test blocks are combined (Meade, 2009).

**Psychometric Properties of the IAT**

Investigations have shown the IAT to possess satisfactory internal consistency estimates, significantly higher than other implicit measures (between .7 and .9; Schnabel et al., 2008). Because the IAT is a reaction time based measure computed from performance speeds on classification tasks, it appears to be resistant to self-presentation artifacts and independent of a person’s introspective ability or self-knowledge, unlike some overt measures (Greenwald, Banaji, Rudman, Farnham, Nosek & Mellot, 2002).

While useful in many respects, the IAT is not without its limitations. The IAT has also been shown to possess inadequate levels of test-retest reliability in some conditions (Schnabel et al., 2008). Interpreting the discrepancy between internal consistency and test-retest reliability (internal consistency $r = .7$, test-retest $r = .52$; Greenwald & Farnham, 2000;
Schnabel et al., 2008), indicates that the IAT captures situation specific or contextual variance as well as stable or lasting variance (Schnabel et al., 2008). Furthermore, multiple retests reveal relatively similar reliabilities across differing periods of time ($r = .47$ for retest 1 and $r = .58$ for retest 2; Egloff, Scherdtfeger & Schmukle, 2005). While context specific variance causes results to differ, stable variance limits the extent to which they do.

Considering the IATs strengths and weaknesses, and the usefulness of overt measures in predicting target behavior and performance (Berry et al., 2007), it is not the purpose of the current investigation to develop a replacement for overt measurement. Rather, the IAT and overt measures appear to assess different processes. Specifically, implicit measures assess automatic processes while overt measures assess controlled processes (Schnabel et al., 2008). Accordingly, it has been proposed that implicit (e.g., IAT) and overt measures (e.g., Employee Integrity Index) may each provide unique information to better predict behavior than either could separately (Berry et al., 2007). Therefore one goal of this investigation is to identify whether this is the case with implicit and overt measures of integrity. The specific IATs utilized will assess the extent to which one associates oneself with deviance (IAT self-perception, IAT-sp) and attitudes towards deviance (IAT attitudes towards deviance, IAT-dev; i.e. the extent to which they believe deviant acts are bad).

**Integrity and Integrity Measurement**

Integrity is a concept that has been investigated across many fields and disciplines (e.g., social, clinical, and educational psychology), each with its own unique interpretation of the construct (Sackett & Wanek, 1996). As such, integrity is a difficult concept to define. Integrity has alternatively been discussed in terms of honesty, trustworthiness, dependability,
conscientiousness, or reliability (Wanek, Sackett, & Ones, 2003). Others define integrity in terms of character and morality (Emler & Cook, 2001). Generally speaking, integrity is a personality trait that involves the embracing of truth, justice, and fairness and is often associated with the avoidance of deviant behaviors and compliance with social norms (Connelly, Lilienfeld, & Schmeelk, 2006).

A majority of the empirical literature has focused on integrity measurement (Berry et al., 2007; Byle & Holtgraves, 2008; Ones, Viswesveran & Schmidt, 1993; Wanek, 1999). Integrity tests were originally developed in an effort to replace the polygraph, made illegal for use by private organizations by the Employee Polygraph Protection Act in 1988 (Whitney, Diaz, Mineghino & Powers, 1999). Since its conception, integrity testing has become one of the most widely applied tools in pre-employment screening and selection practices (Byle & Holtgraves, 2008). While the original intent of integrity testing was to identify persons likely to commit workplace theft, integrity tests are commonly used to predict on-the-job and training performance (Lucas & Friedrich, 2005; Ones et al., 1993; Schmidt & Hunter, 1998), and counterproductive work behaviors (Wanek, 1999).

As discussed previously, integrity tests are classified as being either overt or covert (Byle & Holtgraves, 2008). While it has been noted that individuals scoring high on both integrity test formats have similar profiles (e.g., counterproductive tendencies), meta-analyses have revealed only weak relationships between all forms of integrity tests (Hogan & Brinkmeyer, 1997; Ones et al., 1993). This indicates that such tests, most especially those that are more overt, are not interchangeable as there is an average correlation among overt tests of \( r = .32 \) (Berry, Sackett & Wiemann, 2007; Ones et al., 1993). Alternatively,
personality based measures of integrity are only slightly more related than their overt counterparts \((r = .42; \text{Ones et al., 1993})\). Furthermore, personality-based and overt measures of integrity share even weaker correlations with one another \((r = .25; \text{Berry et al., 2007; Ones et al., 1993})\). These results may be interpreted as evidence that both overt and personality-based attempts to capture the integrity construct are clouded by error, construct contamination, or differing aspects of the integrity construct domain.

One possible contaminant in integrity tests is cognitive ability (Berry et al., 2007). While Ones, Viswesveran, and Schmidt (1996) found no relationship between integrity and cognitive ability, Brown and Cothern (2002) found that faking success on integrity assessment was significantly related to cognitive ability. The two views can be reconciled, as it is still unclear whether or not applicants fake integrity during selection assessment (Berry et al., 2007). While overt measures of integrity prove useful in predicting performance, faking is still a concern (Dwight & Alliger, 1997). It is possible that when faking is an issue, response latency measures can be utilized to limit the extent to which applicants are able to fake (Berry et al., 2007; Dwight & Alliger, 1997). While personality-based integrity tests have been shown to be more resistant to faking than overt integrity tests, they have not been proven infallible (Alliger & Dwight, 2000; Fiedler & Bluemke, 2005; Tett & Christiansen, 2007). IAT effects have been shown as the least influenced by faking when compared to these other forms of measurement (Kim, 2003).

This is not to say that the IAT is infallible. The IAT’s resistance to faking is strongest when participants have little or no experience with the IAT, indicating that experience plays a part in determining an IAT score (Steffens, 2004). It is possible to
suppress attitudes on the IAT with and without instruction in how to do so, bringing into question the measure’s fakability (Fiedler & Bluemke, 2005). Research conducted by Fiedler and Bluemke (2005) found that participants were capable of faking by purposefully hesitating on compatible trials making it impossible for investigators to differentiate the fake from true data. This evidence was further supported by the findings of De Houwer, Beckers, and Moors (2007) who discovered that IAT effects can be created from novel stimuli (e.g., made-up racial groups) given instruction to do so. Conversely, research has also shown that individuals generally have great difficulty in faking the IAT without instruction to do so (Kim, 2003). While fakable, response latency measures are still very resistant to faking when compared with other forms of measurement (Kim, 2003; Schnabel, Asendorpf & Greenwald, 2008).

**Hypothesis 1a.** The difference between IAT-sp scores in faking and non-faking conditions will be significantly lower than the difference between scores in EII faking and non-faking conditions.

**Hypothesis 1b.** The difference between IAT-dev scores in faking and non-faking conditions will be significantly lower than the difference between scores in EII faking and non-faking conditions.

**Self-Perceived Integrity IAT**

Early IAT investigations involved the assessment of attitudes and stereotypes, particularly the prediction of racial prejudice (Greenwald et al., 1998). The IAT is now utilized in the assessment of not only race-trait association but also self-perception and implicit personality (Schnabel et al., 2008). For example, Fischer and Bates (2008) presented
evidence suggesting that it is possible to use the IAT to assess integrity attributes. The Fischer and Bates (2008) IATi measure utilized Greenwald, Banaji, Rudman, Farnham, Nosek, & Mellot’s (2002) balanced identity design (BID), consisting of three related IAT categories assessing personal (self/other), social (employee/employer) and attribute (honesty/dishonesty) contrasts. This design allows for investigators to identify self-concept (self-attribute association), stereotype (group-attribute) and identity (group-self Association) (Greenwald, 2002). Following the unified theory of implicit social cognition (Greenwald et al., 2002), the assessment of only two blocks is sufficient for prediction of association strength for all three (Greenwald, 2002). These associations are interdependent; an individual’s perceptions of group-integrity will be based on self-concept and group-membership or identity (Fischer & Bates, 2008). The strength of group-self and self-attribute associations can be used to predict group-attribute association (Greenwald, 2002). Unlike the Fischer and Bates (2008) study, the current investigation does not address group attributions or stereotypes and the two IATs are altered accordingly.

The version of the IAT utilized in this study incorporates a number of revisions on the previous design (see Table 1). First, the social category (employee/employer) was discarded to focus on the IAT-sp’s assessment of self-concept. Second the self/other category and related stimuli were reworded from self/other to self/not-self. This change was made in response to criticism that use of a non-specific other variable may be confounding (Olson & Fazio, 2004; Pinter & Greenwald, 2005). It is possible that a respondent might make comparisons between self and a specific individual or project one’s own personality onto others, thus altering associations (e.g., comparing oneself to an especially honest or dishonest
individual; Karpinski, 2004). In rewording the self/other category a number of stimuli were removed, reduced to only me and not me. The use of only two stimuli is not unprecedented and such IATs have been shown to be psychometrically sound, though they may produce mildly attenuated IAT effects (e.g., $D$ decreases from .97 to .85; Nosek et al., 2005). A second alteration to the Fischer and Bates (2008) design is the inclusion of a second IAT procedure, assessing attitudes towards deviance (IAT-dev). Additionally, this version makes use of a five block design combining matched test and practice blocks (e.g., practice block 3 and test block 4) of the Greenwald et al.’s (2003) seven block design (Meade, 2009).

As discussed previously, common overt measures for integrity, like the EII, consist of two parts; the first involving the assessment of attitudes towards deviant acts while the second requires admission of prior deviance (Ryan & Sackett, 1987). Thus far, discussion has focused primarily on self-attributions of integrity. It is unlikely that one will view oneself as deviant, without ever having committed deviant acts (Knowlton & Hamerlynck, 1967). Following this assumption, the IAT-sp relates most strongly to admissions of past deviance. In this respect, the original Fischer and Bates (2008) integrity IAT does not assess implicit attitudes towards deviance. In an effort to better capture attitudes, this study makes use of good/bad categories utilized by past research in the assessment of attitudes toward a target concept.

The second IAT procedure (IAT-dev; presented in Table 2) adopted the good/bad category used by Cunningham, Preacher, and Banaji (2001) in their investigation of attitudes towards race. The honesty/dishonesty categories utilized in the IAT-sp were converted from attributes (adjectives/verbs) to concepts (nouns) for use in the IAT-dev. The use of these
stimuli categories can be used to identify individuals lenient towards deviance. The inclusion of the IAT-dev should complement the IAT-sp much in the same way overt measures of integrity pair admissions of past deviance with attitudes towards deviance.

**Hypothesis 2a.** The IAT-sp will significantly correlate with the EII.

**Hypothesis 2b.** The IAT-dev will significantly correlate with the EII.

**Hypothesis 3a.** The self-perception IAT (IAT-sp) will correlate higher with the EII admissions of past deviance than with EII attitudes towards deviance.

**Hypothesis 3b.** The attitudes IAT (IAT-dev) will have a higher correlation with the EII attitudes towards deviance than with EII admissions of past deviance.

**Deviance**

In the domain of applied research, researchers often investigate integrity in relation to its prediction of employee performance. Motowidlo (2003) defines performance in terms of the expected value that work behaviors will have for the organization. The performance construct is furthermore multidimensional and its measured behaviors are commonly divided into three categories (task, contextual, and counterproductive performance; Motowidlo, 2003). In integrity research, the most relevant of these behaviors are those that fall under the domain of counterproductive work behaviors (CWBs). CWBs are defined as intentional behaviors that harm an organization, its members, and/or purposefully impede productivity (Gruys & Sackett, 2003). As commonly defined, behaviors are only considered counterproductive if they violate some form of social or group norm (Martinko, Gundlach, & Douglas, 2002). These behaviors can range in severity as well as intended target, individuals or the organization (Spector, Fox, Penney, Bruursema, Goh, & Kessler, 2006). CWBs can
occur as a result of both internal (e.g., personality) and situational factors (e.g., opportunity) (Greenberg, 2002). Many taxonomies aim to categorize various behaviors within the domain of counterproductivity. These often vary in their breadth of scope, with some identifying specific CWB facets or components (e.g., Spector et al.’s, 2006, component model) and others focusing on broader facets (e.g., Bennett and Robinson’s, 2000, CWB-I/CWB-O model).

CWB models organize specific behaviors into the four deviance facets: theft, abuse, sabotage, and withdrawal (Spector et al., 2006). Other taxonomies incorporate property deviance and production deviance (Gruys & Sackett, 2003). Alternatively, Bennett and Robinson (2000) divided CWBs into two groups, dependent upon the target at which such behavior is directed. This taxonomy differentiates between behaviors directed at individuals (CWB-I) and those directed at the organization (CWB-O) (Bennett & Robinson, 2000). While such taxonomies appear conflicting, a recent unifying theory of deviance suggests that they may actually complement one another (Gruys & Sackett, 2003).

The findings of meta-analytic investigations suggest that the co-occurrence of counterproductive behaviors is evidence of a personality-based general deviance construct (Berry et al., 2007; Gruys & Sackett, 2003). This deviance construct is hierarchical; the higher order general deviance construct can be broken down into target-groups (e.g., Bennett & Robinsons' [2000] CWB-I and CWB-O), which can in turn be separated into particular facets (e.g., Theft, Withdrawal, Sabotage etc.; Sackett & DeVore, 2002). This CWB conceptualization is very similar to the general integrity construct, which has been shown to be nearly equally predictive of all CWB facets and components (Berry et al., 2007).
Though there are many CWB measures and taxonomies, the most commonly referenced and widely accepted of these is the CWB-I and CWB-O taxonomy of counterproductive work behavior developed by Bennett and Robinson (2000). This study utilizes this taxonomy and the measure developed from it, Bennett & Robinson’s Interpersonal and Organizational Deviance Scale, to assess CWBs. These behaviors will be assessed to investigate the criterion-related validity of this study's response latency integrity measure.

**Hypothesis 4a.** Integrity, as measured through the IAT-sp, will be positively correlated with admission of counterproductive work behaviors.

**Hypothesis 4b.** Integrity, as measured through the IAT-dev, will be positively correlated with admission of counterproductive work behaviors.

**Academic Dishonesty**

While most researchers prefer the investigation of deviance in terms of work behavior, the hierarchical model of deviance holds suggests that academic and work deviance should be highly correlated with one another (Berry et al., 2007). In support of this theory, previous studies indicate that academic dishonesty and CWBs are both significantly negatively related to integrity (Hilbert, 1985; Lucas & Friederich, 2005; Whitley, 1998). Lucas and Friederich (2005) identified a significant negative relationship \((r = - .53)\) between scores on an Academic Dishonesty Index (ADI; Lucas & Friederich, 2005) and an overt measure of integrity, the Employee Integrity Index (EII; Ryan & Sackett, 1987). Given the relative lack of information concerning the link between implicit integrity and academic dishonesty, further investigation is required to clarify the relationship. Furthermore,
academic dishonesty may not suffer from such low base-rate effects as CWBs (e.g., skipping work may be less common than skipping class, as potential outcomes of skipping work are likely more severe; Wimbush & Dalton, 1997).

**Hypothesis 4c.** Integrity, as measured through the IAT-sp, will be positively correlated with admissions of past academic deviance.

**Hypothesis 4d.** Integrity, as measured through the IAT-dev, will be positively correlated with admissions of past academic deviance.

**Research Question 1.** Do the two integrity IATs (IAT-sp and IAT-dev) jointly account for more variance in CWBs and academic dishonesty than does the EII?

**Research Question 2.** Do the IATs account for significant unique variance in CWBs and academic dishonesty over and above that accounted for the EII?

**Convergent Validity**

A significant portion of integrity-related literature involves the identification of personality facets related to integrity (Byle & Holtgraves, 2008; Murphy & Lee, 1994; Lee et al., 2008). These studies identified significant correlations between integrity and three of the Big Five personality variables conscientiousness, agreeableness, and neuroticism (Berry et al., 2007). The most significant correlation was found between a personality-based measure of integrity and conscientiousness ($r = .43, p<.001$; Byle & Holtgraves, 2008; Murphy & Lee, 1994; Ones et al., 1993). Conversely, Lee, Ashton, Morrison, Corderoy, and Dunlop (2008) found agreeableness to be the strongest correlate of integrity (agreeableness $r = .37$; conscientiousness $r = .24$). As this study primarily focuses on the development and
evaluation of an IAT to assess integrity, the study's fifth hypothesis will involve the use of integrity-related personality variables to investigate the measure’s convergent validity.

**Hypothesis 5a.** The IAT-sp will be significantly positively correlated with conscientiousness.

**Hypothesis 5b.** The IAT-dev will be significantly positively correlated with conscientiousness.

**Hypothesis 5c.** The IAT-sp will be significantly positively correlated with agreeableness.

**Hypothesis 5d.** The IAT-dev will be significantly positively correlated with agreeableness.

**Hypothesis 5e.** The IAT-sp will be significantly negatively correlated with neuroticism.

**Hypothesis 5f.** The IAT-dev will be significantly negatively correlated with neuroticism.

**Discriminant Validity**

Across studies, both extraversion and openness to experience have been consistently shown to have weak non-significant relationships with integrity (Byle & Holtgraves, 2008; Lee et al., 2005). These two variables will be used in the investigation of the IAT's discriminant validity.

**Hypothesis 6a.** The IAT-sp will not be significantly correlated with extraversion.

**Hypothesis 6b.** The IAT-dev will not be significantly correlated with extraversion.
Hypothesis 6c. The IAT-sp will not be significantly correlated with openness to experience.

Hypothesis 6d. The IAT-dev will not be significantly correlated with openness to experience.

Method

Participants

This study's participants consisted of 251 undergraduate students enrolled in an introductory Psychology course at North Carolina State University. Students were provided course credit for participation. The sample consisted primarily of Caucasian (69%) females (57%). All participants were either currently employed (43%) or had been employed within the past two years.

Measures

Self-perception implicit association test for integrity (IAT-sp). Two computer-administered IAT procedures were utilized to measure integrity. These IAT procedures are adaptations of an integrity IAT (IATi) previously developed by Fischer and Bates (2008). The original incorporated two categories (self/other and honest/dishonest). As described previously, all items using other individuals as reference (e.g., They, Their, Other) were dichotomized and rephrased for self-reference (e.g., Me and Not-Me, Not My, Not Self). The stimuli and categories for the original and revised integrity IAT are presented in Table 1.

Attitudes towards deviance implicit association test for integrity (IAT-dev). This measure is an adaptation of the IAT-sp, replacing the categories Self vs. Other with Good vs. Bad. The honesty/dishonesty stimuli were not altered. Like the previous version, this
measure consists of five blocks. The stimuli and categories for the IAT-dev are presented in Table 2.

**The employee integrity index (EII).** For the purposes of comparison, the employee integrity index (Ryan & Sackett, 1987) was utilized in this study as an overt measure of workplace integrity. This index consists of 63 items measuring integrity and nine items measuring social desirability.

**Interpersonal and organizational deviance scale (IODS).** The interpersonal and organizational deviance scale devised by Bennett and Robinson (2000) was utilized in this study as a measure of deviant behavior. The scale consists of 12 items measuring deviant behaviors that are directly harmful to an organization and seven items assessing deviant behaviors that are directly harmful to individuals in that organization.

**Academic dishonesty inventory (ADI).** The academic dishonesty inventory (Lucas & Friedrich, 2005) was utilized in this study as a second measure of deviant behavior. The measure consists of 26 items assessing deviant behaviors performed in an academic setting. In this inventory, participants were asked to indicate, for each of the 26 items, whether they have engaged in the behavior in the past 2 years. Scores are then derived by tallying the total number of admitted behaviors. The ADI has been shown reliable, with a Cronbach's alpha of approximately .8. This particular measure may be particularly susceptible to faking as the sample is drawn from students enrolled in the university in which this study is conducted.

**Personality variables.** The International Personality Item Pool (IPIP) NEO Personality Inventory (NEO-PI; Goldberg, Johnson, Eber, Hogan, Ashton, Cloninger, & Gough, 2006) was utilized in this study as an overt measure of the Big Five personality
variables conscientiousness, agreeableness, neuroticism, extraversion, and openness to experience. Each scale consists of 20 items with alphas ranging from .89 to .91 (Goldberg et al., 2006).

Procedure

Participants were informed that the study consisted of two parts, two Implicit Association Tests for integrity (IAT-sp and IAT-dev) and a survey consisting of 289 questions. Participants were informed that the study included questions about integrity, counterproductive work behavior, and academic dishonesty and were asked to complete the two IAT procedures and a computer based survey. The survey consisted of the overt integrity, deviance (work and academic), as well as the IPIP NEO-PI scales. The two IATs and survey procedures were randomly ordered. For the two IATs, participants were presented with instructions prior to each testing block. Prior to taking the survey, participants were asked to indicate whether or not they have been employed in the past year. If the participant had not held a job in the past twelve months, the questionnaire they completed did not include the Bennett and Robinson (2000) Work Deviance scale.

Following completion of the first and second sections, participants were directed to retake the two IATs (IAT-sp and IAT-dev) and EII as if they were an actual job applicant. In debriefing, participants were informed that this final section will be used to assess the fakability of implicit and overt integrity measurement.
Results

Faking

Descriptive statistics for all variables investigated in this study are presented in Table 3. Hypothesis 1a stated that the difference in faking and non-faking conditions would be significantly lower for the IAT-sp than the EII. In order to test this, difference scores were computed for the faking and non-faking conditions of the IAT-sp and the faking and non-faking conditions of the EII. As these assessments were on different scales, the difference scores were compared using a Wilcoxon signed-rank test. Results of the Wilcoxon sign-ranks test indicate that the IAT-sp was significantly less fakable than the EII ($z = -7.09, p < .001$). The same procedure was used to test Hypothesis 1b, that the difference in faking and non-faking conditions of the IAT-dev were significantly lower than the faking and non-faking conditions of the EII. The results of a Wilcoxon signed-rank test indicate that the IAT-dev was also significantly less fakable than the EII ($z = -6.54, p < .001$).

In addition, a dependent samples $t$-test was also conducted to compare fakability, indicating significant and strong differences between the faking and non-faking EII conditions ($t[91] = 31.48, p < .001, d = -1.12$) but not the IAT-sp conditions ($t[212] = .273, p = .785, d = -0.02$); wherein EII scores are higher in the faking condition. Interestingly, the IAT-dev was significantly less fakable than the EII, but a small significant difference was found between its faking and non-faking conditions ($t[199] = 2.08, p = .039, d = 0.20$), indicating that it is possible to fake the IAT-dev. Regardless, all findings support the hypothesis that the two IATs are significantly less fakable than the EII in an uncoached sample.
Correlation’s Among Integrity Measures

Hypothesis 2a and 2b stated that the two IATs (IAT-sp and IAT-dev) would significantly correlate with the Employee Integrity Index (EII). The correlation coefficients produced by these relationships were significant (IAT-sp, $r[208] = .198, p < .01$; IAT-dev, $r[205] = .139, p < .05$). These correlation coefficients indicate that both the IAT-sp and IAT-dev are significantly related to the EII, thus providing support for Hypotheses 2a and 2b and convergent validity.

Hypothesis 3a states that the IAT-sp will correlate higher with the EII admissions of past deviance than with EII attitudes towards deviance. In order to test this, a Fisher’s $r$ to $z$ transformation was conducted. The difference between the two correlation coefficients produced by the relationships between the IAT-sp and EII admissions of past deviance ($r[218] = .185, p < .01$) and the IAT-sp and EII attitudes towards deviance ($r[212] = .139, p < .05$) was not significant ($z = -.69, p > .05$). Thus, the IAT-sp does not differentially relate to the EII admissions of past deviance and the EII attitudes towards deviance. These results do not support Hypothesis 3a. Conversely, the difference between the two correlation coefficients produced by the relationships between the IAT-dev and EII admissions of past deviance ($r[214] = -.079, p > .05$) and the IAT-dev and EII attitudes towards deviance ($r[209] = .155, p < .05$) was significant ($z = -2.4, p < .05$), providing support for Hypothesis 3b.

Criterion-Related Validity

Hypothesis 4 states that integrity, as measured through the IATs, should be positively correlated with admission of counterproductive work behaviors (CWBs) and academic
dishonesty. To test criterion-related validity, correlations were computed comparing the IAT-sp and IAT-dev to CWBs and academic dishonesty (see Table 4). The IAT-sp was significantly related to CWBs as assessed by the IODS and academic dishonesty, as measured by the ADI. These results support both Hypotheses 4a and 4c (that the IAT-sp will significantly correlate with CWBs and academic dishonesty), indicating that the IAT-sp exhibits criterion-related validity. The IAT-dev was found to be significantly related to CWBs but not academic dishonesty. Hypothesis 4b (that the IAT-dev will significantly correlate with CWBs), but not 4d (that the IAT-dev will significantly correlate with academic dishonesty), is supported by these data. These results provide only partial support for the IAT-dev exhibiting criterion-related validity.

Research Questions

**Research question 1.** This study’s first research question presents an inquiry into whether or not the IAT-sp and IAT-dev jointly account for more variance in CWBs and academic dishonesty than the EII alone. Two regression analyses were conducted with both the IAT-sp and IAT-dev as predictors of CWBs and also academic dishonesty. Additionally, two correlations were computed between the EII and deviant behavior (CWBs and academic dishonesty)\(^1\). These analyses indicated that together, the IATs significantly predicted CWBs \((R[201] = .279, p < .001)\) but not academic dishonesty \((R[190] = .153, p = .108)\) whereas the EII was found to be significantly related to both CWBs \((r[201] = .493, p < .001)\) and academic dishonesty \((r[190] = .418, p < .001)\). In answer to this research question, a Fisher’s \(r\) to \(z\) transformation identified a significant difference between both the CWB \((z = -2.81, p \ldots\)\)

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\(^1\) These analyses were conducted only on data collected from participants who had successfully completed the IAT-sp, IAT-dev, EII, IODS, and ADI with no omitted answers.
< .01) and academic dishonesty ($z = -2.25, p < .05$) correlations, identifying the EII as more predictive than the two IATs. These findings indicated that the IATs produce significantly weaker correlations in relation to deviant behavior than does the EII; though this is not necessarily true in an applied setting. When respondents faked the assessments the EII proved ineffective in predicting CWBs ($r[92] = -.133, p = .21$). The IATs were likewise ineffective (IAT-sp, $r[213] = .072, p = .29$; IAT-dev, $r[200] = .027, p = .71$). A Fisher $r$ to $z$ transformation revealed no significant difference between the faking conditions (EII vs IAT-sp, $z = -1.63, p = .10$; EII vs IAT-dev, $z = -1.26, p = .21$). The EII was, however, significantly predictive of academic dishonesty ($r[88] = -.332, p < .01$) while the IAT-sp ($r[199] = .063, p = .37$) and IAT-dev ($r[189] = .023, p = .75$) were not.

**Research question 2.** This study’s second research question presents an inquiry into whether or not the two integrity IATs, IAT-sp and IAT-dev, account for unique variance in deviant behavior over and above that accounted for by the EII. To answer this research question two hierarchal regressions were conducted wherein EII scores were added in the first block and the IATs were added in the second block, with CWBs and academic dishonesty used as criteria variables.

The first model, EII alone, was significant in predicting CWBs ($r^2 = .243, F[1, 200] = 64.32, p < .001$). The second model, EII and both IATs, contributed additional variance explained over Model 1 ($\Delta R^2 = .080, F[2, 198] = 19.22, p < .001$). While the IATs, when combined, contributed significantly to the prediction of CWBs, they did not do so equally. Both the EII and IAT-dev significantly contributed unique variance explained in CWBs (EII, $\beta = -0.617, p < .001$; IAT-dev, $\beta = 0.635, p < .001$) whereas the IAT-sp was not significant. In
predicting academic dishonesty, the first model, EII alone, significantly predicted academic dishonesty ($r^2 = .175$, $F[1, 189] = 40.12, p < .001$). The second model, EII and both IATs, did not significantly account for additional variance in the model ($\Delta R^2 = .021, F[2, 187] = 2.41, p = .093$). Moreover, only the EII contributed unique variance to Model 2 ($\beta = -0.394, p < .001$) as neither IAT contributed unique variance to model 2 (IAT-sp, $\beta = -0.269, p = .164$; IAT-dev, $\beta = 0.214, p = .084$).

**Personality Correlates**

To test the study’s fifth Hypothesis (H5a through H5f: The two IATs are significantly correlated with conscientiousness, agreeableness, and neuroticism) correlation coefficients were computed between the variables (see Table 4). The IAT-sp was significantly correlated with conscientiousness, but not agreeableness or neuroticism. Alternatively, the IAT-dev significantly correlated with agreeableness but not conscientiousness or neuroticism. These data only support hypotheses 5a (IAT-sp related to conscientiousness) and 5d (IAT-dev related to agreeableness).

**Discriminant Validity**

To test this study’s sixth and seventh hypotheses (H6a, H6b, H6c and H6d: The two integrity IATs, IAT-sp and IAT-dev, exhibit discriminant validity with extraversion and openness to experience), correlation coefficients were computed between each of the two IAT procedures and the two personality variables (see Table 4). The IAT-sp produced no significant coefficient when correlated with extraversion or openness to experience. Likewise, the IAT-dev produced no significant coefficients when correlated with
extraversion or openness to experience. These results provide evidence supporting the Hypothesis that the IATs (IAT-sp and IAT-dev) exhibit discriminant validity.

**Discussion**

This study’s primary purpose was to compare three integrity assessments, the IAT-sp, IAT-dev, and EIIs, in their prediction of CWBs and academic dishonesty. Prior to making such comparisons, as the IAT-sp is a revised version of Fischer and Bates (2008) integrity IAT and the IAT-dev developed for use in this study, it was necessary to validate both assessments. Criterion-related, convergent, and discriminant validity of both IATs were investigated in this study.

**Assessment Validation**

**Integrity assessment.** This study’s results indicate that both IATs were significantly related to the EII. These findings are contrary to those of Fischer and Bates (2008) and Fischer, Osafo, and Turner (2010) who found no significant correlation when comparing their integrity IAT to the EII. It is possible that altering the IAT target categories (self/other to me/not me) improved convergent validity, though, as no data were collected on the original IAT-i, there are no findings to support this supposition. As the purpose of the two IATs (IAT-sp and IAT-dev) was to reflect the two EII subscales (admissions of past deviance and attitudes towards deviance), a further test of construct validity was required; wherein the IAT-sp and IAT-dev were compared to the EII subscales.

When separating the EII into its two components, it was found that the IAT-sp significantly correlated with both admissions of past deviance and attitudes towards deviance though these correlations did not significantly differ. Assuming that both subscales assess
integrity, these findings provide further support for convergent construct validity, though no nuanced discriminant validity was found. As the IAT-sp is capable of measuring both admissions and attitudes, it brings into question the IAT-dev's functionality. The IAT-dev was designed as a supplement to the IAT-sp; the two were meant to be used in conjunction to mimic the EIIs two subscales. As the IAT-sp significantly predicts both subscales, the IAT-dev may not be a necessary supplement.

As expected, the IAT-dev significantly predicted attitudes towards deviance but not admissions of past deviance, as measured by the EII. Unlike the IAT-sp, the IAT-dev exhibits discriminant validity in predicting attitudes over admissions. These findings are noteworthy, as the IAT-dev’s criterion-related validity proves contradictory.

**Criterion-related validity.** In comparison to more overt integrity assessments, the IAT is hypothesized to predict traits underlying impulsive and spontaneous behavior (Fischer & Bates, 2008). This study’s results indicate that both integrity IATs are capable of predicting CWBs. These findings suggest that the IAT is capable of predicting both deliberative and impulsive behavior (Banaji, Bazerman, & Chugh, 2003). Likewise, these findings support those of Fischer, Osafo, and Turner (2010), who found a relationship between an IAT for workplace integrity and cheating behavior. These results were notable, as research suggests the IAT will perform poorly in the prediction of scores on explicit measures (Fazio & Olsen, 2003).

The IAT-sp was found to significantly correlate with both CWBs and academic dishonesty, whereas the IAT-dev only correlated with CWBs. It is interesting to note that while higher scores on the IAT-sp should relate to fewer instances of counterproductive
behavior and academic dishonesty, the IAT-dev was positively correlated with CWBs and not related to academic dishonesty. These results are surprising, as the IAT-dev was found positively correlated with integrity. One would expect higher IAT-dev effects to predict fewer, not more, CWBs. These contradictory findings indicate that the IAT-dev is measuring a construct related to, but not the same as, integrity. Convergent validity analysis lends support to this supposition.

**Convergent and discriminant validity.** Past research has identified the three Big Five personality variables conscientiousness, agreeableness and neuroticism to relate to the integrity construct; with conscientiousness exhibiting the strongest relationship (Berry et al., 2007). Considering these results, one would expect both IATs to significantly correlate with at least conscientiousness, if not agreeableness or neuroticism. In line with expectation, the IAT-sp was found to correlate significantly with conscientiousness, though it did not correlate with agreeableness or neuroticism. Contrary to expectation, the IAT-dev exhibited no significant relationship with conscientiousness, instead correlating only with agreeableness. Though these findings run contrary to expectation, in at least one instance research has shown agreeableness to be the strongest predictor of integrity (Lee et al., 2008).

As both the IAT-sp and IAT-dev correlated with one of the three Big Five variables relating to integrity, both can be said to exhibit partial evidence for convergent validity. Neither IAT was found to correlate with the remaining two Big Five constructs, extraversion or openness to experience, thus it can be said that both IATs exhibit discriminant validity.

While both IATs exhibit discriminant validity and partial evidence for convergent validity, the lack of relationship between the IAT-dev and conscientiousness lends more evidence to
the conclusion that the IAT-dev is measuring a construct different from that assessed by the IAT-sp and EII.

**Implications.** The IAT-sp and IAT-dev have been shown to exhibit discriminant validity, and at least partial criterion-related and convergent validity. The IAT-sp in particular appears to be an adequate measure of integrity. Taken in total, however it does not appear that the IAT-dev is assessing the intended construct. A positive correlation between the IAT-dev and CWBs should not occur if the IAT-dev scores are a manifestation of the integrity construct.

**IAT-EII Comparison**

**Research questions.** Results indicated that the IATs, when combined, significantly correlate with deviant behaviors (CWBs and academic dishonesty) but have a weaker correlation with these behaviors than does the EII. It has been posited that, while the IAT is capable of measuring both deliberate and impulsive acts, the IAT better predicts impulsive behavior (Asendorpf, Banse, & Mucke, 2002). Furthermore, the EII, IODS, and ADI are all explicit measures. Explicit assessments have been shown to have higher correlations with other explicit measures than with implicit measures (Berry et al., 2007); this occurs most especially when assessing a sensitive construct like deviance (Fischer & Bates, 2008). It is possible that the two IATs, when combined, could predict impulsive deviant behavior above and beyond that predicted by the EII though the current study did not examine impulsive behaviors. Alternative methods of collecting CWB data (e.g., putting individuals in situations to perform deviant acts on impulse) could produce different results.
In investigating this study’s second research question, despite their lower correlations with deviant behavior than the EII, the two IATs did account for unique variance in deviant behavior over and above that accounted for by the EII. Though the IATs contributed to the prediction of CWBs, the IAT-sp did not contribute uniquely. Though the IAT-sp was not an effective supplement to the EII in prediction of deviant behavior, the IAT-dev was. The IAT-dev significantly contributed to the prediction of CWBs when paired with the EII. This is not entirely surprising, as results indicate the IAT-dev to be measuring some construct related to, but not the same as, integrity and thus the IAT-dev is not overshadowed by the EII. Though the IAT-dev contributes significantly and uniquely to the prediction of CWBs when paired with the EII, it is unclear as to what construct it is measuring. Future research is needed to validate the IAT-dev.

**Fakability.** Though the EII appears to be a more robust integrity assessment, there is still the issue of fakability. Results indicated that the EII, when faked, no longer significantly predicted CWBs and that the two IATs were likewise no longer predictive. The faked EII was significantly correlated with academic dishonesty, though this is more likely related to the classroom environment in which the study was conducted. When faking the EII, participants would indicate fewer deviant behaviors. It is possible that participants, in a classroom setting, were more likely to fake their responses on the ADI in a similar fashion to faking the EII, causing an illusory correlation to appear. The correlation then is the relationship between two faked measures and not, as it appears, the relationship between the EII and academic dishonesty. As faking is a threat to an assessments predictive ability, the IATs could prove more useful in applied settings than the easily fakable EII.
The transparency of the EII has been shown susceptible to faking (Schhnabel et al., 2008). This effect is exacerbated when the assessment's construct is of a sensitive nature (e.g., CWBs and academic dishonesty) and the respondent perceives a benefit that can be derived by faking (e.g., getting a job, raise, etc.; Fischer & Bates, 2008). It is possible to purposefully hesitate or speed up in responding to trick the IAT (Fiedler & Bluemke, 2005). In the administration of this study, it was noted that participants utilized this strategy unsuccessfully. In attempting to fool the program by this method, approximately 11% of participants’ data were discarded by the program for being too fast. Data were also discarded if a participant tried to trick the program by slowing down (substituting a faster time into the scoring algorithm, see Greenwald et al., 2003). It is possible that, along with being more difficult to fake, attempting to fake the IAT carries more risk of being caught than with explicit measures. In faking explicit measures, a respondent only needs to strongly agree with socially desirable responses and strongly disagree with undesirable responses. In faking the IAT, in the event that a respondent understands the program's latency method, they must concentrate on tactically controlling their response speed.

The results identified the IAT-sp as being significantly less fakable than the EII. While the EII explains more variance in deviant behavior than does the IAT-sp, it is considerably more susceptible to faking. The data likewise indicated that the difference between faking and non-faking conditions in the IAT-dev were significantly lower than those in the EII. While this finding is promising, the result of a dependent samples $t$-test indicated a significant difference between the IAT-dev conditions. It can be concluded that the IAT-dev is fakable, but still less fakable than the EII. While it is unclear as to whether or not a
respondent will purposefully fake responses to integrity tests (Berry et al., 2007), it is clear that the IATs are better equipped to prevent faking attempts.

**Implications.** This study's findings do not provide evidence to suggest that integrity IATs can replace existing explicit assessments like the EII. The relationships between the EII and deviant behaviors were stronger than those produced by the integrity IATs. Furthermore, in testing the additional variance explained by the IATs, only the IAT-dev was found to uniquely contribute to the prediction of deviant behavior. As noted previously, there is evidence to suggest that the IAT-dev may be capturing a construct that is related to, but not the same as, integrity. While the IATs are related to deviant behaviors, there is no evidence to suggest that they are more effective measures than the EII. However, there is likewise no evidence to suggest that the EII is a better predictor of actual deviance, as the IODS and ADI are self-report explicit measures with items very similar to those on the EII. Furthermore, both the EII and IODS require the admissions of past deviance. The IAT-sp is intended as a predictor of future deviance and could prove to be a more effective predictor of observed, rather than self-reported, deviance. One firm conclusion from this study is that the IATs are less fakable than the EII.

The IAT-sp could prove to be a useful tool when faking is a concern. While it has been suggested that faking ability is related to cognitive ability (Brown & Cothern, 2002); there are instances in which choosing ethical employees may be a key concern. As it is less fakable than the EII and possesses sufficient validity, in such instances the IAT may be an appropriate assessment. Further research should be conducted to clarify the relationships
identified in this study and determine the utility of the IAT-sp and IAT-dev as integrity assessments.

Limitations and Future Research

This study's most significant limitations relate to the sample used in this study. Participants were primarily unemployed undergraduate students between the ages of 18 and 21. Though most were unemployed, 43% of participants were currently employed, 40% had held a job within the past year, and 17% had held a job within the past two years. Despite this work history, past research has suggested that students are poor employee surrogates (Singer, 1989). While all participants had been employed, most jobs were likely temporary or part-time. Furthermore, the study itself was conducted in a lab setting without any incentives, whereas in an applied setting job applicants could be denied employment based on their responses. This likely proved detrimental to the study’s external validity. In an effort to generalize these results, it may be necessary to replicate this study within an organization in a mock or real selection scenario. Furthermore, such research could benefit from covert assessment of performance behaviors (e.g., observed deviance).

Another limitation in this study is that the integrity IATs were adaptations of existing assessments. As integrity is a construct without a clear definition, it may be necessary to conduct more research to ensure that the words used as stimuli in this study are the best to represent the integrity construct. This research could also benefit from the inclusion of other relevant constructs that might influence the relationship between the integrity IATs and deviant behaviors (e.g., cognitive ability, impulsivity, social desirability, etc.).
Conclusion

This investigation has produced evidence to support the construct, criterion, convergent, and discriminant validity of the IAT as a method to measure integrity. The utility of these assessments is unclear as the IAT-sp does not uniquely contribute to the prediction of deviance when paired with the EII. Further, while predictive of deviant behavior, the IAT-dev should not be categorized it as an integrity assessment. There are, however, a number of confounding variables which could have influenced these findings, the most significant being the explicit self-report nature of data collection. Further research is necessary to clarify the relationship between the integrity IATs and relevant constructs as well as to improve generalizability of this study's findings.
References


Byle, K. A. & Holtgraves, T. M. (2008). Integrity testing, personality, and design: interpreting the personnel reaction blank. *Journal of Business and Psychology*, 22,


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Table 1

Implicit Association Test of integrity (IAT-sp)

<table>
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<tr>
<th>Person (original)</th>
<th>Person (revised)</th>
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</tr>
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<td>Other</td>
<td>Self</td>
</tr>
<tr>
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<td>Them</td>
<td>Me</td>
</tr>
<tr>
<td>My</td>
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<td>Mine</td>
<td>Theirs</td>
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</tr>
<tr>
<td>Self</td>
<td>Other</td>
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</tr>
<tr>
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Table 2

*Implicit Association Test for attitudes towards deviance (IAT-dev)*

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<th>Integrity Concept (revised)</th>
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</tr>
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<tr>
<td>Dishonest</td>
<td>Good</td>
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<table>
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<td>Maggot</td>
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<td>Theft</td>
<td>Joy</td>
<td>Poison</td>
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<td>Deception</td>
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<td>Devil</td>
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<td>Corruption</td>
<td>Peace</td>
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Table 3

*Descriptive statistics*

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<th>M</th>
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<td>IAT-sp</td>
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<td>.34</td>
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<tr>
<td>IAT-dev</td>
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<td>.66</td>
<td>.29</td>
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<tr>
<td>EII (Total)</td>
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<tr>
<td>EII admissions</td>
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<td>.51</td>
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<tr>
<td>EII attitudes</td>
<td>240</td>
<td>4.44</td>
<td>.64</td>
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<tr>
<td>IODS</td>
<td>251</td>
<td>1.95</td>
<td>.67</td>
</tr>
<tr>
<td>ADI</td>
<td>235</td>
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<td>.51</td>
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<tr>
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<tr>
<td>Openness</td>
<td>251</td>
<td>5.04</td>
<td>.99</td>
</tr>
</tbody>
</table>

*Note.* The EII listed can be broken down into two subscales, attitudes towards deviance and admissions of deviance. The IODS stands for Interpersonal and Organizational Deviance Scale (measuring CWBs). The ADI stands for Academic Dishonesty Inventory. The variable Openness stands for Openness to Experience.
Table 4

*Bivariate correlation matrix*

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<thead>
<tr>
<th>Variable</th>
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<th>3</th>
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<th>8</th>
<th>9</th>
<th>10</th>
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</thead>
<tbody>
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<td>1. IAT-sp</td>
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<td>0.063</td>
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<tr>
<td>2. IAT-dev</td>
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<td></td>
<td>0.198**</td>
<td>0.139*</td>
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<td></td>
<td></td>
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<td></td>
<td></td>
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</tr>
<tr>
<td>3. EII (Total)</td>
<td></td>
<td>0.185**</td>
<td>-0.079</td>
<td>0.618**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>4. EII-admissions</td>
<td></td>
<td>0.139**</td>
<td>0.155*</td>
<td>0.984**</td>
<td>0.492**</td>
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<tr>
<td>5. EII-attitudes</td>
<td></td>
<td>-0.176**</td>
<td>0.175**</td>
<td>-0.496**</td>
<td>-0.449**</td>
<td>-0.452**</td>
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<td>6. IODS</td>
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<td>0.457**</td>
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<td>0.418**</td>
<td>-0.342**</td>
<td>-0.317**</td>
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<td>0.449**</td>
<td>0.312**</td>
<td>0.432**</td>
<td>-0.481**</td>
<td>-0.292**</td>
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<td>9. Agreeableness</td>
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<td>0.064</td>
<td>-0.168*</td>
<td>-0.119</td>
<td>-0.170**</td>
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<td>-0.091</td>
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<td>0.033</td>
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<td>0.009</td>
<td>0.096</td>
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<td>-0.008</td>
<td>0.183**</td>
<td>0.129*</td>
<td>0.185**</td>
<td>-0.006</td>
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<td>12. Openness</td>
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Table 4 Continued

Note. Openness stands for the variable, openness to experience. Sample sizes ranged from 219 to 251. Differences are attributed to missing data in the relevant scale; wherein incomplete data were discarded. Sample sizes for each scale are presented in Table 3.