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Mapping Integrity in the Domain of Trait Personality

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FLORIDA INTERNATIONAL UNIVERSITY

Miami, Florida

MAPPING INTEGRITY IN THE DOMAIN OF TRAIT PERSONALITY

A thesis submitted in partial fulfillment of

the requirements for the degree of

MASTER OF SCIENCE

in

PSYCHOLOGY

by

Andrew J. Laginess

2017

To: Dean Michael R. Heithaus
College of Arts, Sciences and Education

This thesis, written by Andrew J. Laginess, and entitled Mapping Integrity in the Domain of Trait Personality, having been approved in respect to style and intellectual content, is referred to you for judgment.

We have read this thesis and recommend that it be approved.

_____
Valentina Bruk-Lee

_____
Stefany Coxe

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Chockalingam Viswesvaran, Major Professor

Date of Defense: October 19, 2016

The thesis of Andrew J. Laginess is approved.

_____
Dean Michael R. Heithaus
College of Arts, Sciences and Education

_____
Andrés G. Gil
Vice President for Research and Economic Development
And Dean of the University Graduate School

Florida International University, 2017

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ABSTRACT OF THE THESIS

MAPPING INTEGRITY IN THE DOMAIN OF TRAIT PERSONALITY

by

Andrew J. Laginess

Florida International University, 2017

Miami, Florida

Professor Chockalingam Viswesvaran, Major Professor

This thesis was conducted to empirically examine and compare the different conceptualizations of the integrity test construct identified in previous research. The conceptualizations assert that integrity tests measure a major trait (i.e., Conscientiousness or Honesty-Humility), a combination of major traits, or a combination of minor traits (personality facets). The general fit and predictive validity (of counterproductive work behavior, or CWB) of each conceptualization was tested.

Psychology undergraduates ($N = 436$) participated via online surveys containing two personality scales, two integrity tests, and a CWB scale. The results most support the conceptualizations of integrity as either solely the broad trait Conscientiousness or a combination of Conscientiousness, Agreeableness, and Neuroticism. Statistical issues were encountered with the models of several conceptualizations due to the number of predictors used and high multicollinearity between them. A closer examination revealed that integrity tests mostly encompass behaviors typically associated with the traits Conscientiousness and Agreeableness.

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CHAPTER I. INTRODUCTION

Employees who uphold their own personal values, as well as those established by a society in general, are essential to having an effective, high-performing organization. Integrity, or firm adherence to a code of moral values, is an important quality for individuals at all levels of a company. Hiring only individuals with high integrity ensures that the top executives and managers make unselfish, ethical decisions as leaders and lower-echelon employees do not detract from the organization through pilferage, sabotage, or lowered productivity. As such, when organizations are in the process of hiring new employees, the integrity of each selected applicant is of great concern.

As a general term, integrity typically refers to the consistency with which an individual's behavior demonstrates honesty and truthfulness and reflects his or her moral values. However, in an organizational setting, integrity often refers to aspects of personality that denote behaviors related to employee theft, counterproductive work behavior (CWB), and ethical business decisions (Sackett, Burris, & Callahan, 1989). Thus, when an organization uses an integrity test to measure their employee's "integrity," the goal is mainly to predict theft and other CWB. In fact, most (if not all) employment tests used to assess integrity are designed specifically for this purpose (Ones & Viswesvaran, 2001).

While some integrity tests measure the construct directly (e.g., asking about attitudes toward theft or past instances of counterproductive behavior), others attempt to determine an employee's integrity through other personality constructs that are

theoretically related or underlie the psychological processes that lead to the behaviors that constitute high or low integrity (Sackett et al., 1989). Respectively, these two approaches to measuring the integrity construct are commonly referred to as overt and personality-based (or disguised-purpose). However, despite their different developmental backgrounds, both types of tests have been shown to correlate highly (Woolley & Hakstian, 1993) and load strongly onto a common integrity factor (Ones, 1993). Both approaches to measuring integrity essentially measure an individual's consistent behavior patterns—i.e., their personality. This leads to an important question that inspired the current research: where does the construct measured by integrity tests fit within the larger framework of personality?

The question of what personality elements integrity tests measure, most relevant to the construct validity (i.e., the degree to which a test measures what it claims) of integrity tests, represents their greatest shortcoming in the literature on integrity testing (Goldberg, Grenier, Guion, Sechrest, & Wing, 1991; U.S. Congress, Office of Technology Assessment, 1990) and is of both theoretical and practical importance. Determining the construct space of integrity tests and exploring how they relate to other personality traits can guide the development of more comprehensive and accurate measurement of it. Moreover, the resulting improvements in the quality of integrity tests will likely lead to higher criterion-related validities when the tests are used to aid in the selection of ethical leaders or employees who will not undermine an organization through CWB.

In determining where integrity tests fit within the domain of personality, it is essential to decide first which taxonomy of personality will be used as the frame of

reference. Theoretically, personality may be divided into distinct traits or factors in an infinite number of ways. Various personality models (and their corresponding scales) are used in practice and research, from those with only a few factors (e.g., three; Eysenck & Eysenck, 1976) to those with many (e.g., sixteen; Cattell, 1957). One model that is now widely accepted and has seen a substantial amount of attention in research—particularly in research investigating the construct validity of integrity tests—is the Five Factor Model (FFM, or Big Five; Digman, 1990; Goldberg, 1990). As the name suggests, the FFM consists of five factors: Neuroticism (also called Emotional Stability), Extraversion (also called Surgency), Agreeableness, Conscientiousness, and Openness to Experience (also called Intellect). Use of the FFM in examining the relationships between personality traits and various criteria has been supported by a large body of research (Barrick & Mount, 2005).

Early theories on the location of the construct measured in integrity tests within the FFM mainly focused on the potential overlap between Conscientiousness and integrity (e.g., Murphy, 1993). Employees low in Conscientiousness are likely to display a variety of undesirable habits and behavior in the workplace such as procrastination (Dewitt & Schouwenburg, 2002), stealing from an employer, arguing with coworkers, tardiness, and absenteeism (Roberts, Jackson, Fayard, Edmonds, & Meints, 2009). These are exactly the types of behavior screened for by integrity tests.

Some researchers contend that integrity or honesty may be one of several major personality traits not captured well by the FFM. For example, some have suggested integrity may have connections with the "dark triad" of psychopathy, Machiavellianism, and narcissism (Saucier & Goldberg, 1998). Thus, a second conceptualization of the

construct measured by integrity regards it as a distinct but related construct from the Big Five factors of personality. That is, integrity tests measure another factor of personality not explicitly identified within the FFM.

A recent model of personality developed by Lee and Ashton (2004) in fact classifies six, rather than five, dimensions of normal personality. This model, called HEXACO (an acronym stemming from its six major factors), contains five dimensions that are roughly analogous to those in the FFM and, most importantly, includes a sixth factor labelled Honesty-Humility. Because this factor may be strongly related to integrity, the HEXACO model is a particularly interesting alternative to the FFM in the exploration of integrity's niche within personality. Research comparing the FFM and HEXACO model have shown that HEXACO fares slightly better than the FFM in predicting some scales—particularly those seen as most relevant to the Honesty-Humility dimension, such as integrity tests.

Although early research focused on the potential for integrity tests to tap into a single major trait (e.g., Conscientiousness), subsequent research (e.g., Murphy & Lee, 1994a) actually showed that *several* of the Big Five factors had moderate to high correlations with integrity tests. Accordingly, Ones and colleagues (e.g, Ones, Schmidt, & Viswesvaran, 1994a; Ones, Viswesvaran, & Schmidt, 1995) proposed a third hypothesis for the nature of the personality construct measured by integrity tests: they measure a trait at a level *above* the individual traits of the FFM. They hypothesized that the metatrait Stability (also called Factor Alpha; DeYoung, 2006; Digman, 1997), which is essentially a combination of three of the Big Five factors (Agreeableness, Emotional Stability, and Conscientiousness), is the fundamental personality construct measured by

integrity tests. In spite of empirical support found by Ones and colleagues for the metatrait hypothesis, other researchers (e.g., Schneider, Hough, & Dunnette, 1996) noted several shortcomings of Factor Alpha in explaining integrity test scores, and they began to look at a level *below* the Big Five rather than above.

The five broad factors in the FFM may be further broken down into a number of subordinate dimensions, or facets. Although researchers agree that the Big Five factors may be subdivided into facets, the appropriate organization of traits below the five factors varies between different measures of the FFM. For example, the scale used in the current research contains 30 facets (6 per factor); however, evidence has been found that these facets may be grouped into two intermediary facets per factor (DeYoung, Quilty, & Peterson, 2007). Regardless of how many facets exist and how they may be organized, it has been argued that using these facets has the potential to provide incremental prediction over the five broad factors for a variety of criteria (Paunonen & Ashton, 2001).

Research using the facet level of the FFM revealed that relationships between integrity tests and personality facets varied greatly within each factor (Costa & McCrae, 1995). Thus, a another hypothesis was put forth that, rather than being a simple combination of broad factors (i.e., a metatrait), integrity is a combination of select facets from different factors (Marcus, Höft, & Riediger, 2006). While little research has investigated this position, it has received some empirical support (Marcus et al., 2006).

It is important to note that in their original formulations, these last two models (metatrait and select facets) represent two fundamentally different conceptualizations of the makeup of the personality construct measured by integrity tests. The original metatrait hypothesis formed by Ones et al. (1994a, 1995) argues that integrity tests tap

into a single reflective latent construct (Bollen & Lennox, 1991; Law, Wong, & Mobley, 1998) that accounts for the relationships between Conscientiousness, Agreeableness, and Emotional Stability. On the other hand, the original select facets hypothesis put forth by Marcus et al. (2006) posits that integrity tests (specifically, those that are personality-based) are formed as a compound of several facets; that is, integrity tests represent essentially a test battery of theoretically relatively unrelated facets that are combined. Thus, the several facets conceptualization describes integrity as a formative construct (Bollen & Lennox, 1991).

The original metatrait and select facets hypotheses represent theoretical conceptualizations of integrity that imply differences in both the direction of causality and the nature of the relationships between the involved personality traits. In terms of causality for these models, a reflective model describes observed personality traits as the effect a general integrity factor, whereas a formative model describes observed personality traits as the cause of a latent integrity factor. Concordantly, a reflective model assumes strong relationships between the constituent personality traits (since they would all tap into the same construct), whereas a formative model assumes no such relationships between the personality traits.

It is important to note that the metatrait and select facets hypotheses were initially formed as a results of observed correlations between personality factors/facets and integrity tests. Because these observed correlations do not assume any direction of causality or relationship between personality traits, it is possible that the factors or facets involved in these hypotheses could be used to create both formative and reflective

models. Thus, the metatrait and select facets hypotheses can be bifurcated, with both producing their own reflective and formative models.

Four of the aforementioned conceptualizations of the integrity test construct within a personality framework are summarized by Viswesvaran and Ones (2016). Adding the models described in the preceding paragraph gives a total of six:

(1) integrity tests tap into a major personality trait identified in the FFM (i.e., Conscientiousness);

(2) integrity tests tap into a major personality trait identified in an alternate personality taxonomy (i.e., Honesty-Humility of the HEXACO model);

(3) integrity tests tap into a reflective factor (i.e., Alpha or Stability) on which the personality factors Conscientiousness, Agreeableness, and Neuroticism also load;

(4) integrity tests tap into a factor that is formed as a composite of the personality factors Conscientiousness, Agreeableness, and Neuroticism;

(5) integrity tests tap into a factor that is formed as a composite of select personality facets; and

(6) integrity tests tap into a reflective factor on which select personality facets also load.

In testing these six different conceptualizations, individuals' responses to integrity tests can be factor-analyzed (models 3, 4, 5, and 6) or correlated (models 1 and 2) with the hypothesized trait or traits. This approach can be referred to as the internal analysis of the structure of the integrity construct. In addition to testing the different integrity models internally, the current research will also examine their validity for predicting external criteria. Although several criteria could be tested, CWB will be the criterion

used in the present study since integrity tests are primarily developed to predict the narrow criterion of theft with the focus sometimes extended to the broader criterion of CWB (which includes theft; e.g., Bennett & Robinson, 2000; Spector et al., 2006).

The purpose of the current research is to investigate the relationships between the Big 5, HEXACO traits (specifically, Honesty-Humility), and commercial integrity tests. Accordingly, the goal of this study is to examine all six proposed models of integrity, four of which have been identified in prior research (Viswesvaran & Ones, 2016) and two of which have been newly hypothesized based on alternate interpretations of the preexisting models. Thus, this study represents an important step toward increasing the construct validity of integrity tests by allowing for the comparison of the theoretical conceptualizations of integrity tests described above. Moreover, the results of this research can be used to aid the future development of integrity scales—specifically those that will measure integrity via underlying traits—by enhancing our understanding of the representation of personality traits in currently used commercial integrity tests. Finally, the current study will also examine the utility of each model in predicting an external criteria (CWB).

CHAPTER II. REVIEW OF LITERATURE

The review of relevant literature will begin with the examination of integrity tests, including their development, historic use, and importance as a predictor of workplace criteria. Next, the review will examine trait personality models—specifically, the development and structure of the FFM and the HEXACO model. The following portion of the literature review will use past research on how integrity tests relates to the two aforementioned personality models to develop a description of six different conceptualizations of integrity in the domain of personality. Finally, the relationship of integrity tests with counterproductive work behavior will be discussed.

Integrity Tests

When selecting new employees, organizations are concerned with evaluating the integrity of the applicants. In the past, some employers would use a polygraph test to screen out those who might steal from the organization or otherwise abuse their employment. Such screening involved directly asking applicants about their past behavior as an employee (e.g., if they had stolen from a previous employer) and relying on the polygraph measures of their physiological responses to determine their truthfulness. Polygraph testing in pre-employment screening was a fairly common business practice about until it was prohibited almost entirely under the Employee Polygraph Protection Act of 1988. However, the need for organizations to predict which of their applicants would display high or low integrity remained essential. As such, psychological scales that purported to measure this trait in applicants were adopted by most organizations not already using this alternative approach.

The psychological measures used to evaluate a prospective employee's integrity are now referred to collectively as integrity tests; physiological tests (e.g., polygraphs) and non-self-report assessments of this construct (e.g., interviews or background checks) are not included in this categorization (U.S. Congress, Office of Technology Assessment, 1990). "Integrity tests" (previously called "honesty tests," among other names; Sackett & Harris, 1984) was actually a label assigned post hoc to a subset of tests that were designed to predict specific criteria (Criterion-Focused Occupational Personality Scales or COPS; Ones & Viswesvaran, 2001). In the case of these tests, criteria such as counterproductivity and theft were being predicted (Sackett & Wanek, 1996).

Integrity tests may be classified into one of two categories: overt or personality-based (Sackett & Wanek, 1996). Overt tests, as the name implies, ask transparently about intentions or attitudes regarding theft or counterproductivity. Similar to polygraph examinations, they often ask directly about an applicant's past dishonest behavior (e.g., "Have you ever stolen office supplies from your employer?"). The Personnel Selection Inventory (London House Press, 1980) and Reid Report (Reid Psychological Systems, 1984) are examples of commonly used overt integrity tests. Several assumptions are made in the development of such tests: applicants with low integrity will (1) actually report more dishonest behavior, (2) attempt to justify their own dishonest behavior, (3) believe others display similar amounts of dishonest behavior to their own, (4) tend to be more impulsive and less considerate, and (5) believe society should punish dishonest behavior less harshly (Minden, 2010).

A cursory examination of these assumptions may reveal that some are counterintuitive (particularly the first assumption that dishonest individuals will in fact

honestly report their past misdeeds) and appear unlikely to be tenable. Although applicant faking is certainly a concern with overt integrity tests, it has rarely been found (Murphy, 1993). One possible reason for the observed lack of faking is that applicants may not believe integrity tests to be important in hiring decisions (Goldberg et al., 1991). Another potential reason for not faking is that applicants tend to believe their dishonest behavior is typical of all individuals; this "false consensus effect" (Ross, Greene, & House, 1977) makes applicants more likely to admit their dishonest behavior since they feel it is normal (Goldberg et al., 1991).

Personality-based tests typically do not ask directly about behavior or attitudes per se; rather, they assess certain personality dimensions believed to underlie dishonest or counterproductive behavior patterns. Examples of personality-based integrity tests include the Personnel Reaction Blank (Gough, 1972) and the Employee Reliability Inventory (Borofsky, 1994). A sample personality-based item might ask an individual if they are "reluctant to get into an argument with someone when holding a differing opinion" (Marcus, 2006). This item might be used to determine if an individual is likely to avoid trouble with others, which is a common component of integrity scales. However, note that this item could fit in just as easily in any assessment of an individual's general personality.

Overt versus personality-based integrity tests.

In spite of the large correlation typically found between overt and personality-based integrity tests (average $r = .52$; Sackett & Wanek, 1996), research on whether the two types of integrity scales actually share the same underlying construct (i.e., a general integrity factor) has been equivocal (cf. Hogan & Brinkmeyer, 1997; Marcus, Hoft, &

Riediger, 2006). As such, it behooves any discussion on integrity tests to mention that relationships with personality variables may differ depending on whether overt or personality-based integrity scales are being used.

As might be expected, personality factors tend to have slightly higher correlations with personality-based integrity tests than they do with overt integrity tests (e.g., an average correlation with Conscientiousness of .34 for overt versus .45 for personality-based tests; Sacket & Wanek, 1996). However, various scales representing both types of integrity tests typically show significant correlations with at least one personality factor in most cases (Sackett & Wanek, 1996). Moreover, the correlation patterns between personality factors and either type of integrity tests do not deviate substantially in terms of magnitude.

Factor structure of integrity.

Several factor and item analyses have been conducted to identify the major themes found in integrity tests. Cunningham and Ash (1988) observed four dimensions of integrity: punitiveness towards others, punitiveness towards self, projection of dishonesty for self, and projection of dishonesty to others. Although only one integrity test was examined in the study, it was among the first to detect that integrity was in fact multifaceted. Cunningham and Ash also noted the factors found in their study did not completely overlap with the factors identified in research using a different integrity test, which indicated that the factors underlying integrity may vary from test to test.

Woolley and Hakstian (1992) also found evidence for four dimensions of integrity (using four integrity tests; three personality-based, one overt), but the dimensions differed from those found by Cunningham and Ash. It was found that the personality-based

integrity tests were mostly drawing from a common factor ("socialized control"), whereas one factor was predominantly derived from content from the overt integrity test ("intolerance of dishonesty"). Accordingly, one subscale of the overt integrity test did not correlate well with personality-based integrity tests (nor did it correlate with other personality variables), though the other subscale did. However, the two factors represented mostly by either type of test (socialized control and intolerance of dishonesty) were correlated substantially themselves. This relationship may suggest that, while the content of personality-based and overt integrity tests may differ, the constructs underlying each are strongly related.

Wanek (1995) found 19 common themes among eight integrity tests (including both overt and personality-based), but noted that several themes were associated mainly with only one integrity test. Rather than suggesting that each integrity test may contain idiosyncratic variance, he attributed this finding to a wide range in sample sizes being used for the integrity tests. Subsequently, Wanek, Sackett, and Ones (2003) found 23 themes among seven integrity tests (including both types of integrity test). Wanek and colleagues grouped these 23 themes into four major components: antisocial behavior, socialization, positive outlook, and orderliness/diligence. Although the correlation patterns between composites of these components and integrity tests varied by the specific test used, all components appeared to be represented to some degree within each integrity test. Similar results were obtained by Hogan and Brinkmeyer (1997), who found four integrity components (derived from one personality-based integrity test and one overt integrity test) that could be explained by an overarching general integrity factor.

Taken together, the factor analyses conducted on various integrity tests indicate that both types of integrity test appear to draw from four common (and related) dimensions (Wanek et al., 2003) and ultimately tap into a single general integrity factor (Hogan & Brinkmeyer, 1997; Ones, 1993; Woolley & Hakstian, 1992). Given the different lines of evidence presented above, which suggest all integrity tests examine the same general construct, convergent validity is expected between scores from different integrity tests used in the current study. Thus:

H1: The correlations between integrity test scores will be significant.

The success of both types of integrity test in predicting numerous work criteria, including job performance and various counterproductive behaviors, is well documented (Ones, Viswesvaran, & Schmidt, 1993, 2003), though not without some contention (c.f., Van Iddekinge, Roth, Raymark, & Odle-Dusseau, 2012). However, concerns arose that integrity tests, as replacements of polygraph tests, had similar flaws to their polygraph predecessor. A foremost concern expressed in the Office of Technology Assessment's (1990) ensuing report on integrity tests was an alarming number of false positives: up to 95% of the individuals who "fail" or are deemed "deceptive" by integrity tests were incorrectly categorized as dishonest. Moreover, the report also warned that integrity tests may potentially lead to adverse impact (evidence against this occurrence has since been found; e.g., Ones & Viswesvaran, 1998) and be an invasion of privacy.

In response to this report, a task force appointed by the American Psychological Association was assembled to investigate the appropriateness of integrity tests. The committee concluded that although integrity tests had proven themselves useful in predicting a variety of employment criteria, research was still needed to investigate the

specifics of the construct or constructs being measured by these types of tests (Goldberg et al., 1991). Integrity is traditionally identified as a pattern of behavior or trait (as opposed to an ability-based construct such as intelligence). Thus, research on the construct or constructs being measured by integrity tests logically involves comparing them with tests of other personality dimensions.

Personality

Personality is an extensively researched area of interest within Industrial and Organizational Psychology. Early efforts to identify a taxonomy of personality were based on the lexical hypothesis, which postulates that every important characteristic that may describe an individual will be created within a given language and that the most important characteristics will be described as a single word. Allport and Odbert (1936) compiled and classified all descriptors in the English dictionary, from which they obtained a list of over 4,500 adjectives describing observable, permanent personality traits.

Attempting to formulate a personality taxonomy that was comprehensive but dimensionally parsimonious, Cattell (1946) factor analyzed this list of adjectives and clustered them into 16 primary personality traits. Concurrently, Eysenck (1967) formulated a three-factor model of personality (originally two factors, with one added later). Both personality taxonomies received attention, and the scales developed for them (which have since been updated) are still in use by some employers and researchers. However, many researchers believed sixteen factors to be too many and three factors too few.

The Five Factor Model.

Tupes and Christal (1961) identified five factors from Cattell's original sixteen, which was also found by Norman (1963). By the mid-1980s, several prominent personality researchers (e.g., Digman & Takemoto-Chock, 1981; Goldberg, 1990) agreed that of the many personality tests that had been developed, those that were most promising measured five factors similar to those identified Norman (1963).

Today, the Five Factor Model (FFM or Big 5; Digman, 1990) is regarded as one of the most robust personality models; its factor structure has been replicated in numerous contexts and cultures (John, 1990). Many scales measuring the FFM (e.g., NEO-PI-R [Costa & McCrea, 1992] or Hogan Personality Inventory [Hogan, 1986]) are commonly used in both research and practice of personnel psychology. The usefulness of the Big Five in predicting various work criteria has been researched exhaustively and is generally supported (Barrick, Mount, & Judge, 2001). As the name suggests, the FFM divides normal personality into five factors: Openness to Experience, Conscientiousness, Extraversion, Agreeableness, and Neuroticism.

Openness to Experience (also called Intellect) encompasses aspects of personality related to creativity, imagination, curiosity, and a preference for variety and novelty. Conscientiousness represents an orientation toward being self-disciplined, organized, and dutiful, as well as a need to achieve and a preference for making and executing plans. Extraversion (also known as Surgency) involves being assertive, sociable, energetic, having a tendency to feel positive emotions, and seeking stimulation. Agreeableness is characterized by a tendency to be cooperative, helpful, trusting, compassionate, and good-tempered. Neuroticism (sometimes oppositely

valenced as Emotional Stability) represents a tendency to feel emotions such as anger, anxiety, and sadness.

Although the five aforementioned factors are clearly the hallmark of the FFM, most researchers agree on the existence of traits on different "levels" from the Big Five (Goldberg, 1993). Above the Big Five, Digman (1997) identified two higher-order factors (i.e., superordinate factors composed of several of the Big Five factors), which he labelled Alpha and Beta. The Alpha factor is comprised of Conscientiousness, Agreeableness, and Neuroticism, and the Beta factor is comprised of Extraversion and Openness to Experience. More recently, Rushton and Irwing (2008, 2009) identified a single general personality factor at the top of the personality hierarchy. Below the Big Five, researchers have also noted the existence of narrower personality traits known as facets. Current research is still examining the organization of personality traits at this level to determine the most empirically supported structure and number of facets. Scales of the FFM that examine personality at the facet level typically use two (e.g., DeYoung et al., 2007) to six (e.g., Costa & McCrea, 1995) facets per personality factor. Recognizing and utilizing a hierarchy of personality traits allows researchers more flexibility in matching the bandwidth of personality traits to the criteria being examined, which may improve validity estimates (Paunonen & Ashton, 2001).

The HEXACO Model.

Although the FFM is currently the most widely used personality framework, several other models have been proposed with varying degrees of theoretical and empirical justification. Of the different personality taxonomy alternatives, a six-factor model (that was derived lexically, in the same manner as the FFM) called the HEXACO

(Ashton et al., 2004) has been developed recently and garnered some attention and favor among researchers. The FFM and HEXACO share mostly similar Conscientiousness, Extraversion, and Openness to Experience factors but have slight differences in corresponding Agreeableness and Emotional Stability/Emotionality factors. Additionally, the HEXACO model incorporates the sixth factor, Honesty-Humility, which is characterized by a tendency to be sincere, faithful, modest, and truthful.

Several researchers have posited that the Honesty-Humility factor primarily captures elements of personality outside the FFM (Ashton, Lee, & Son, 2000; Bresin & Gordon, 2011). However, McCrae and Costa (2008a) proposed that most, if not all, of the other personality factors identified in research are either subordinate to a FFM factor or blends of two or more factors. In particular, they suggest that Honesty-Humility is likely to be mainly a subordinate of Agreeableness, as it is conceptually similar to the Straightforwardness and Modesty facets of that Big Five factor. A number of the facets identified within the FFM may be seen as blends of multiple factors (e.g., the Warmth facet of Agreeableness is in fact related equally to the Extraversion and Agreeableness factors; Witt & Shoss, 2012). Thus, adopting the perspective of Honesty-Humility as akin to a blended facet is particularly appealing, as it appears to contain aspects of Agreeableness, Conscientiousness, and Emotional Stability.

Although most researchers agree the FFM adequately covers the entire scope of "normal" or "working" personality, some researchers have noted that the FFM may *not* cover the whole spectrum of personality traits (e.g., Paunonen & Jackson, 2000). As such, some researchers believe Honesty-Humility captures some aspects of personality

not represented (or perhaps not *well* represented) within the FFM. In particular, there is a potential link between Honesty-Humility and the "dark triad" of narcissism, Machiavellianism, and psychopathy (Ashton et al., 2000). This could explain why HEXACO scales have outperformed the FFM in predicting certain negative criteria (Ashton & Lee, 2008), such as manipulativeness (recall that manipulativeness is often included as an aspect of low integrity). If the HEXACO model does in fact measure elements of personality the FFM does not, it could explain some of the differences between these models in predicting certain criteria.

Mapping Integrity Tests in the Personality Domain

The focus of the following sections is to describe six different conceptualizations of integrity by examining the empirical research on the relationships between integrity tests and personality traits. Most of the research on this relationship arose from the call to establish construct validity evidence for integrity tests (see Goldberg et al., 1991; U.S. Congress, Office of Technology Assessment, 1990) after research had already supported the criterion-related validity of such tests (e.g., Bernardin & Cooke, 1993; Ones et al., 1993; Sackett & Harris, 1984).

Although the FFM is not the only personality taxonomy used by scientists or practitioners (nor is it without its criticisms), it is the most widely researched and accepted classification of normal personality. Furthermore, most of the research examining the construct validity of integrity tests invokes the FFM. Thus, research on the relationship between integrity tests and personality dimensions in other personality frameworks (e.g., the Myers-Briggs Typology Indicator or Eysenck Personality Questionnaire) and those beyond the Big Five (see Hong, Koh, & Paunonen, 2012;

O'Neill & Hastings, 2011) will *not* be covered in this chapter or utilized in the current study, with the exception of the HEXACO model due to its similarity and relevance to this particular topic.

(1) Integrity as the Big Five factor Conscientiousness.

Conscientiousness was initially regarded as the most likely of the Big Five factors to be the main dimension underlying integrity tests (Murphy, 1993). Even though integrity tests (as COPS) are typically created without any particular regard to personality constructs (Sackett & Wanek, 1996), it was initially believed that integrity was mostly aligned with Conscientiousness. Based on the overlap of characteristics described by integrity tests and Conscientiousness (e.g., "dependable" or "responsible"), the two constructs do appear to be, at least theoretically, closely related. The Employee Reliability Inventory (Borofsky, 1994), Wonderlic Productivity Index, and the integrity scale within the Hogan Personality Inventory (Hogan & Hogan, 1989) even contain Conscientiousness as a main factor, as does one of the integrity tests used in the current study. Several other personality-based integrity tests contain subscales similar to the constructs identified as facets in Conscientiousness (e.g., "positive self-concept").

Consistent with the apparent theoretical relationship between integrity and Conscientiousness, many researchers have found a moderate to strong empirical relationship between the two. Researchers typically find corrected correlation between Conscientiousness and integrity tests ranging from .36 to .50 (Hogan & Brinkmeyer, 1997; Murphy & Lee, 1994b). Ones et al. (1994b) provided a meta-analytic estimate of .45 for the relationship between these constructs after correcting for unreliability in the

measures. Thus, the first proposed conceptualization of integrity equates it with the Big Five factor Conscientiousness.

H2. Conscientiousness will be significantly correlated to all integrity tests.

(2) Integrity as a sixth personality factor.

The HEXACO model of personality (Ashton et al., 2004) can be thought of as a variation of the FFM, containing five factors loosely analogous to the Big Five and one additional factor. In essence, the sixth factor, Honesty-Humility, appears to be at least partially pieced together from parts of the original Big Five—mostly Agreeableness and Neuroticism, which are slightly altered compared to their Big Five counterparts.

The HEXACO model has been used to predict criteria such as narcissism (Bresin & Gordon, 2011), cyberbullying (Smith, 2016), and task and contextual performance (Pedooem, 2007). Some research has indeed shown that HEXACO scales outperform FFM scales in predicting criteria related to the altered or additional factors (Emotionality, Agreeableness, and Honesty-Humility), including vocational interests (McKay & Tokar, 2012), materialism, manipulativeness, delinquency, and unethical decision-making (Ashton & Lee, 2008). In some instances, Honesty-Humility is the strongest predictor in the HEXACO scale (Aghababaei & Arji, 2014). This factor has a stronger relationship with overt integrity tests than do any of the Big Five (Stewart, 2011), which often results in the HEXACO scales outperforming FFM scales in predicting overt integrity tests (Lee, Ashton, & de Vries, 2005; Marcus, Lee, & Ashton, 2007). Thus, a second proposed conceptualization of integrity equates it with the HEXACO factor Honesty-Humility.

H3. Honesty-Humility will be significantly correlated to all integrity tests.

(3) Integrity as the metatrait Stability.

In spite of the theoretical and empirical relationships between Conscientiousness and integrity tests outlined previously, some evidence suggested that Conscientiousness did not fully capture the personality construct covered by integrity tests. Although both integrity tests and Conscientiousness are moderate predictors of job performance, the relationship between integrity and job performance is only marginally reduced when the effects of Conscientiousness are partialled out (Murphy & Lee, 1994b). This indicates that the integrity test construct is more than just Conscientiousness. However, the high correlation between the two constructs indicates that Conscientiousness is still a main determinant.

Agreeableness and Neuroticism.

Individuals high in Agreeableness tend to be cooperative and trusting; individuals low in Neuroticism tend to be calm and generally in a positive mood. Employees who share these characteristics are not likely to engage in low-integrity or counterproductive behavior and are particularly unlikely to engage in interpersonal aggression and destructive behavior arising from anger and hostility. Several integrity tests, such as the Wonderlic Productivity Index, also contain these factors or similar factors as major components (typically along with conscientiousness). Many integrity tests also list subscales that are similar to the facets within these two factors (e.g., "trouble avoidance," "empathy," and "manipulativeness").

Moderate corrected correlations have been found between integrity tests and Agreeableness (.44) and Emotional Stability (.37) (Neuman & Baydoun, 1998; Sackett & Wanek, 1996). Note that based on these correlations, it appears that Agreeableness and

Emotional Stability may play just as much of a role in integrity tests as does Conscientiousness. Although Agreeableness may seem conceptually less relevant to integrity than Conscientiousness, the correlations between integrity and both Conscientiousness and Agreeableness are very similar in magnitude—in fact, Woolley and Hakstian (1992) found that several personality-based and overt integrity tests actually had higher correlations with Agreeableness than with Conscientiousness.

Extraversion and Openness to Experience.

Unlike the aforementioned factors, Extraversion and Openness to Experience appear to have little or no relationship with integrity. Several researchers have noted that the construct measured by integrity tests does not seem to contain any elements of Extraversion or openness (Ones, 1993; Wooley & Hakstian, 1992). Consistent with the null theoretical relationship between these constructs, low correlations are typically been found between integrity tests and Extraversion (.11), and Openness to Experience (.14) (Neuman & Baydoun, 1998; Sackett & Wanek, 1996).

The Superordinate Factor hypothesis.

Past research has repeatedly found that integrity tests are at least moderately related with several of the Big Five factors, specifically Neuroticism, Conscientiousness, and Agreeableness. A number of researchers have posited that integrity is essentially a blend of various personality dimensions—either a combination of personality factors or of select facets within the factors.

Ones, Schmidt, and Viswesvaran (1994a) hypothesized that integrity is part of a higher order factor—a combination of Agreeableness, Emotional Stability, and Conscientiousness from the Big Five. As noted previously, a superordinate dimension

composed of the same three factors was identified by Digman (1997) and has received more support recently (DeYoung, 2006; DeYoung, Peterson, & Higgins, 2002; Markon, Krueger, & Watson, 2005). Digman (1997) believed this metatrait (now often referred to as Stability; DeYoung, 2006) represented successful socialization (some researchers, including Digman, suggest this dimension may actually be more reflective of a socially desirable response pattern than a true communality between its three component factors). The hypothesis that integrity tests may be related to Stability is based on consistent moderate to large correlations between integrity tests and the three factors within the metatrait (e.g., Byle & Holtgraves, 2008; Murphy, 1993).

Research from Ones and colleagues (1994b), which involved correlating a composite of various integrity tests with another composite of the three relevant factors (i.e., Stability), revealed a near perfect correlation between an integrity composite and metatrait composite. Additional evidence for the relationship between integrity tests and the factors in Stability was presented via meta-analysis by Marcus, Funke, and Schuler (1997), who found significant relationships between integrity tests and each of the three factors, Conscientiousness (.29), Agreeableness (.31), and Neuroticism (-.28). Thus, a third proposed conceptualization of integrity views it as the metatrait Stability/Alpha, or higher order factor containing Conscientiousness, Agreeableness, and Neuroticism. The veracity of the model described by Ones and colleagues would be indicated through a Confirmatory Factor Analysis (CFA), with Conscientiousness, Agreeableness, Emotional Stability, and various integrity tests being caused by (or loading onto) a single latent metatrait (i.e., Stability or Alpha).

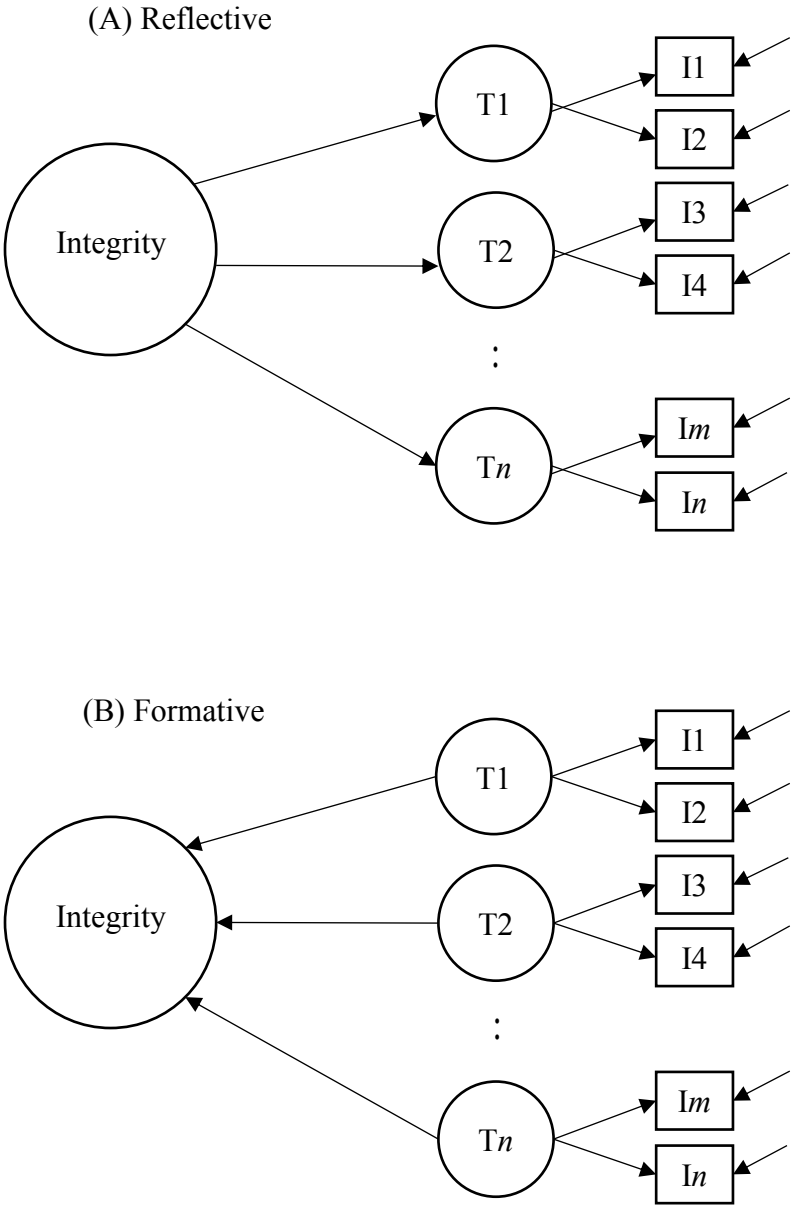
(4) Integrity as a construct formed from Conscientiousness, Agreeableness, and Neuroticism.

A fourth conceptualization of integrity may be deduced as an extrapolation of the metatrait hypothesis. As noted above, Ones et al. (1994a, 1995) argued that a single latent construct (Bollen & Lennox, 1991; Law, Wong, & Mobley, 1998) may be used to explain the dimension measured in integrity tests. In this original conceptualization, a reflective latent factor (e.g., Stability or general Integrity) accounts for the relationships observed between integrity tests, Conscientiousness, Agreeableness, and Emotional Stability. However, this hypothesis was made based mostly on the observed correlations between integrity tests and personality traits. Correlations do not imply any particular direction of causality between variables, nor do a set of correlations between various personality traits and integrity tests imply those various personality traits are intercorrelated themselves. Therefore, it is possible that instead of being a reflective construct, the trait measured by integrity tests is what is known as a formative construct (Bollen & Lennox, 1991). A formative construct such as this would be caused *by* personality traits instead of being the cause *of* them as with a reflective construct (see Figure 1 for graphical representation of this distinction between reflective and formative latent constructs).

An additional dissimilarity between reflective and formative integrity constructs is the assumed nature of the relationships between the relevant personality traits. A reflective construct is used to represent a case in which strong relationships that are observed between several variables are due to their tapping into the same construct. In a reflective model for integrity, it would then be understood that in addition to relationships

between each personality trait and integrity tests there are also relationships between the relevant traits (e.g., Conscientiousness, Agreeableness, and Neuroticism) themselves, and these relationships would arise because they all draw from a single latent factor (e.g., Stability or Integrity).

Figure 1. Graphical Depiction of Reflective and Formative Latent Variables



Conversely, a formative construct is used to represent a case in which several variables cause or form a separate construct. These models do not have any underlying assumptions about the relationships between the variables that form the resulting construct; they are essentially seen as a test battery formed by independent indicators. In a formative model for integrity, the proposed personality traits (e.g., Conscientiousness, Agreeableness, and Neuroticism) need only be related to integrity tests and do not have to uphold any intercorrelation pattern.

Several other distinctions may be made between reflective and formative latent models (see Coltman, Devinney, Midgley, & Veniak, 2008). However, because the original integrity metatrait hypothesis was based on correlational results, it is unclear which type of construct better represents the relationships between the personality factors and integrity tests. The correlations observed between personality factors and integrity tests do not allow for inferences on causality. In terms of relationships between the relevant Big Five traits, meta-analyses have shown significant correlations between Conscientiousness, Agreeableness, and Neuroticism. However, even corrected correlations between these factors rarely exceed .50 (van der Linden, te Nijenhuis, & Bakker, 2010) and thus would not be characterized as strong relationships. These strong relationships would emerge in a reflective model (assuming the latent variable is unidimensional, which simply may not be the case here).

Another way to consider this distinction between reflective and formative models is to examine the interchangeability of the indicators. The indicators of a reflective construct should be relatively identical in terms of their content—this similarity in content would give rise to the aforementioned strong correlations between indicators of a

reflective construct. However, the factors in the FFM, though overlapping, are generally considered quite distinct from one another.

Finally, indicators of a reflective construct should have relationships with antecedents and outcomes that are similar to the relationships between these antecedents/outcomes and the latent construct. Evidence obtained thus far suggests that compared to their reflective latent construct (i.e., Stability), Conscientiousness, Agreeableness, and Neuroticism do not all share similar correlation patterns with criteria such as job and contextual performance (van der Linden et al., 2010).

Although there is a clear precedent of these three traits loading onto a higher order factor (i.e., Stability or Alpha), the integrity test construct may still arise from the unrelated aspects of Conscientiousness, Agreeableness, and Neuroticism. Given the above considerations, the original metatrait hypothesis gives rise to a fourth model using the same three traits but involving a formative construct rather than a latent construct. Thus, a fourth conceptualization of integrity views it as a formative construct created by a combination of Conscientiousness, Agreeableness, and Neuroticism. Evidence for a formative model would be indicated by a CFA in which integrity tests draw from a latent integrity factor that is caused or formed by Conscientiousness, Agreeableness, and Neuroticism.

(5) Integrity as a construct formed from select personality facets.

Several concerns arose with the proposal of integrity tests measuring a superordinate factor. As noted above, the original hypothesis is based on a correlation pattern that shows typically moderate relationships between each factor and integrity tests in general (Marcus et al., 1997; Ones, 1993). Additionally, consistent with other

research on narrow traits (Ashton, 1998; Paunonen & Ashton, 2001), several researchers found that facets within the Big Five differed noticeably from their general factors in terms of their relationships with integrity tests (Costa & McCrea, 1995; Marcus et al., 2006; Murphy & Lee, 1994a). For example, compared with the broad Conscientiousness factor, some narrower traits within Conscientiousness (i.e., facet-level traits) have a stronger correlation with integrity (Murphy & Lee, 1994a). Wanek (1995) found that self-control, rather than other aspects of Conscientiousness such as hard work and orderliness, drives the correlation between general Conscientiousness and integrity. Although these concerns do not negate the evidence of the Stability–integrity test relationship presented above, they do warrant the exploration of other potential hypotheses for the position of integrity tests in the domain of personality.

The Multiple Facets hypothesis.

Considering the issues noted above, Schneider and colleagues (1996) proposed the construct measured by integrity tests can be found at a level *below* the Big Five rather than above them; thus rather than measuring a broad construct (i.e., Alpha), integrity tests would be measuring a dimensionally complex, patchwork construct made of select facets from each factor (Marcus et al., 2006). According to Marcus and colleagues (2006), the specific facets proposed to make up integrity tests may vary slightly depending on the type of integrity test (e.g., overt tests contain facets from all five factors whereas personality-based scales use facets from only four factors). However, both types are proposed to contain mostly facets that are pulled from the three factors most strongly correlated with integrity (i.e., Conscientiousness, Agreeableness, and Neuroticism).

Marcus et al. (2006) proposed that integrity tests tap into a formative construct that is created by the combination of the select facets that were found to have relatively strong correlations with integrity tests. Identifying these specific facets has not been clearly delineated in the literature. For the current study, three strategies were used to select the facets: (1) those that have been used in previous research of this model (i.e., Marcus et al., 2006), (2) those that have shown substantial correlations with a personality-based integrity test in past research (Costa & McCrae, 1995), and (3) those that have shown substantial correlations with either type of test in the current study.

Marcus and colleagues (2006) selected facets based mostly on correlations between personality-based integrity tests and personality facets that were observed past research (e.g., Costa & McCrae, 1995) and partly on their interpretation of the fundamental differences between personality-based and overt integrity tests. Marcus et al. (2006) used six facets for both personality-based and overt integrity tests ([N2] Anger, [N5] Impulsiveness, [E5] Excitement-Seeking, [A2] Morality, [C3] Dutifulness, and [C6] Deliberation) along with two additional facets for overt integrity tests ([O6] Liberalism and [A1] Trust) and four additional facets for personality-based integrity tests ([A3] Altruism, [A4] Compliance, [C2] Order, and [C5] Self-Discipline). As noted above, a general integrity factor is expected to emerge in the current study; thus, it is predicted that all facets Marcus and colleagues (2006) deemed relevant to either type of integrity test may form the general integrity factor.

Facets may also be selected based on past empirical relationships between the facets and a personality-based integrity test (Costa & McCrae, 1995). Specifically, facets that had a correlation exceeding ±.3 with an integrity test will be used: (N2) Anger, (N5)

Immoderation, (E5) Excitement-Seeking, (A2) Morality, (A4) Cooperation, (C2) Orderliness, (C3) Dutifulness, and (C6) Cautiousness. Again, due to previous evidence that has shown existence of a general integrity factor, these same facets will be used in examining both types of integrity test (represented by a latent general integrity factor).

The final strategy for selecting appropriate facets is based on correlations between personality facets and integrity tests that were observed in the current sample. Although this approach is empirically founded, it is problematic inasmuch as it involves circular analysis. Circular analysis occurs when the same data used in making predictions are then used to confirm those predictions (i.e., the same data used to determine which facets should be used in the model are then used to confirm the model). To reduce the bias inherent to circular analysis (also called "double dipping"), the sample was first randomly divided into two subsamples. The first subsample was used to determine the facets to be used as predictors, and the second subsample was used to examine the fit of the model. Facets correlated above ±.3 with any two integrity tests will be selected for this model.

None of the strategies outlined above is entirely without issue. Those based on Marcus et al. (2006) appeared to be at least partly based on the judgment of these authors rather than empirical data. Although the facets selected based on Costa and McCrae (1995) are empirically driven, the sample size in this study was relatively low ($N = 124$), making it likely that some facets may or may not be included due to sampling error (no other clearly defined integrity test was correlated with the Big 5 at the facet level). Finally, choosing facets based on relationships found in the current sample gives this model an "unfair" advantage since the proposed relationships between integrity and the facets have already been found in the data (splitting the sample in two and testing the

model on the opposite subsample helps mitigate the advantage caused by such a circular analysis, but the samples may not be seen as completely independent).

Thus, a fifth conceptualization of integrity views it as a formative construct created by the combination of particular facets from various factors. Similar to the formative construct derived from the metatrait hypothesis, evidence for a select facet formative integrity construct would be shown by a CFA in which integrity tests draw from a latent construct that is caused or formed by the proposed facets.

(6) Integrity as a previously unidentified reflective trait.

Similar to the superordinate factor hypothesis posited by Ones (1993), the select facets hypothesis was based largely on correlational research (Marcus et al., 2006). As noted previously, the correlations observed between integrity tests and personality traits—be they factors or facets—do not provide more support for either a reflective or formative model. Accordingly, the facets proposed in the fifth conceptualization may also be used in a corresponding reflective model. Thus, a sixth conceptualization of integrity views it as a reflective latent construct containing select facets from various personality factors. Like the reflective construct embodied in the metatrait hypothesis, support for a select facet reflective integrity construct would be shown by a CFA with the proposed select facets loading onto a latent integrity factor.

Summary of conceptualizations.

Of the six different conceptualizations of integrity within the domain of personality listed above, four (Models 1, 2, 3 and 5 listed below) have been reviewed recently by Viswesvaran and Ones (2016). Adding the two new reflective and formative

models based on the select facets and metatrait hypotheses, respectively, a total of six conceptualizations have been described (see Figures 2a-2f):

(1) integrity tests essentially measure the Big Five factor Conscientiousness;

(2) integrity tests essentially measure the Honesty-Humility factor of the HEXACO model;

(3) integrity tests tap into a reflective latent construct (specifically, the metatrait Stability or Alpha) on which the personality factors Conscientiousness, Agreeableness, and Neuroticism also load;

(4) integrity tests tap into a formative latent construct that is a composite of the personality factors Conscientiousness, Agreeableness, and Neuroticism;

(5) integrity tests tap into a formative latent construct that is a composite of several personality facets;

(6) integrity tests tap into a reflective construct on which several personality facets load.

For comparing the veracity of each conceptualization of the construct measured in integrity tests, an internal analysis of the structure of the integrity construct can be conducted. The first two conceptualizations can be examined as correlations between the personality factor (Conscientiousness or Honesty-Humility) and integrity tests. As is typical with reflective models, the third and sixth conceptualizations would be investigated via CFA in which the proposed factors (Conscientiousness, Agreeableness, and Neuroticism) or facets load onto the same superordinate construct as integrity tests. Contrastingly, the fourth and fifth conceptualizations would be investigated by

conducting a CFA in which integrity tests load onto a formative construct that is created by combining the proposed factors or facets.

Figure 2a. Integrity as the Big Five Factor Conscientiousness

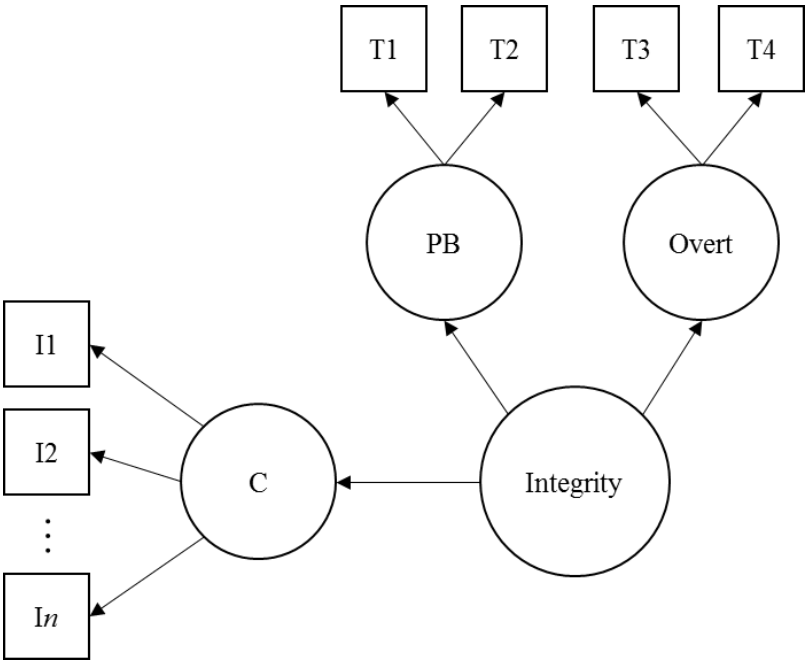


Figure 2b. Integrity as a Sixth Personality Factor (Honesty-Humility)

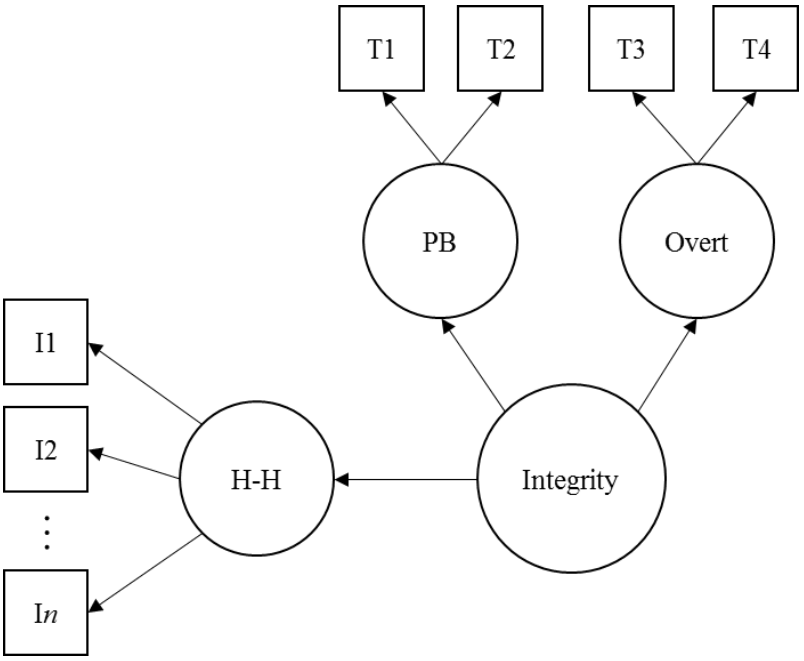


Figure 2c. Integrity as the Metatrait Stability (Conscientiousness, Agreeableness, and Neuroticism)

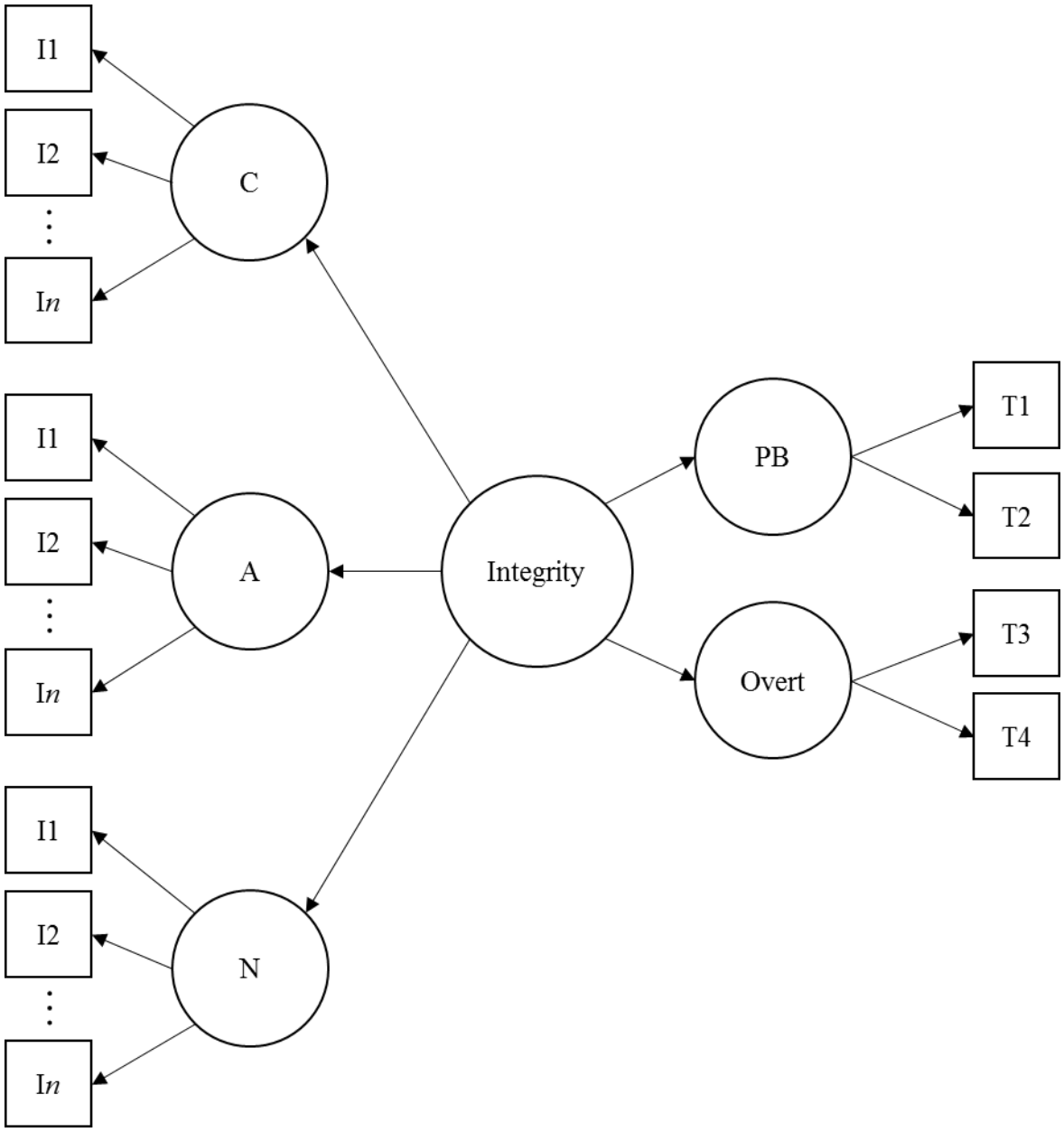


Figure 2d. Integrity as a Construct Formed from Conscientiousness, Agreeableness, and Neuroticism

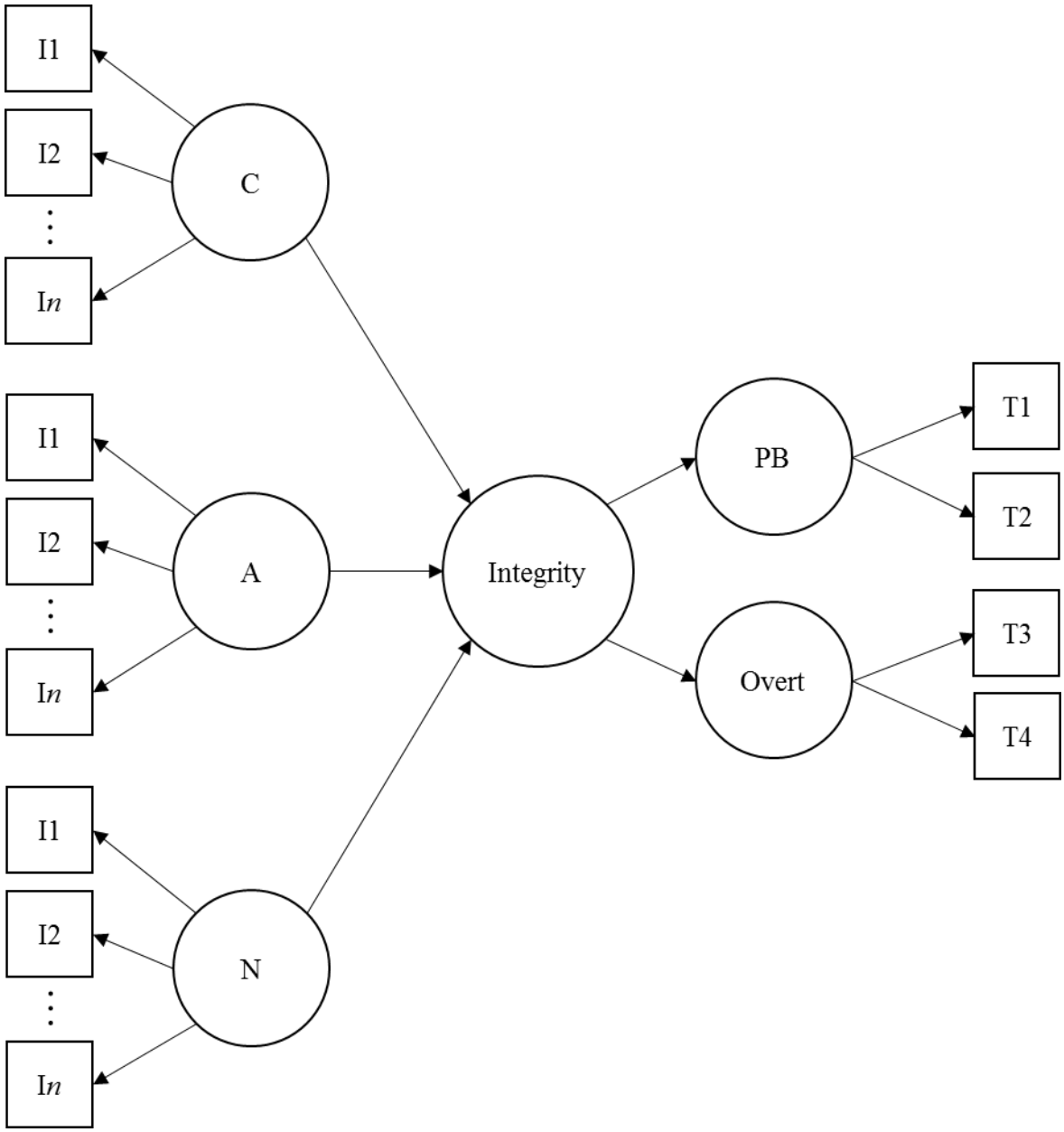


Figure 2e. Integrity as a Construct Formed from Select Personality Facets

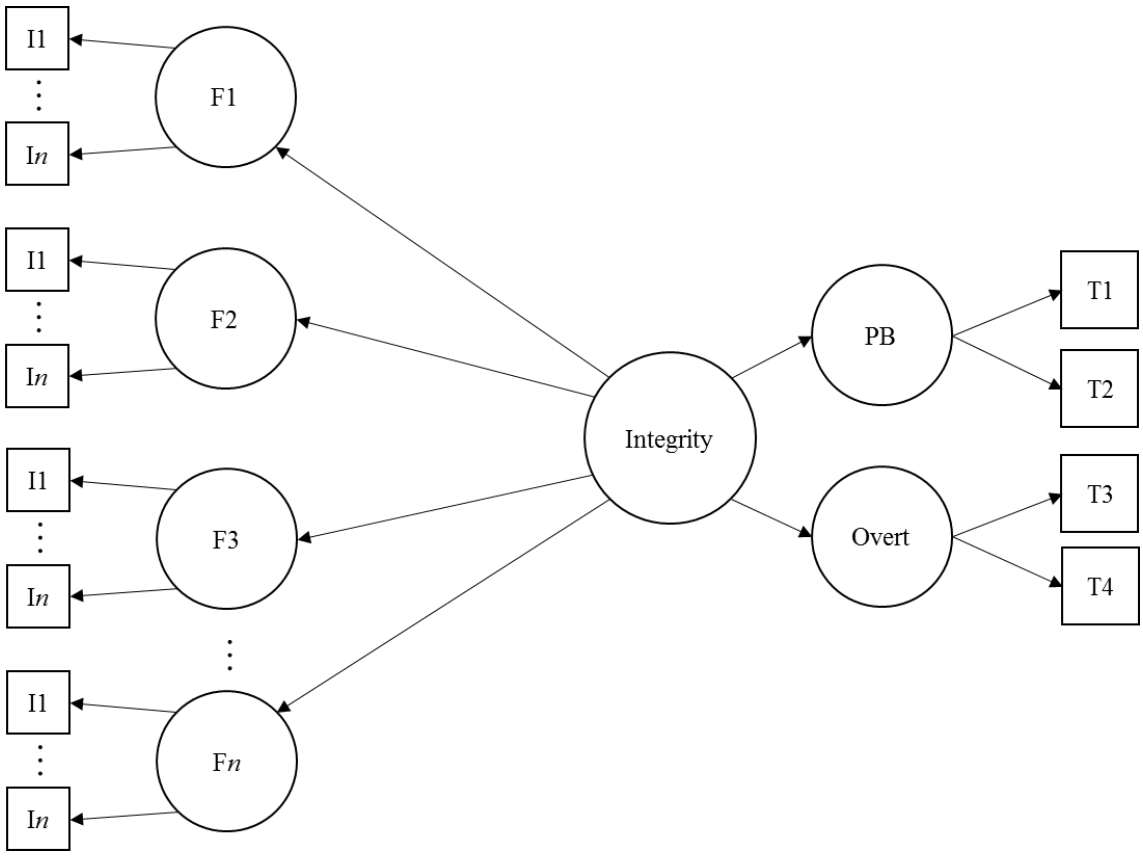
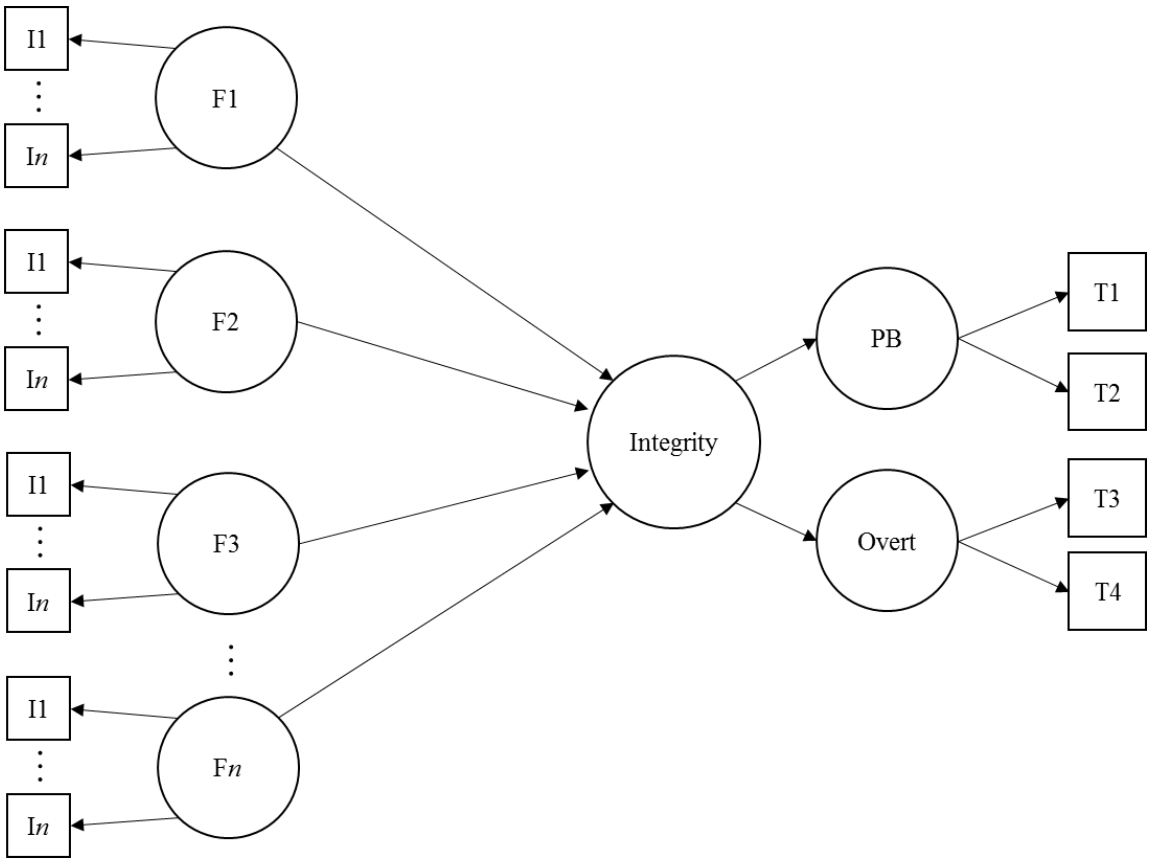


Figure 2f. Integrity as a Previously Unidentified Reflective Trait



Personality, Integrity, and Counterproductive Work Behavior

Although the internal analysis of the integrity test construct described above is an important step towards determining which conceptualization—or conceptualizations—are appropriate, several of them may ultimately fit the data and be seen as viable models. Consequently, an examination of their validity in terms of predicting an external criterion may also prove beneficial to the comparison of the utility of these conceptualizations. Though initially developed mainly to predict the narrow criterion of employee theft, integrity tests now seek to account for CWB more generally, including behaviors such as interpersonal aggression, tardiness, and absenteeism (Wanek, 1999). As such, CWB has

been chosen as the external criterion of most relevance in examining the conceptualizations of integrity.

Prior research has shown that Honesty-Humility and several of the Big Five personality traits are effective predictors of CWB (Berry, Ones, & Sackett, 2007; Bowling & Eschleman, 2010; Christian, Bradley, Craig, & Burke, 2009; Lee et al., 2005; Salgado, 2002; Smithikrai, 2008). Although most studies have focused on the relationships of CWB with Conscientiousness and Agreeableness, those investigating all of the Big 5 have found a significant relationship between Neuroticism and CWB as well (Hershcovis et al., 2007; Hitlan & Noel, 2009; Sackett, Berry, Wiemann, & Laczo, 2006). Considering the conceptualizations of integrity previously outlined, this pattern of relationships suggests personality traits may influence CWB through the integrity test construct.

The proposition that the relationship between personality traits and CWB is explained mainly through an integrity construct may be examined via Structural Equation Modeling (SEM). To test this, two models could be created for each of the six integrity conceptualizations: one in which only the latent integrity construct has a direct path to CWB and one in which both the latent integrity construct and personality trait(s) have direct paths to CWB. If the personality trait(s) mainly predict CWB through variance shared with integrity tests, the direct path between the personality trait(s) and CWB in the second model should be non-significant.

As noted earlier, a similar approach of partialling out the effects of traits from integrity was taken by Murphy and Lee (1994b) in their examination of the role of Conscientiousness and integrity in predicting performance. In finding that the partial

relationship (controlling for integrity) between Conscientiousness and performance was drastically reduced whereas the partial relationship (controlling for Conscientiousness) between integrity and performance was only slightly reduced, they suggested that integrity included but was "more" than Conscientiousness. Thus, in the event any model has a non-significant path between the trait(s) and CWB when the effects of an integrity construct are partialled out, it would be appropriate to view integrity as a broader construct that contains the trait(s) used in the model (i.e., integrity is a higher order factor of the trait[s] in question). Conversely, if a significant relationship between the trait(s) and CWB remained, it might be concluded that the integrity construct does not entirely subsume the traits(s) in the model.

This analysis may also be useful in identifying which conceptualization is most appropriate. Given that integrity tests are created for the very purpose of predicting CWB, the integrity model that best predicts CWB could potentially viewed as the most useful—and consequently the most valid—conceptualization of integrity.

CHAPTER III. METHOD

Participants

Participants were 436 psychology students from a large university in the southeastern United States. Participants were recruited through a university research participation module. Students who volunteered for the study received course credit. Participants were predominantly female (78%) and were 22.67 years old on average. The sample was 75% Hispanic, 7% Caucasian, and 11% African American (7% all other ethnic groups). Ninety percent of the participants were single and eight percent married. In order to ensure that participants would be able to legitimately respond to all measures (i.e., those that asked about their workplace behavior), participants were required to have been employed for at least 6 months at some point in their lives. The majority (90%) of the sample was employed at the time of the study, working an average of 27.43 hours per week. A copy of the IRB approval form is presented in Appendix A.

Measures

Two scales were used to measure personality, two scales were used to measure integrity, and one scale was used to measure CWB. Several demographics variables were also obtained from participants.

Personality.

Big Five. The IPIP-NEO-120 (Johnson, 2014) was used to measure the Big Five factors and 30 subordinate facets (McCrae & Costa, 2008b): Neuroticism (Anxiety, Anger, Depression, Self-Consciousness, Immoderation, and Vulnerability as facets), Extraversion (Friendliness, Gregariousness, Assertiveness, Activity Level, Excitement-Seeking, and Cheerfulness as facets), Openness to Experience (Imagination, Artistic

Interests, Emotionality, Adventurousness, Intellect, and Liberalism as facets), Agreeableness (Trust, Morality, Altruism, Cooperation, Modesty, and Sympathy as facets), and Conscientiousness (Self-Efficacy, Orderliness, Dutifulness, Achievement-Striving, Self-Discipline, and Cautiousness as facets). This shortened 120-item version of the original 300-item IPIP-NEO measure of the Big Five at the facet level has demonstrated psychometric qualities highly comparable to the longer (300-item) version. Each item asks respondents to indicate to what extent they agree with a statement (e.g., that they "Take advantage of others," from the Agreeableness scale). Responses to each item are recorded on a Likert scale from 1 (*Strongly Disagree*) to 5 (*Strongly Agree*).

HEXACO. The HEXACO-60 (Ashton & Lee, 2009) was used to measure the HEXACO factors. Reliability estimates of the HEXACO-60 are slightly lower than reliabilities for longer HEXACO scales, though still within the acceptable range ($\alpha >$ .75). Aside from its slightly lower reliability, the HEXACO-60 has very similar properties to longer HEXACO scales. Items ask respondents to what extent they agree with a statement (e.g., "I wouldn't use flattery to get a raise or promotion at work, even if I thought it would succeed," from the Honesty-Humility scale). Responses to each item are recorded on a Likert scale from 1 (*Strongly Disagree*) to 5 (*Strongly Agree*).

Integrity tests.

Inventory of Job-Related Attitudes and Self-Evaluation (IBES). The IBES (Marcus, 2006) measures integrity with 115 items designed to resemble content from both overt and personality-based commercial scales. The overt scale (60 items) contains four subscales: General Trust, Perceived Counterproductivity Norms, Counterproductivity Rationalizations, and Counterproductive Behavioral

Intentions/Fantasies. The personality-based scale (55 items) contains five subscales: Manipulativeness, Trouble Avoidance, Positive Self-Concept, Reliability/Dependability, and Stimulus Seeking. The subscales correspond to themes typically measured in other integrity tests (Wanek, Sackett, & Ones, 2003), with the exception of General Trust and Manipulativeness. General Trust items measure attitudes on whether individuals are trustworthy, whereas Manipulativeness items measure a propensity for interpersonal forms of potential counterproductivity that are typically not measured in other integrity tests. Adequate reliability has been shown for the total measure, overt and personality-based scales, and subscales (Marcus, 2006). Responses to each item are recorded on a Likert scale from 1 (*Strongly Disagree*) to 5 (*Strongly Agree*).

Squares. The integrity test *squares* developed by cut-e is a commercial personality-based assessment that contains 36 items. The test measures an overall integrity dimension, Trustworthiness, which is divided into two large factors: Impulse Control and Ethical Awareness. These large factors are split into three facets each, which are measured with six items per facet (three positively worded and three negatively worded). Impulse control contains the facets Discipline, Conscientiousness, and Cautiousness; Ethical Awareness contains the facets Empathy, Honesty, and Reflectiveness. Responses are recorded using a sliding scale (0 to 100) with three normative anchors: *Holds less true for me than for others*, *Holds equally true for me and for others*, and *Holds more true for me than for others*.

Squares has demonstrated acceptable psychometric properties in previous work using the scale (Cut-e, 2013). In a standardization sample of 335 people, the internal consistency (using Cronbach's α) of the facets ranged from .71 (Empathy) to .90

(Cautiousness), the factors Impulse Control and Ethical Awareness had respective internal consistencies of .90 to .85, and the overall scale had an internal consistency of .92. Scores on the scale also correlated highly with interviewer ratings and self-ratings of the broad squares dimensions (overall, factors, and facets).

Counterproductive work behavior.

***Counterproductive Work Behavior Checklist* (*CWB-C*).** The CWB-C (Spector et al., 2006) contains 32 items and assesses five aspects of CWB: Abuse, Production Deviance, Sabotage, Theft, and Withdrawal. Responses are made on a frequency-based Likert scale that ranges from 1 to 7 (1 = *Never*, 2 = *Less than Once a Month*, 3 = *Once a Month*, 4 = *2-3 Times a Month*, 5 = *Once a Week*, 6 = *2-3 Times a Week*, 7 = *Daily*). A sample item from the Sabotage subscale asks respondents to indicate how often they "purposely wasted [their] employer's materials/supplies."

Procedure

Data for the study was gathered through online surveys. All measures except the cut-e integrity test were taken via the Qualtrics internet testing site. The Squares integrity test was administered online through a separate web testing module developed by cut-e. The study was split into two surveys. Participants were sent a link to the second set of measures one week after completing the first set and were given 1 week to complete the second set of tests; thus the time interval between the two waves of data collection ranged from 7 to 14 days. Data for the IPIP-NEO-120, CWB-C, Squares, and demographics were collected during the first wave of data collection, while the HEXACO and IBES were administered in the second wave of data collection. Each survey also contained several screening items (e.g., "Please mark 'Strongly Disagree' for this item") designed

to determine if participants were attentively reading each item and responding purposefully.

CHAPTER IV. RESULTS

Data Preparation and Analysis Approach

All statistical analyses were conducted in SPSS/Amos 19 and Mplus Version 7. Before any analyses were conducted, the data were examined for various issues that may lead to biased results. Because all models involved both integrity tests (IBES and Squares), cases that did not complete both waves of data collection (and consequently would be missing scores for one) were removed from the dataset used in the model testing. The remaining cases were screened for inattentive responding based on incorrect responses to test items (e.g., "Please select 'Strongly Agree' for this item") embedded within the measures. The data were then evaluated for nonmodel outliers by checking for individual leverage scores 4 times greater than the mean leverage score (mean = 0.07, max = 0.24); model-based outliers were determined by checking for standardized DfBetas greater than 1.96 from OLS regressions based on the relationships represented in the models being tested (max = 0.56).

Indices of skewness and kurtosis for most study variables were not above an absolute value of 0.86 and 1.52, respectively, with the exception of the CWB scale. Because the CWB scale measures the frequencies of behaviors that are relatively uncommon in the workforce, the variables derived from this measure (total and subscales) were positively skewed (skewness range = 1.51-3.79, mean = 2.77) and leptokurtotic (kurtosis range = 2.40-18.21, mean = 10.01). Mardia's coefficient was statistically significant in the models tested, indicating the data are multivariately non-normally distributed. To deal with the undesirable effects of non-normality on parametric tests (i.e., bias of estimates and statistical significance), MLMV estimation

was used in SEM models containing CWB. MLMV estimation deals with non-normality by correcting the standard errors and chi-squared test statistic.

Several fit indices were examined for each model to provide a comprehensive examination of each conceptualization's fit to the data (Boomsma, 2000; Jackson, Gillaspy, & Purc-Stephenson, 2009). The fit indices examined included the model χ^2 and its corresponding *p*-value (using the Bollen-Stine corrections for analyses involving bootstrapping), Tucker-Lewis Index (TLI), Comparative Fit Index (CFI), Root Mean Square Error of Approximation (RMSEA) and the corresponding closeness of fit (PCLOSE), and the Standardized Root Mean Square Residual (SRMR). These fit indices may be used to classify models as having excellent, good, adequate, or poor fit (Hu & Bentler, 1999). After inspecting fit indices, modification indices and standardized residual covariances were examined as indicators of ill fit in specific parts of the model.

Statistical Analyses

Means, standard deviations, correlations, and scale reliabilities of study variables are presented in Table 1. For simplicity, the correlations between personality facets are not presented; instead, the correlations of personality facets with the integrity tests and CWB are presented in Table 2. The reliabilities of the facet scales (used in calculating error variances for single-indicator latent variables) are also shown in Table 2. To simplify comparison of model fit between the various conceptualizations of integrity, all model fit statistics are presented in Table 3.

Table 1. Means, Standard Deviations, Reliability Estimates, and Correlations

	Mean	SD	α	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. CWB	39.87	8.07	.83															
2. Squares	2290.77	343.84	.92	-.38														
3. IBES (Total)	389.57	38.69	.93	-.37	.59													
4. IBES (Overt)	204.39	22.90	.89	-.33	.53	.94												
5. IBES (PB)	182.72	17.85	.84	-.37	.58	.90	.71											
6. N (IPIP)	68.99	13.24	.88	.20	-.34	-.32	-.26	-.34										
7. E (IPIP)	82.55	10.90	.85	-.08	.16	.04	.10	-.03	-.50									
8. O (IPIP)	83.54	8.97	.75	.05	.03	.00	.01	-.02	-.11	.29								
9. A (IPIP)	88.14	9.54	.82	-.31	.44	.51	.45	.51	-.29	.16	.25							
10. C (IPIP)	90.61	10.82	.87	-.33	.62	.52	.44	.54	-.47	.29	.07	.36						
11. H (HEX)	33.70	4.87	.59	-.27	.40	.62	.60	.53	-.26	-.02	.05	.39	.27					
12. E (HEX)	33.77	5.38	.70	-.05	.12	.17	.17	.12	.39	-.13	-.10	.24	.05	.03				
13. X (HEX)	33.77	5.75	.75	-.14	.26	.23	.26	.15	-.53	.65	.20	.21	.33	.10	-.12			
14. A (HEX)	32.30	5.77	.74	-.24	.31	.42	.31	.50	-.41	.14	.10	.47	.22	.32	-.06	.24		
15. C (HEX)	37.20	5.39	.78	-.26	.50	.62	.56	.59	-.08	.04	.05	.33	.56	.34	.23	.27	.18	
16. O (HEX)	34.54	5.44	.69	.01	.06	.17	.17	.13	-.18	.22	.58	.15	.10	.08	-.05	.22	.16	.21

Note: *N* ranges from 301 to 422. Squares reliability based on Cut-e (2013). Correlations greater than an absolute value of .11 are significant at $p < .05$.

Table 2. Means, SDs, Reliabilities, and Correlations of Factors and Facets with Integrity Tests and CWB

	α	Whole Sample (N = 350-422)				Subsample 1 (N = 151)			
		IO	IPB	Squares	CWB	IO	IPB	Squares	CWB
N (IPIP)	.88	-.30	-.36	-.35	.28	-.39	-.42	-.35	.33
N1 Anxiety*	.75	-.19	-.18	-.16	.15	-.35	-.30	-.21	.23
N2 Anger	.85	-.16	-.34	-.27	.22	-.17	-.30	-.25	.25
N3 Depression*	.80	-.28	-.32	-.29	.21	-.32	-.38	-.26	.24
N4 Self-Consciousness	.61	-.07	-.02	-.11	.14	-.23	-.16	-.30	.20
N5 Immoderation*	.61	-.45	-.30	-.34	.21	-.25	-.31	-.31	.23
N6 Vulnerability*	.72	-.30	-.33	-.29	.21	-.38	-.33	-.25	.25
E (IPIP)	.85	.16	.02	.17	-.10	.25	.10	.23	-.15
E1 Friendliness	.74	.25	.19	.20	-.13	.36	.27	.27	-.22
E2 Gregariousness	.73	.15	.03	.12	-.07	.31	.15	.20	-.13
E3 Assertiveness	.81	.14	.01	.16	-.03	.17	.08	.22	.00
E4 Activity Level	.50	.16	.07	.24	-.10	.11	.01	.25	-.09
E5 Excitement-Seeking*	.67	-.31	-.41	-.33	.12	-.30	-.39	-.32	.05
E6 Cheerfulness	.72	.18	.18	.23	-.15	.25	.21	.22	-.18
O (IPIP)	.75	.00	.01	.01	.02	-.08	-.08	-.08	-.02
O1 Imagination	.66	-.13	-.18	-.16	.18	-.27	-.26	-.23	.20
O2 Artistic Interests	.72	.08	.09	.14	-.13	.06	.05	-.01	-.14
O3 Emotionality	.49	.17	.21	.24	-.07	.06	.11	.16	-.06
O4 Adventurousness	.61	.03	-.01	-.04	-.04	.07	.01	-.04	-.15
O5 Intellect	.60	.15	.16	.14	-.04	.07	.07	.11	.03
O6 Liberalism	.53	-.28	-.19	-.24	.19	-.28	-.24	-.24	.08
A (IPIP)	.82	.44	.50	.46	-.28	.39	.42	.40	-.30
A1 Trust	.85	.20	.18	.17	-.05	.25	.15	.17	-.09
A2 Morality*	.69	.48	.52	.48	-.28	.45	.51	.42	-.27
A3 Altruism	.68	.32	.35	.41	-.16	.21	.29	.33	-.15
A4 Cooperation*	.61	.38	.51	.36	-.29	.38	.43	.31	-.31

	α	Whole Sample (N = 350-422)				Subsample 1 (N = 151)			
		IO	IPB	Squares	CWB	IO	IPB	Squares	CWB
A5 Modesty	.65	.04	.13	.04	-.12	.01	.14	-.02	-.10
A6 Sympathy	.67	.22	.15	.28	-.14	.10	.01	.25	-.15
C (IPIP)	.87	.44	.52	.63	-.35	.35	.50	.59	-.30
C1 Self-Efficacy	.72	.33	.31	.42	-.12	.25	.27	.39	-.16
C2 Orderliness	.73	.15	.24	.30	-.23	.15	.24	.28	-.20
C3 Dutifulness*	.65	.38	.42	.54	-.27	.27	.34	.45	-.19
C4 Achievement-Striving*	.66	.39	.39	.49	-.25	.29	.34	.47	-.23
C5 Self-Discipline*	.69	.29	.31	.43	-.27	.25	.33	.38	-.22
C6 Cautiousness*	.84	.30	.44	.41	-.25	.23	.44	.40	-.20
H (HEX)	.57	.61	.54	.40	-.28	.67	.50	.34	-.24
E (HEX)	.70	.18	.14	.12	-.01	.09	.08	.10	.05
X (HEX)	.77	.28	.15	.26	-.17	.40	.28	.33	-.33
A (HEX)	.75	.31	.51	.31	-.24	.34	.53	.32	-.26
C (HEX)	.78	.55	.57	.50	-.29	.63	.62	.50	-.25
O (HEX)	.69	.16	.16	.06	-.04	.14	.15	.01	-.04

Note: IO = IBES Overt, IPB = IBES Personality-Based. Correlations are significant at $p < .05$ when $r > .11$ (whole sample) or $r > .15$ (subsample 1). Facets selected for use in an integrity model based on Marcus et al. (2006) are in **bold**; those selected for use based on Costa and McCrae (1995) are in *italics*; those selected for use based on correlations from the current study are indicated with an asterisk (*).

Table 3. Fit Statistics for CFA and SEM Models

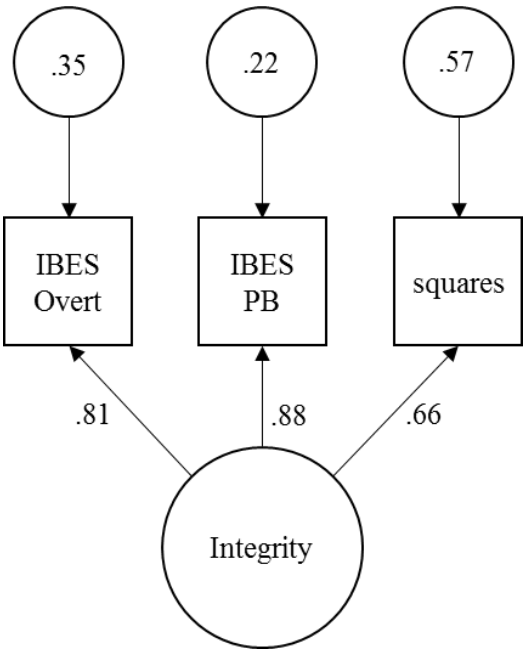
	df	χ^2	B-S *p*	TLI	CFI	RMSEA	PClose	SRMR	R^2
General Integrity Factor CFA	0	---	---	---	---	---	---	---	
SEM Model	1	.01	.94	1.00	1.00	.00	.96	.00	.33
Model 1 (C) CFA	1	1.24	.27	1.00	1.00	.03	.43	.01	
SEM Base	4	2.14	.71	1.00	1.00	.00	.71	.01	.31
SEM Partial	3	1.80	.61	1.00	1.00	.00	.82	.01	.32
Model 2 (H-H) CFA	1	5.49	.02	.94	.99	.12	.07	.02	
SEM Base	4	13.94	.01	.94	.98	.09	.08	.03	.25
SEM Partial	3	13.25	<.01	.92	.98	.11	.04	.03	.26
Model 3 (C, A, N; reflective)	5	8.52	.13	.98	.99	.05	.45	.02	
SEM Base	10	10.88	.37	1.00	1.00	.02	.83	.02	.31
SEM Partial	7	8.17	.32	1.00	1.00	.02	.73	.02	.34
Model 4 (C, A, N; formative)	6	8.67	.19	.99	1.00	.04	.58	.02	
SEM Base	11	11.22	.42	1.00	1.00	.01	.87	.02	.31
SEM Partial	8	8.39	.40	1.00	1.00	.01	.81	.02	.34
Model 5 (select facets, formative)									
Model 5a (Marcus et al., 2006)	23	62.48	<.01	.87	.97	.08	.03	.02	
SEM Base	37	82.66	<.01	.90	.97	.06	.10	.03	.23
SEM Partial	25	63.06	Improper Solution (Standardized Loading > 1)						
Model 5b (Costa & McCrae, 1995)	15	48.84	<.01	.89	.97	.09	.01	.03	
SEM Base	25	61.54	<.01	.92	.97	.07	.07	.03	.24
SEM Partial	17	50.01	Improper Solution (Standardized Loading > 1)						
Model 5c (current sample)	21	42.62	.02	.90	.98	.08	.07	.03	

SEM Base	34	48.75	.14	.95	.98	.05	.40	.03	.24
SEM Partial	23	43.42		Improper Solution (Standardized Loading > 1)					
Model 6 (select facets, reflective)									
Model 6a (Marcus et al., 2006)	34	84.42	<.01	.89	.97	.07	.04	.03	
SEM Base	48	103.88	<.01	.91	.96	.06	.11	.03	.24
SEM Partial	36	84.97		Improper Solution (Standardized Loading > 1)					
Model 6b (Costa & McCrae, 1995)	25	49.56	.02	.95	.98	.06	.28	.03	
SEM Base	35	62.63	.02	.96	.98	.05	.43	.03	.24
SEM Partial	27	50.72		Improper Solution (Standardized Loading > 1)					
Model 6c (current sample)	21	42.62	.17	.95	.97	.06	.32	.04	
SEM Base	34	48.75	.29	.97	.97	.05	.60	.04	.24
SEM Partial	23	43.42		Improper Solution (Standardized Loading > 1)					

Note: $N = 301$ for all models except Models 5c and 6c ($n = 151$). B-S p = Bollen-Stine p, TLI = Tucker-Lewis Index, CFI = Comparative Fit Index, RMSEA = Root Mean Square Error of Approximation, SRMR = Standardized Root Mean Square Error, AIC = Akaike Information Criterion, BIC = Baysian Information Criterion. SEM Base = SEM model with only latent integrity predicting CWB; SEM Partial = SEM model with both latent integrity and model traits predicting CWB.

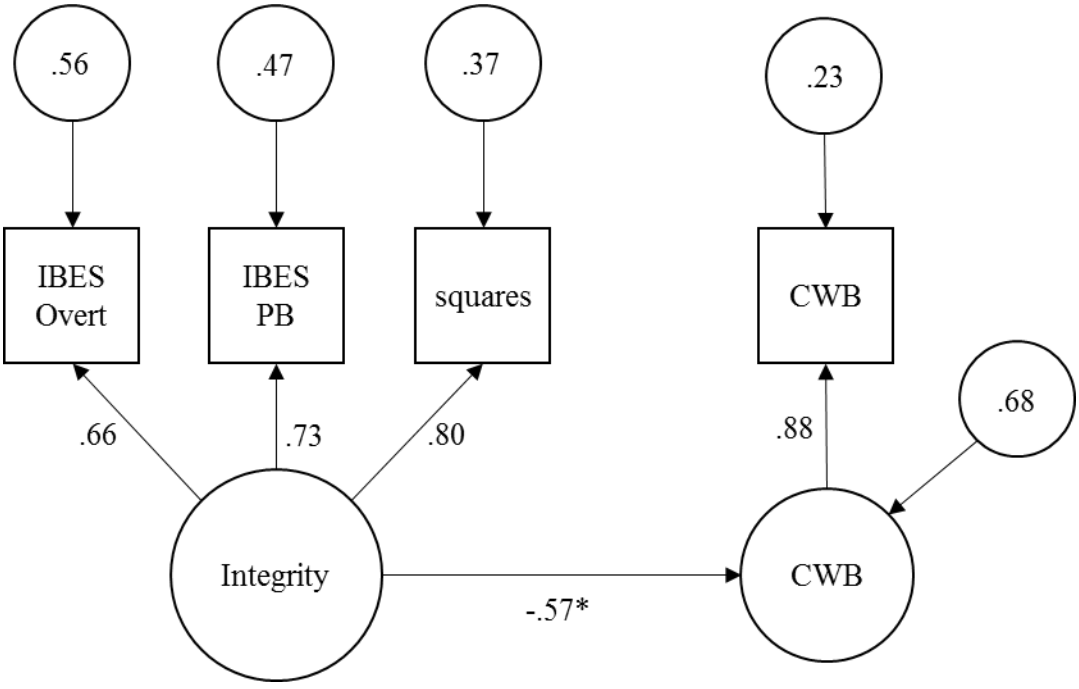
The correlations between Squares and the Overt IBES ($r = .53$, $p < .001$), Squares and the Personality-Based IBES ($r = .58$, $p < .001$), and the Overt IBES and Personality-Based IBES ($r = .71$, $p < .001$) were all significant and large, which supports H1. A general integrity model was tested in a CFA framework using the IBES Overt, IBES Personality-Based, and Squares integrity tests as indicators. However, modeling a single latent variable with three indicators results in a just-identified model. Although fit indices are not available for the model, the factor loadings (.81, .88, and .66 for the Overt IBES, Personality-Based IBES, and Squares, respectively) indicate that the integrity tests are within the normal range for factor loadings. Moreover, the general integrity factor accounted for the majority of the variance in the two IBES scales and near the majority of the variance in Squares. Overall, it may be concluded that the general integrity factor common to both types of integrity test that has been found in previous research (e.g., Ones, 1993) also emerged in the current study. A model using the above integrity factor as a predictor of CWB (Figure 3b) had good fit, with integrity accounting for 33% of the variance in CWB.

Figure 3a. General Integrity Model



Note: All factor loadings are significant at $p < .05$.

Figure 3b. Predictive General Integrity Model



Note: all factor loadings are significant at $p < .05$; * indicates $p < .05$.

The integrity model just described (i.e., latent integrity with the squares and both IBES scales as indicators) was used as a base for the six conceptualizations outlined previously. However, these subsequent models included more variables, thus the need for constraining the paths of both IBES scales to be equal was no longer necessary given the additional *df*. These additional *df* allowed models to be adjusted where appropriate to improve fit. Almost all models originally had very poor fit; the modification indices typically suggested that the error terms of various constructs should be correlated. As such, error terms or latent variable disturbance terms of scales within the same test when they are used as indicators (e.g., the two IBES scales or the IPIP factors or facets) were allowed to correlate when suggested by modification indices. Similarly, the covariance between latent variables representing factors or facets was estimated when they were used as predictors.

As direct measures of integrity, the total scores of the two IBES scales and Squares were used as indicators of integrity. The various personality factors and facets were transformed into single-indicator latent variables before being used as predictors (formative models) or indicators (reflective models). These single-indicator latent variables were created using the total score of each factor or facet as the indicator and fixing the error variance to a predetermined value (calculated as $\sigma_i \times (1-\alpha)$, where σ_i is the observed variance for a given personality factor or facet and α is the reliability observed in the current sample. CWB was also formed as a single-indicator latent variable using the CWB-C total score as the indicator and the observed reliability for the error variance calculation.

The six aforementioned conceptualizations of integrity were examined in a CFA/SEM framework. Each conceptualization was first tested independently (internal analysis) using the relationships previously delineated to build the appropriate model (see Figures 4a, 5a, 6a, 7a, 8a-c, and 9a-c). For conceptualizations using a reflective integrity factor, the three integrity tests and corresponding latent personality traits (formed as single-indicator latent variables) were used as indicators. Conceptualizations using a formative integrity factor were modeled with the integrity factor as a linear combination of the corresponding latent personality traits. However, we include a disturbance term for the formative factor to account for the possibility that there are other variables contributing to the integrity construct (Bollen & Bauldry, 2011).

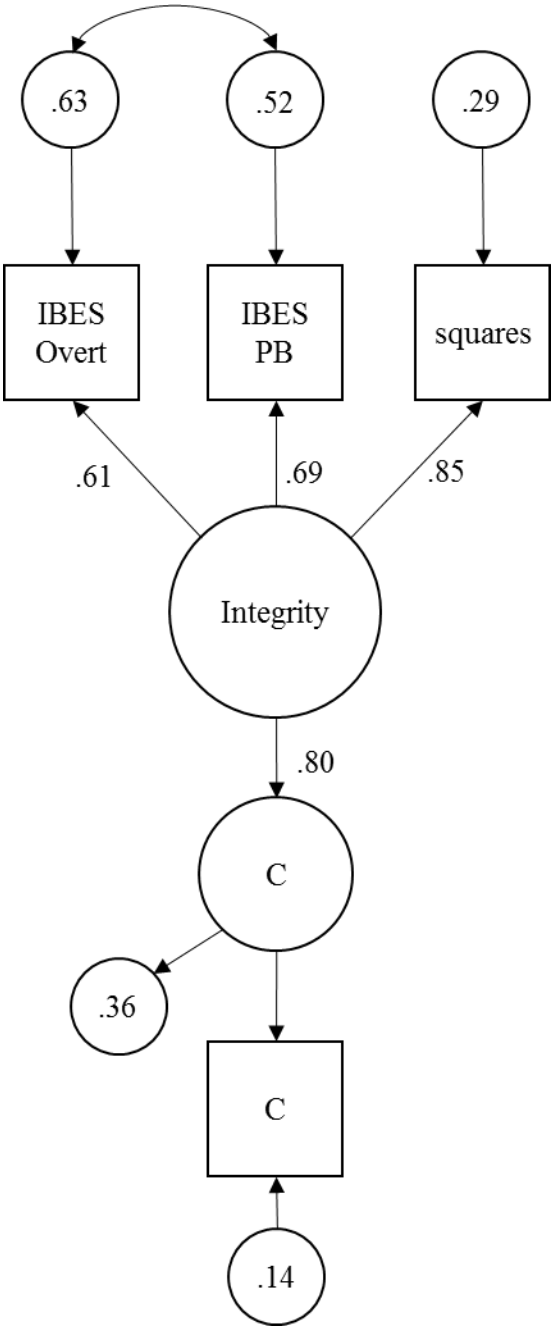
Subsequently, one or two SEM models were run for each conceptualization (external analysis): a "base model" with the latent integrity factor predicting CWB (see Figures 4b, 5b, 6b, 7b, 8b, and 9b) and a "partial model" with both the latent integrity factor and the proposed trait(s) in each conceptualization predicting CWB (see Figures 4c, 5c, 6c, and 7c).

Attempts to run several models resulted in improper solutions with standardized loadings greater than 1.00 (i.e., Heywood cases). Improper solutions are typically the result of low sample sizes, misspecified models, and/or low factor loadings (Boomsma & Hoogland, 2001). Another potential cause of Heywood cases is high multicollinearity among model variables (Chen, Bollen, Paxton, Curran, & Kirby, 2001). This is the likely cause of the improper solutions in the current models, as they contained several variables that were highly correlated. To confirm that multicollinearity was indeed the root of the issues, the Variance Inflation Factor (VIF) for the predictors in each model was

examined; a relatively high VIF was indeed observed in predictors for all models that had improper solutions.

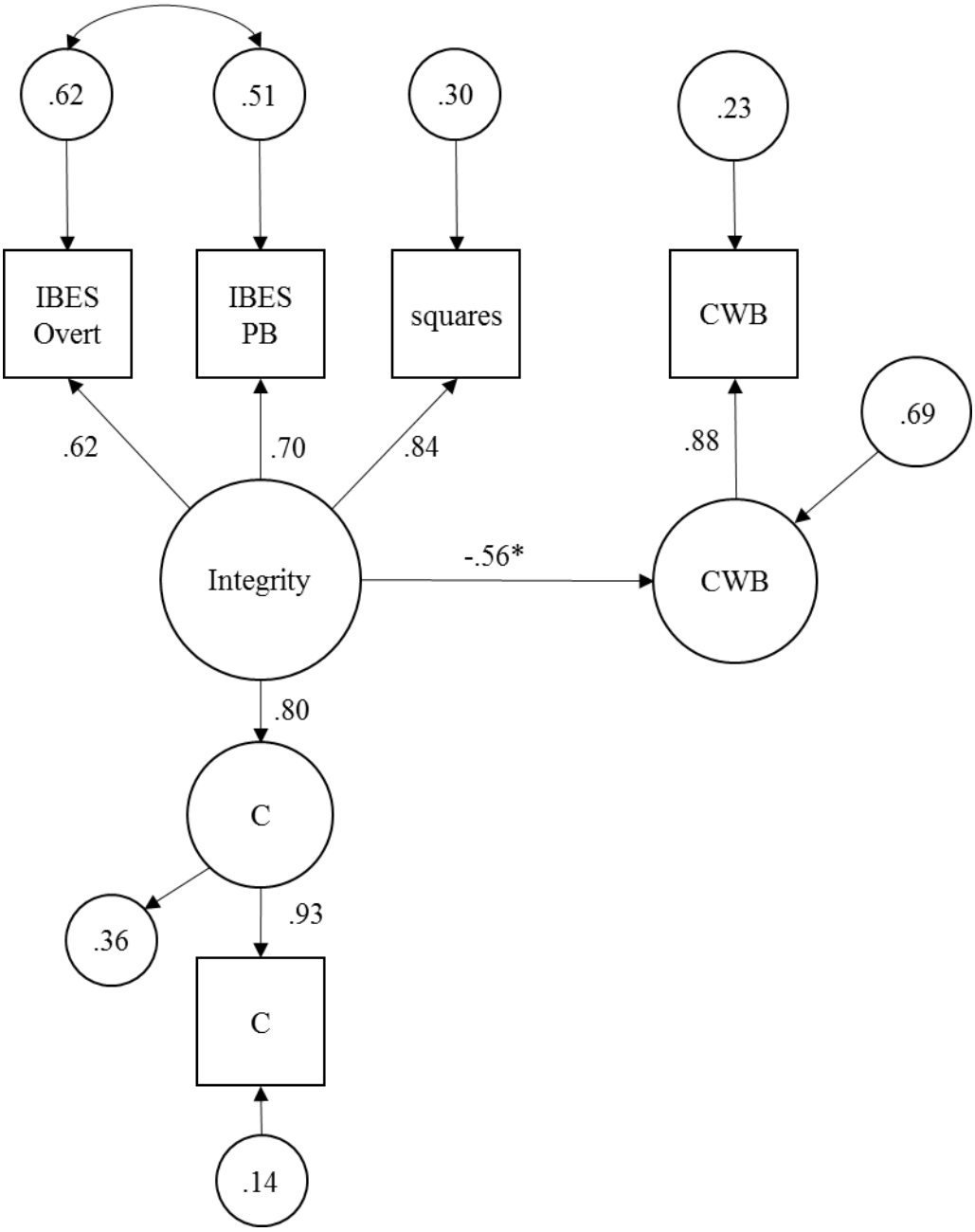
Conscientiousness was significantly correlated with Squares ($r = .63$, $p < .001$), Overt IBES ($r = .44$, $p < .001$), and Personality-Based IBES ($r = .52$, $p < .001$), which provides support for H2. Naturally, a model adding Conscientiousness as an indicator of the latent integrity factor (Figure 4a) had good fit. When used as a predictor of CWB (Figure 4b), this conceptualization of integrity accounted for slightly less variance (31% total) than the model containing only integrity tests. Figure 4c demonstrates that the direct relationship between Conscientiousness and CWB is nonsignificant when the variance shared by integrity is partialled out; conversely, the relationship between integrity and CWB does not decrease when Conscientiousness is partialled out.

Figure 4a. CFA for Conceptualization 1



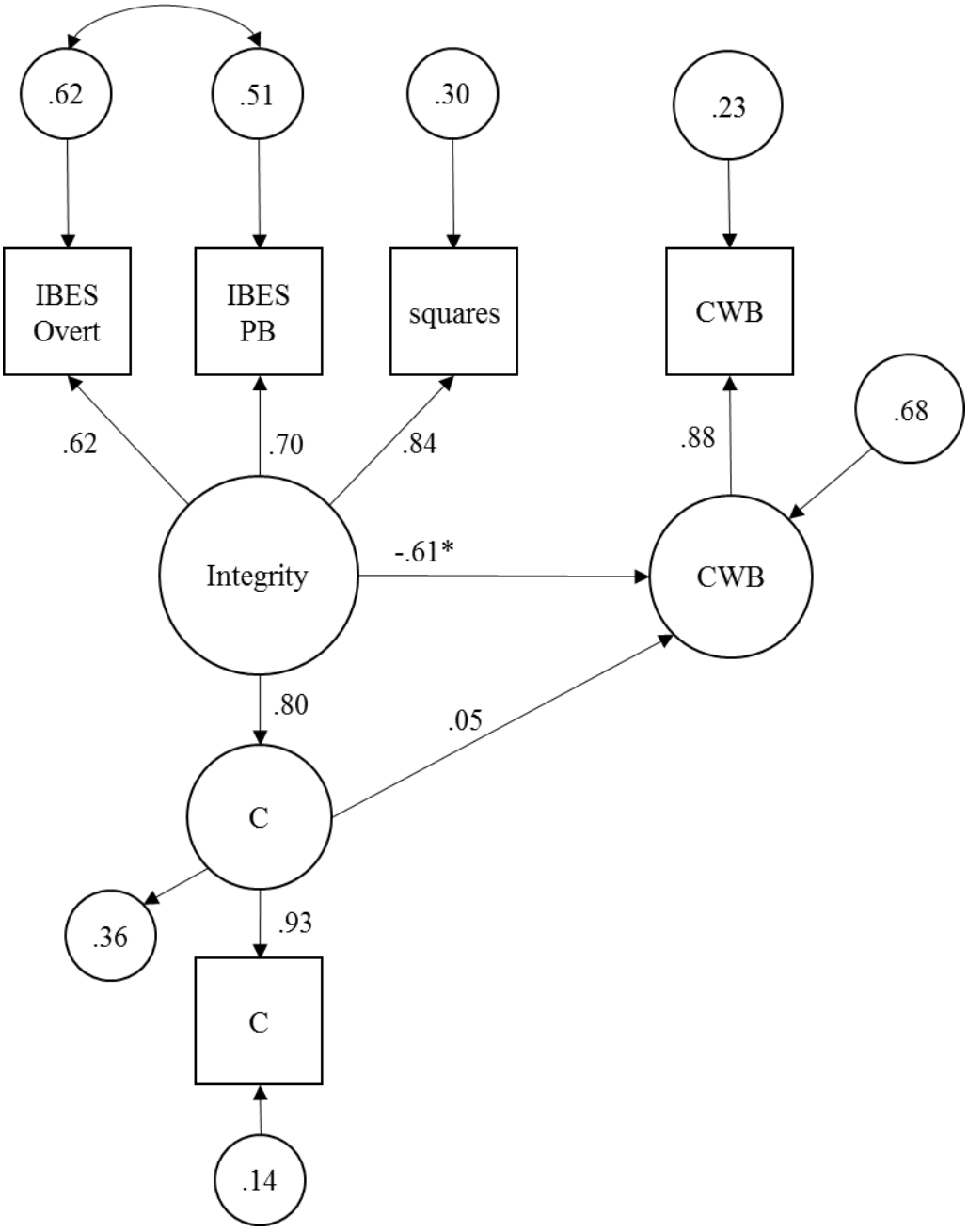
Note: all factor loadings are significant at $p < .05$.

Figure 4b. Base Prediction Model for Conceptualization 1



Note: all factor loadings are significant at $p < .05$; * indicates $p < .05$.

Figure 4c. Partial Prediction Model for Conceptualization 1



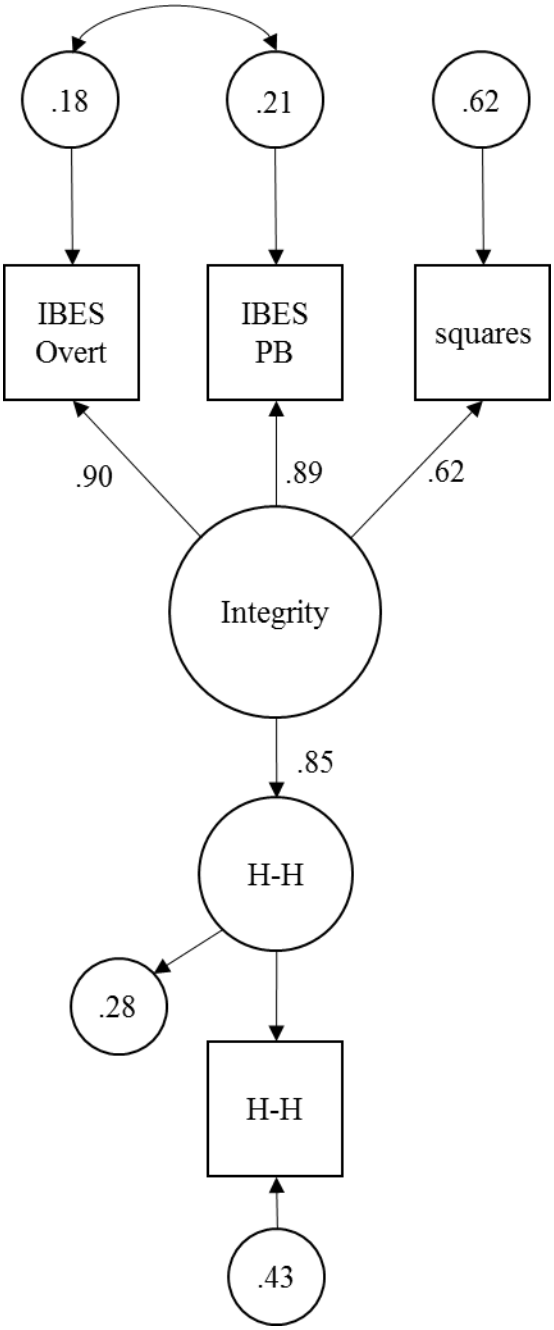
Note: all factor loadings are significant at $p < .05$; * indicates $p < .05$.

Honesty-Humility was significantly correlated with Squares ($r = .40$, $p < .001$), Overt IBES ($r = .61$, $p < .001$), and Personality-Based IBES ($r = .54$, $p < .001$), providing support for H3. A model with Honesty-Humility as an additional indicator of latent integrity (Figure 5a) fit the data excellent. This model of integrity accounted for much less variance (25% total) in CWB (Figure 5b) than the integrity factor with only integrity tests as indicators. Similar to Conscientiousness, the relationship between Honesty-Humility and CWB became nonsignificant when integrity was partialled out, whereas the partial relationship between integrity and CWB did not decrease (Figure 5c).

A CFA testing the third conceptualization of integrity (with Conscientiousness, Agreeableness, and Neuroticism included with the integrity tests as indicators) had good fit (Figure 6a). The model using this conceptualization of integrity as a predictor of CWB (Figures 6b) had excellent fit and accounted for 31% of the variance in CWB. When added to the model, direct paths from Conscientiousness, Agreeableness, and Neuroticism to CWB were not significant (Figure 6c).

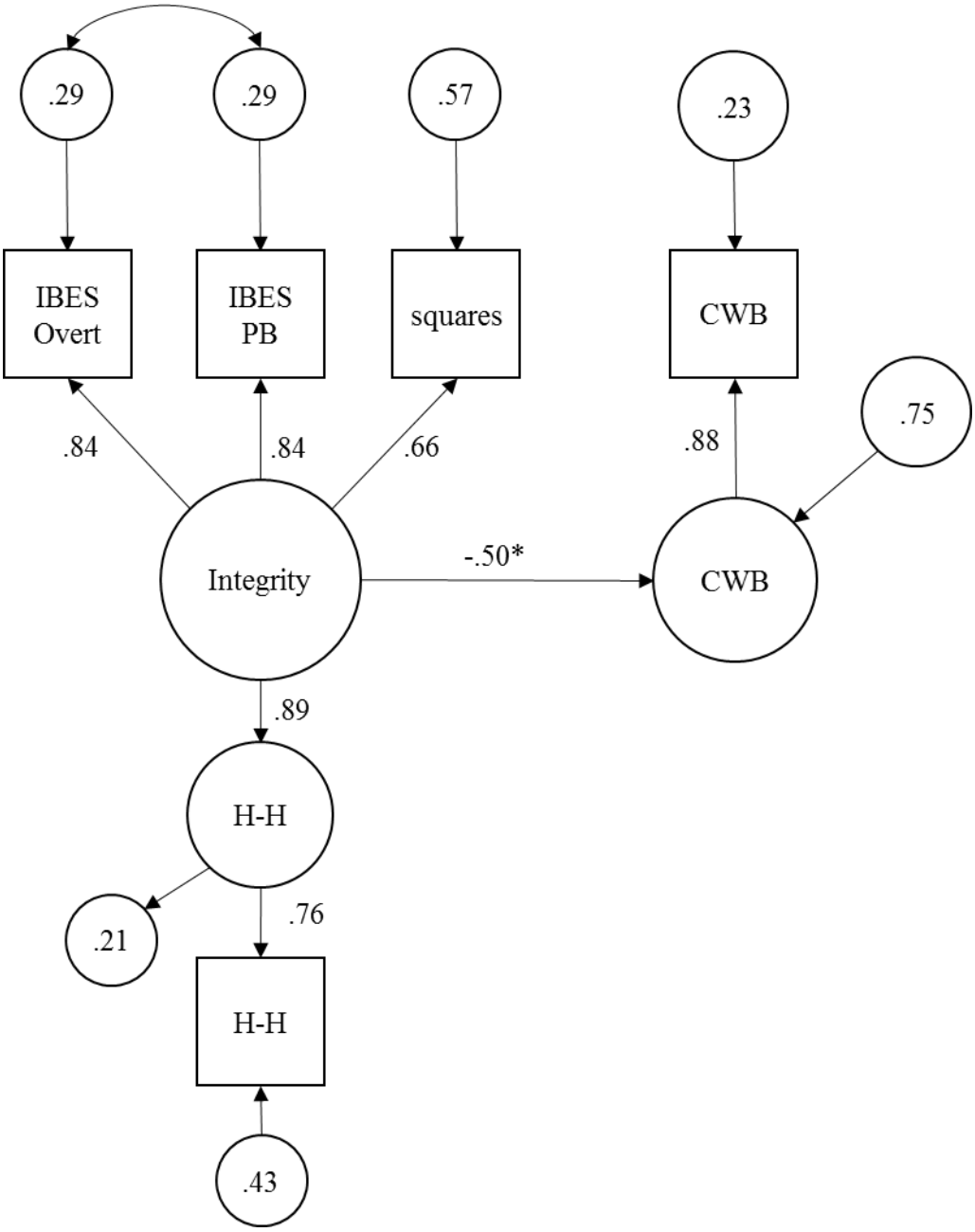
Because they essentially presume the same covariance structure, the models representing fourth conceptualization of integrity (as a construct formed by Conscientiousness, Agreeableness, and Neuroticism) had similar fit to those from the third conceptualization. This model of integrity accounted of 31% of the variance in CWB. Again, the relationship of each personality factor to CWB was nonsignificant when integrity was partialled out, whereas integrity remained a significant predictor.

Figure 5a. CFA for Conceptualization 2



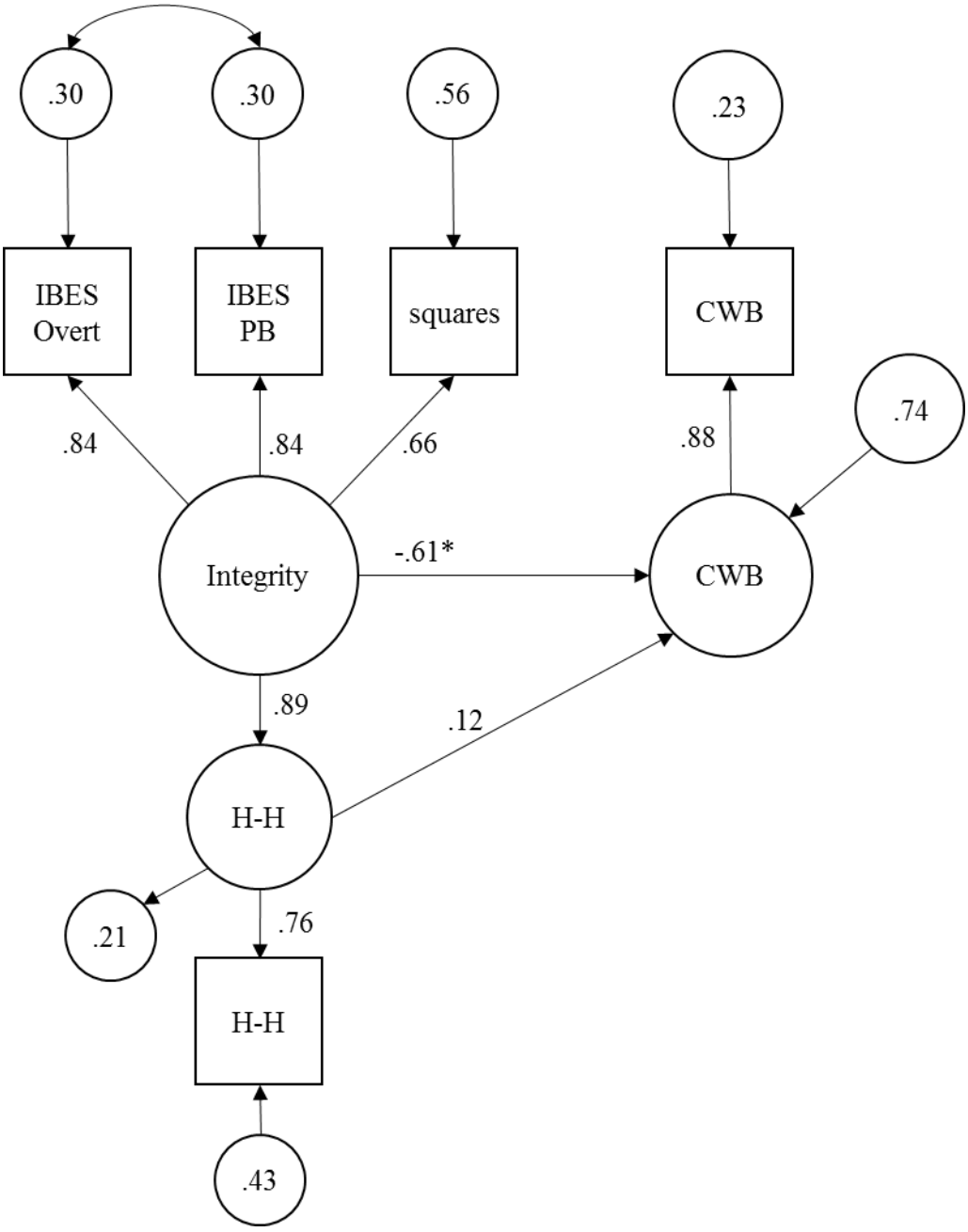
Note: all factor loadings are significant at $p < .05$.

Figure 5b. Base Prediction Model for Conceptualization 2



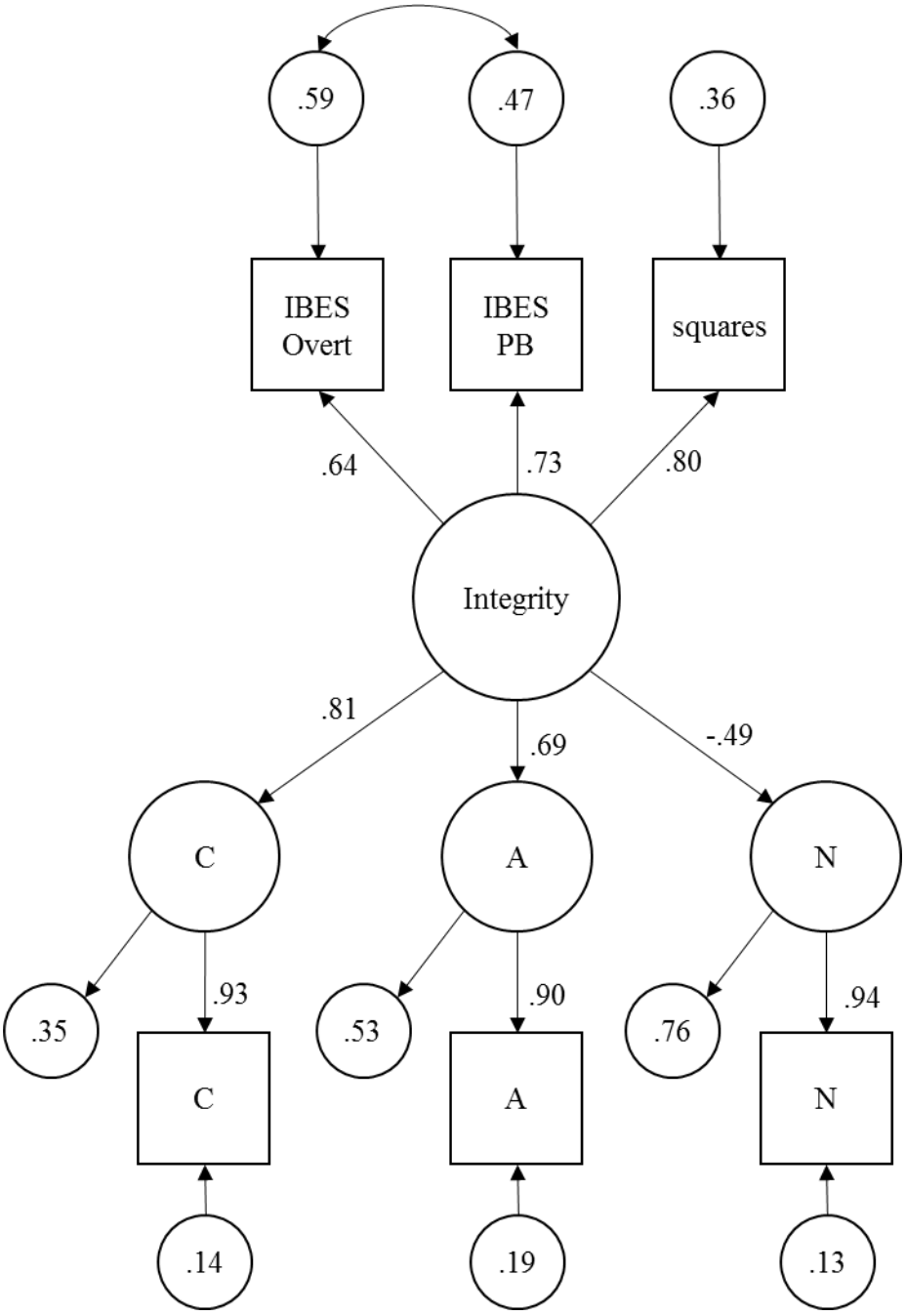
Note: all factor loadings are significant at $p < .05$; * indicates $p < .05$.

Figure 5c. Partial Prediction Model for Conceptualization 2



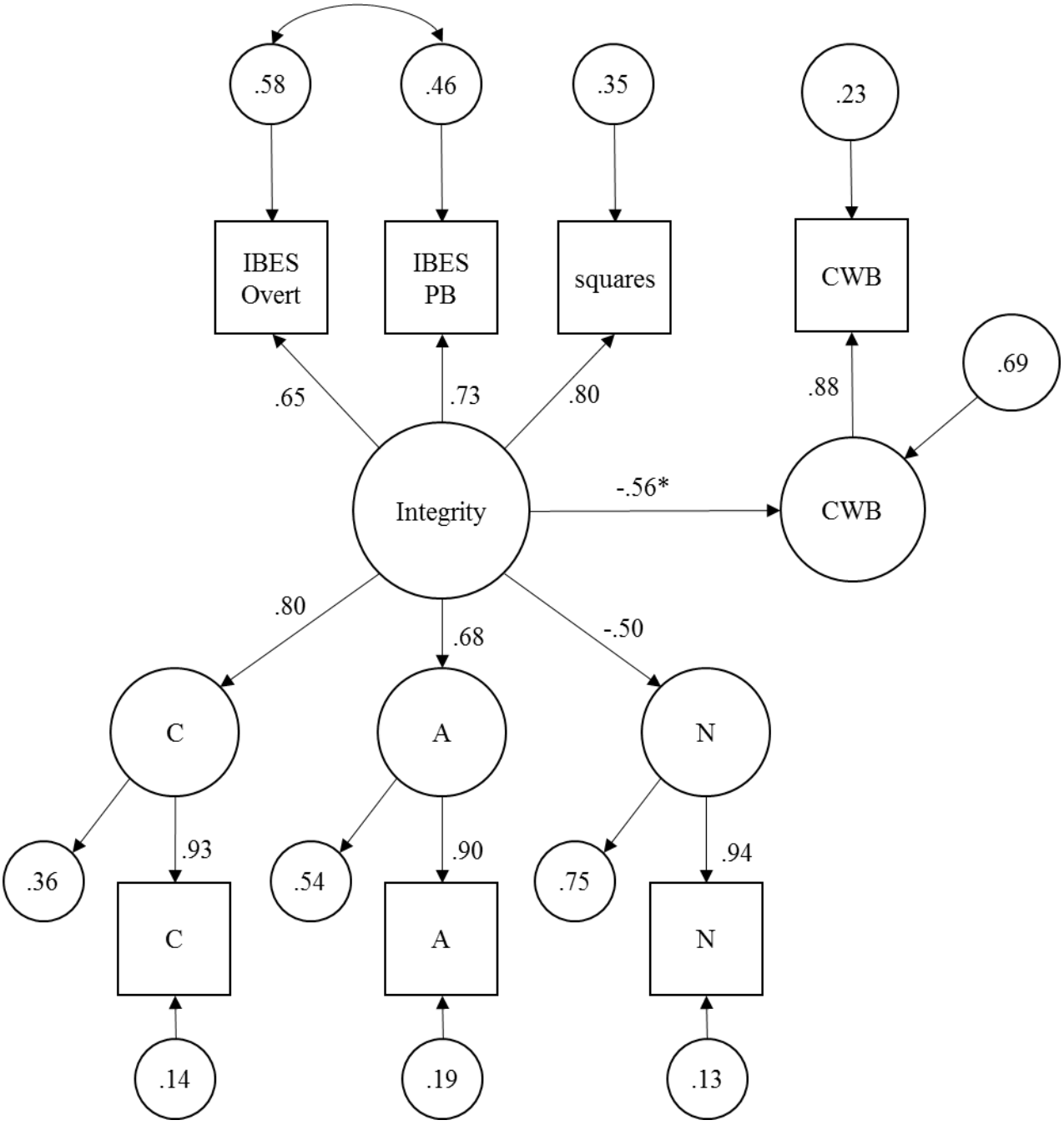
Note: all factor loadings are significant at $p < .05$; * indicates $p < .05$.

Figure 6a. CFA for Conceptualization 3



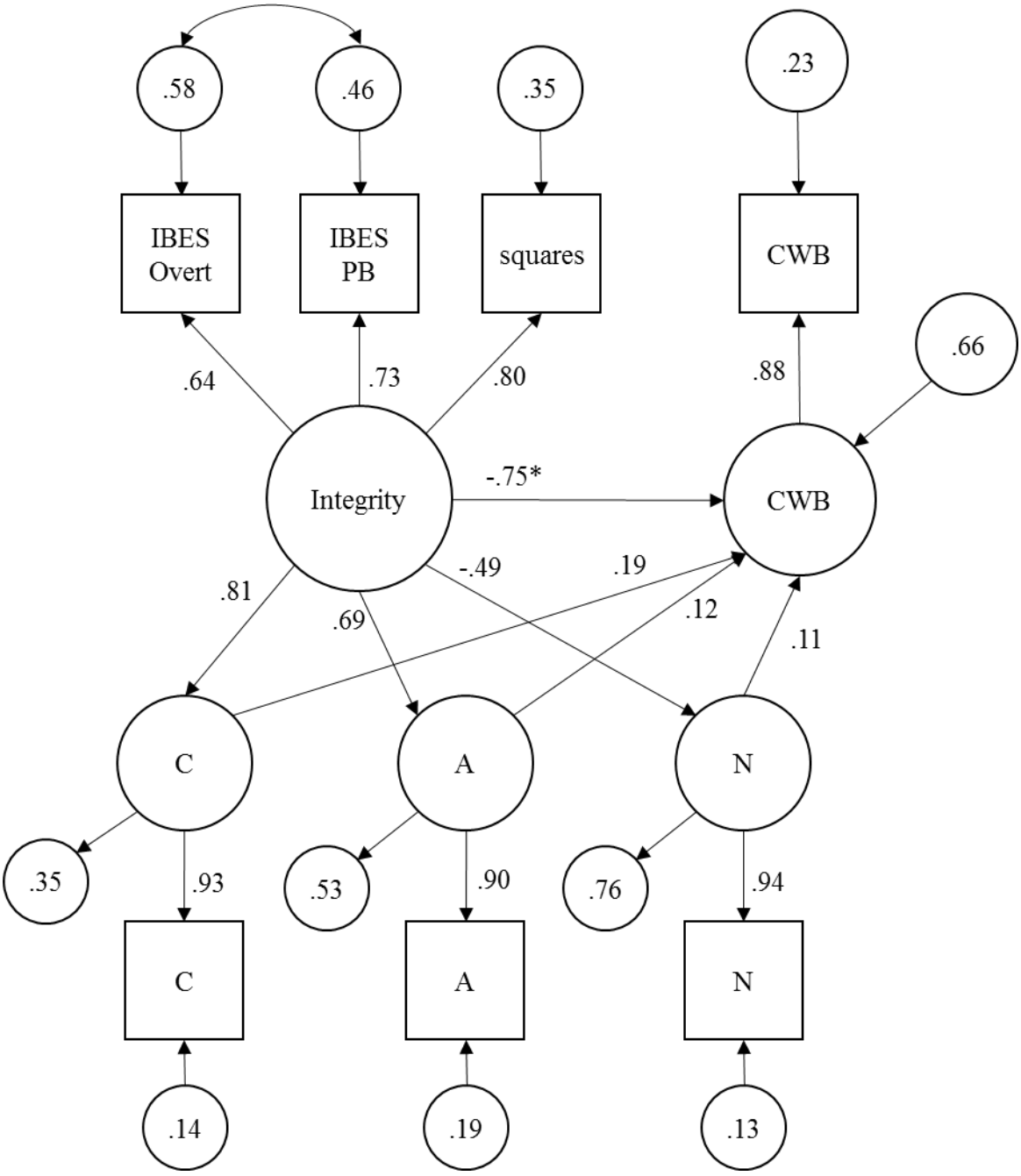
Note: error terms of latent personality traits are correlated; all factor loadings are significant at $p < .05$.

Figure 6b. Base Prediction Model for Conceptualization 3



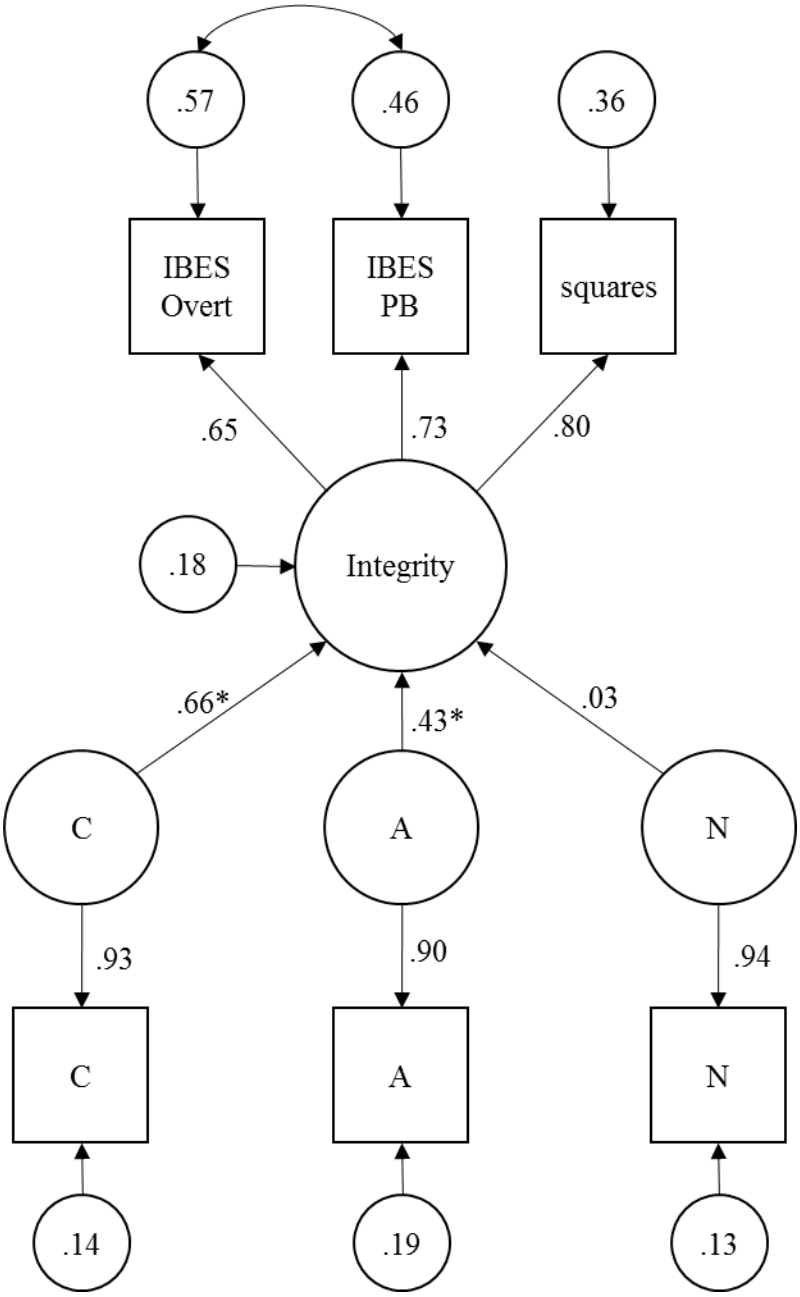
Note: error terms of latent personality traits are correlated; all factor loadings are significant at $p < .05$; * indicates $p < .05$.

Figure 6c. Partial Prediction Model for Conceptualization 3



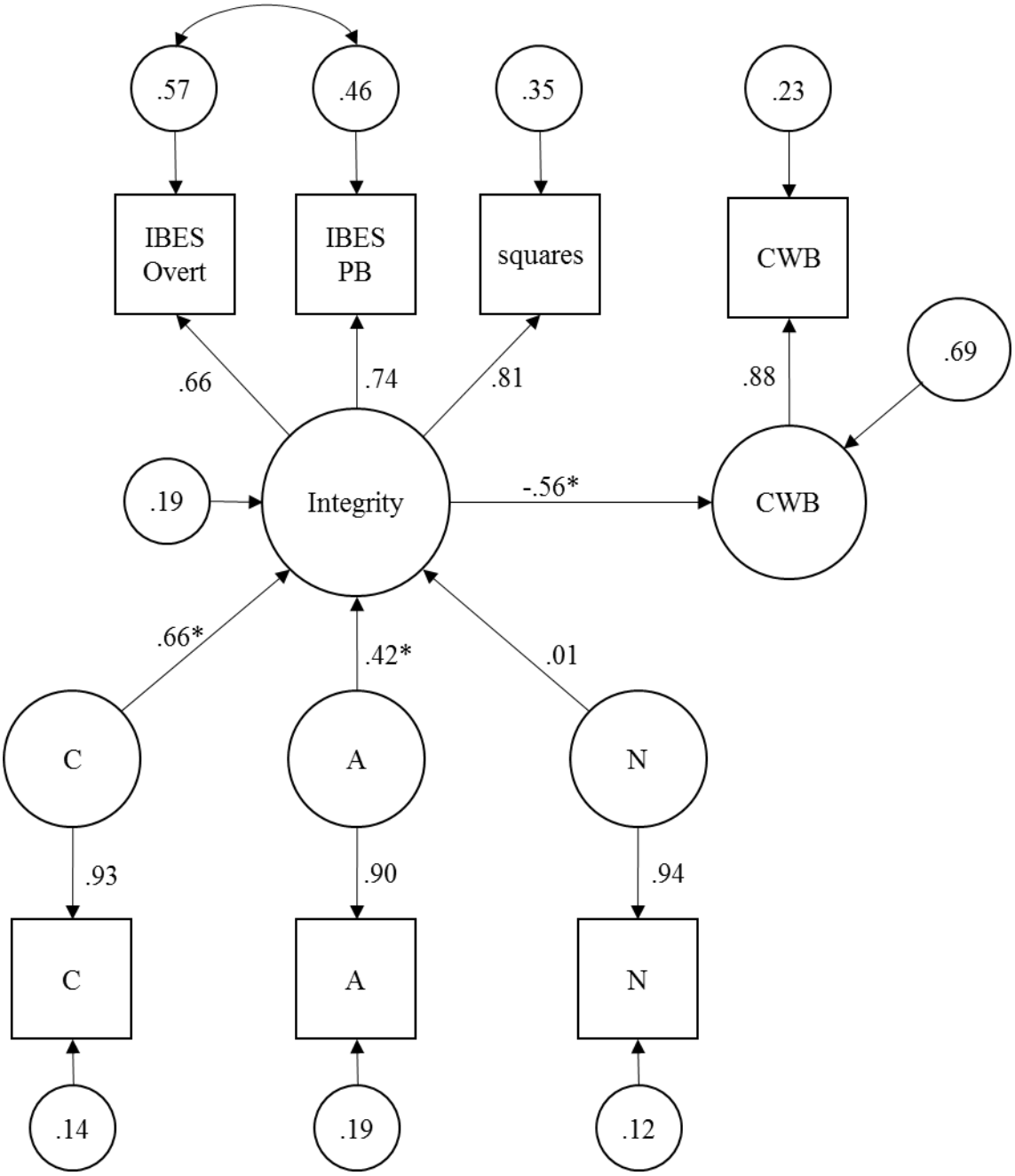
Note: error terms of latent personality traits are correlated; all factor loadings are significant at $p < .05$; * indicates $p < .05$.

Figure 7a. CFA for Conceptualization 4



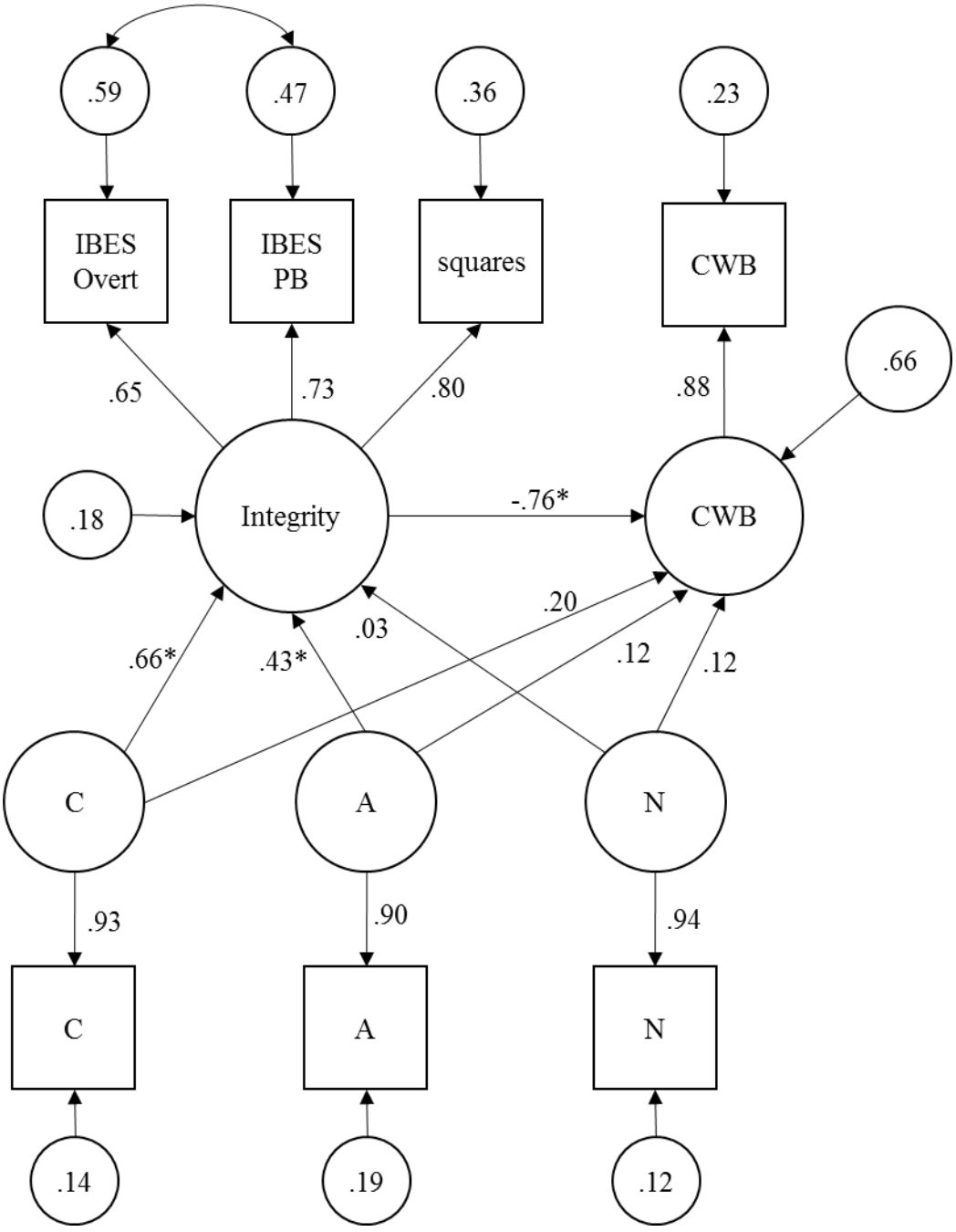
Note: latent personality traits are correlated; all factor loadings are significant at $p < .05$.

Figure 7b. Base Prediction Model for Conceptualization 4



Note: latent personality traits are correlated; all factor loadings are significant at $p < .05$; * indicates $p < .05$.

Figure 7c. Partial Prediction Model for Conceptualization 4



Note: latent personality traits are correlated; all factor loadings are significant at $p < .05$; * indicates $p < .05$.

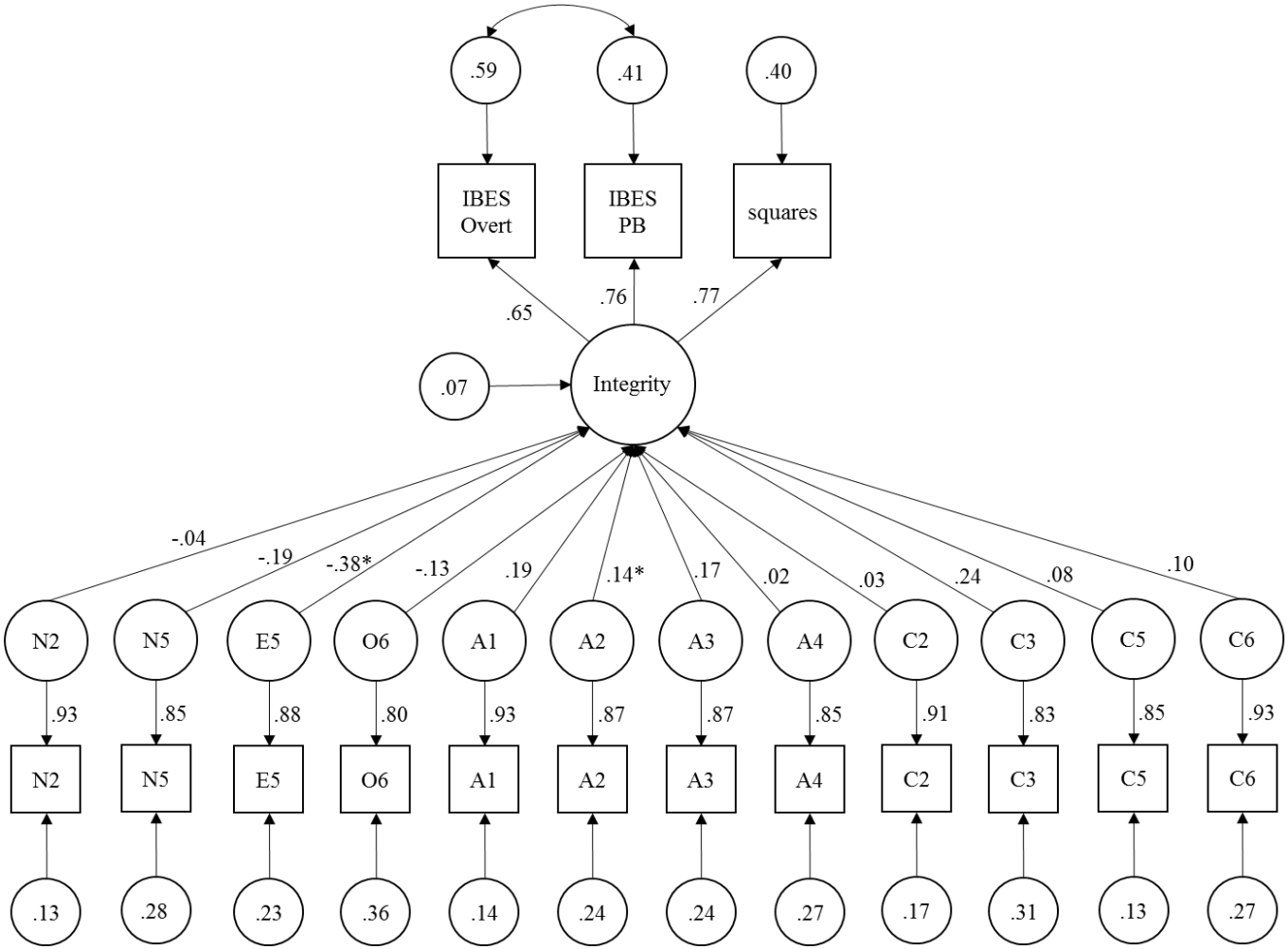
The results for the fifth conceptualization of integrity are shown in Figures 8a-f. Following the strategy outlined above for selecting personality facets from the current sample, the following were selected: (N6) Vulnerability, (E5) Excitement-Seeking, (A2) Morality, (A4) Cooperation, (C1) Self-Efficacy, (C3) Dutifulness, (C5) Self-Discipline, and (C6) Cautiousness. It should be noted that for models under the fifth and sixth conceptualizations of integrity, Mplus returns a message warning that an issue existed in the output. However, none of the types of problems suggested by the program (e.g., standardized loadings > 1, negative variances) were observed in the output in some cases. The same parameter estimates were observed when running the models in SPSS Amos but without any error warnings. Therefore, the results of these models are reported from Amos, which uses a maximum likelihood estimation. Bootstrapping was used to help correct for issues pertaining to the non-normality of CWB, but results should be interpreted with caution.

In general, the fifth conceptualization of integrity fit the data worse than previous conceptualizations, although still within the acceptable ranges for most fit indices. The integrity factor based on the facets selected based on the current sample provided the best fit for the data, followed by the facets selected based on Costa and McCrae (1995), followed by the facets selected by Marcus et al. (2006). These models explained less CWB variance (23-24% total) than those containing the larger Big 5 factors. The models containing direct paths from the facets to CWB resulted in improper solutions for all variants of the fifth conceptualization.

Results for the sixth conceptualization of integrity (see Figures 9a-f) are similar to those for the fourth conceptualization. Model fit was slightly better in general for the

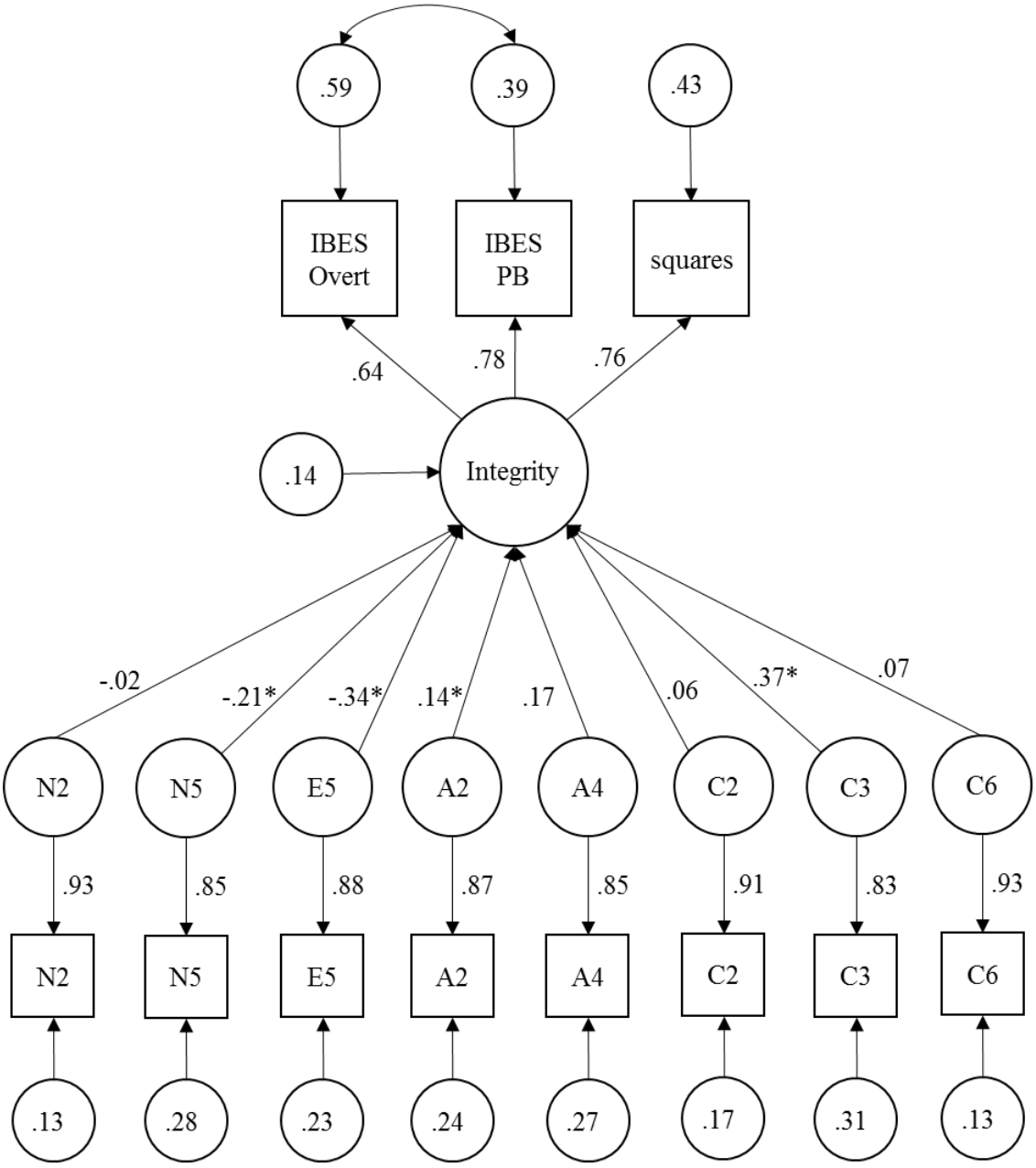
models testing the sixth conceptualization compared to the fifth conceptualization, but the amount of CWB variance explained (24% total) remained the same. Once again, models containing direct paths from the facets to CWB resulted in improper solutions for all alternatives of the sixth conceptualization.

Figure 8a. CFA for Conceptualization 5a (facets from Marcus et al., 2006)



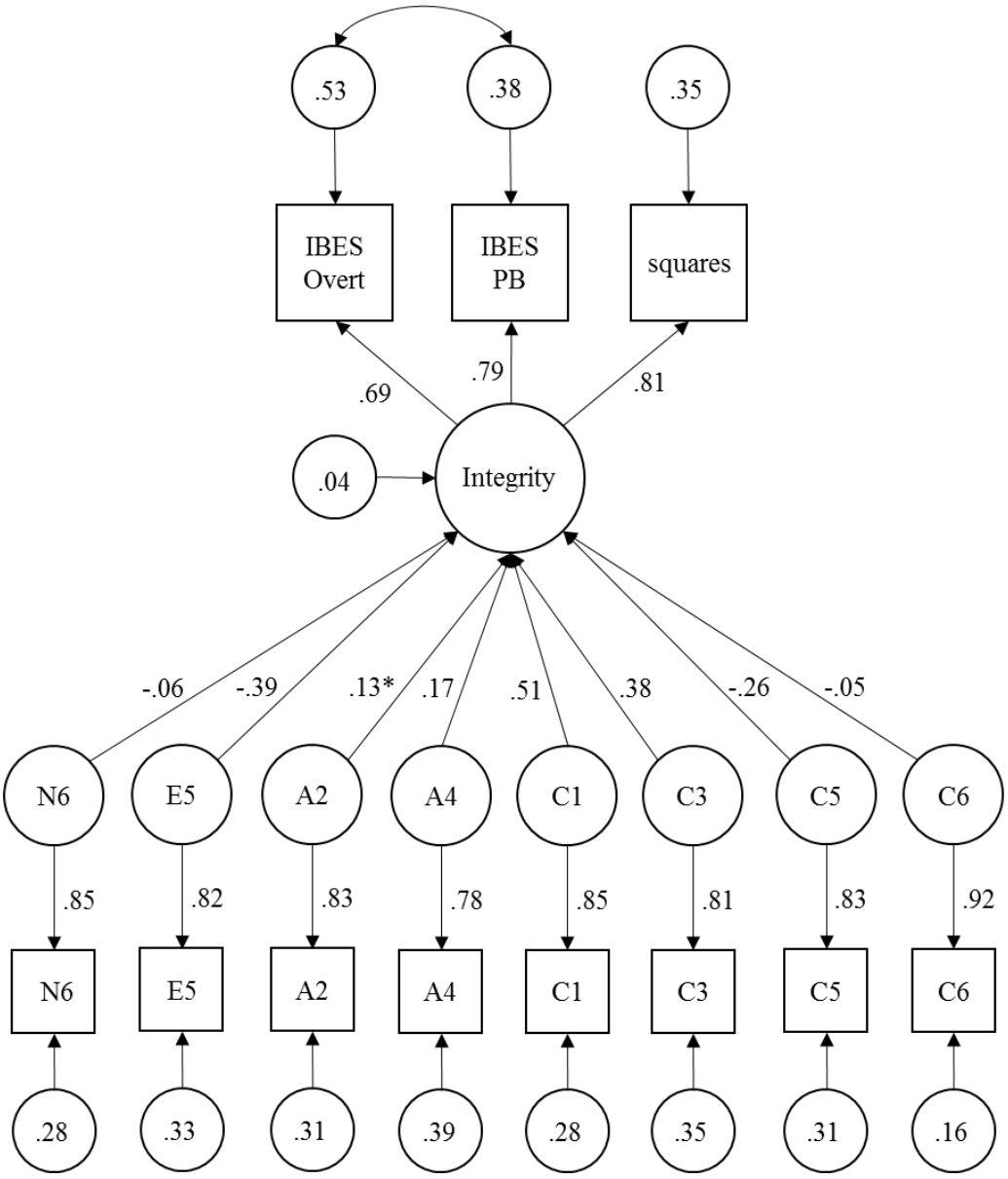
Note: latent personality traits are correlated; all factor loadings are significant at $p < .05$.

Figure 8b. CFA for Conceptualization 5b (facets from Costa & McCrae, 1995)



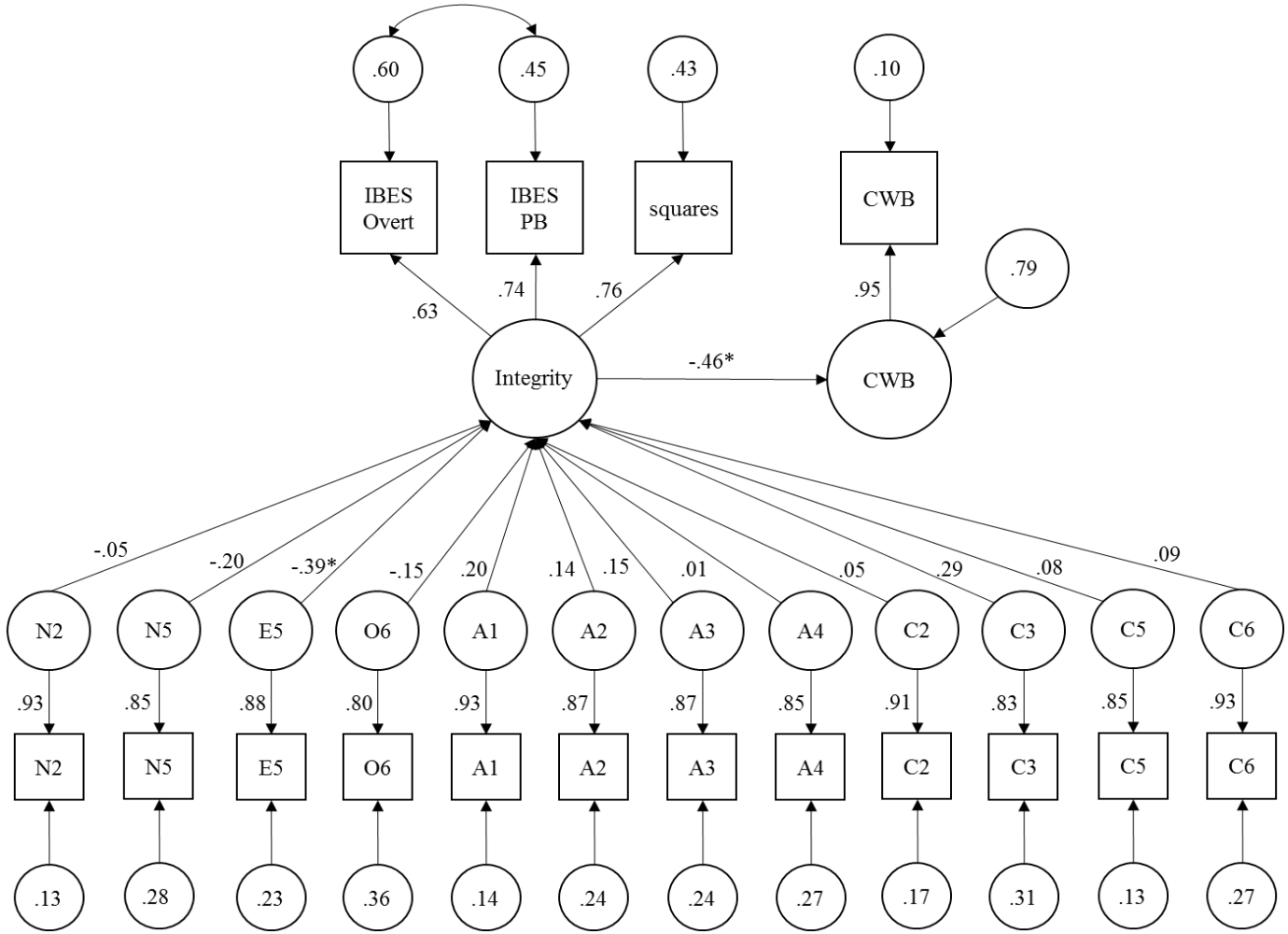
Note: latent personality traits are correlated; all factor loadings are significant at $p < .05$.

Figure 8c. CFA for Conceptualization 5c (facets from current study)



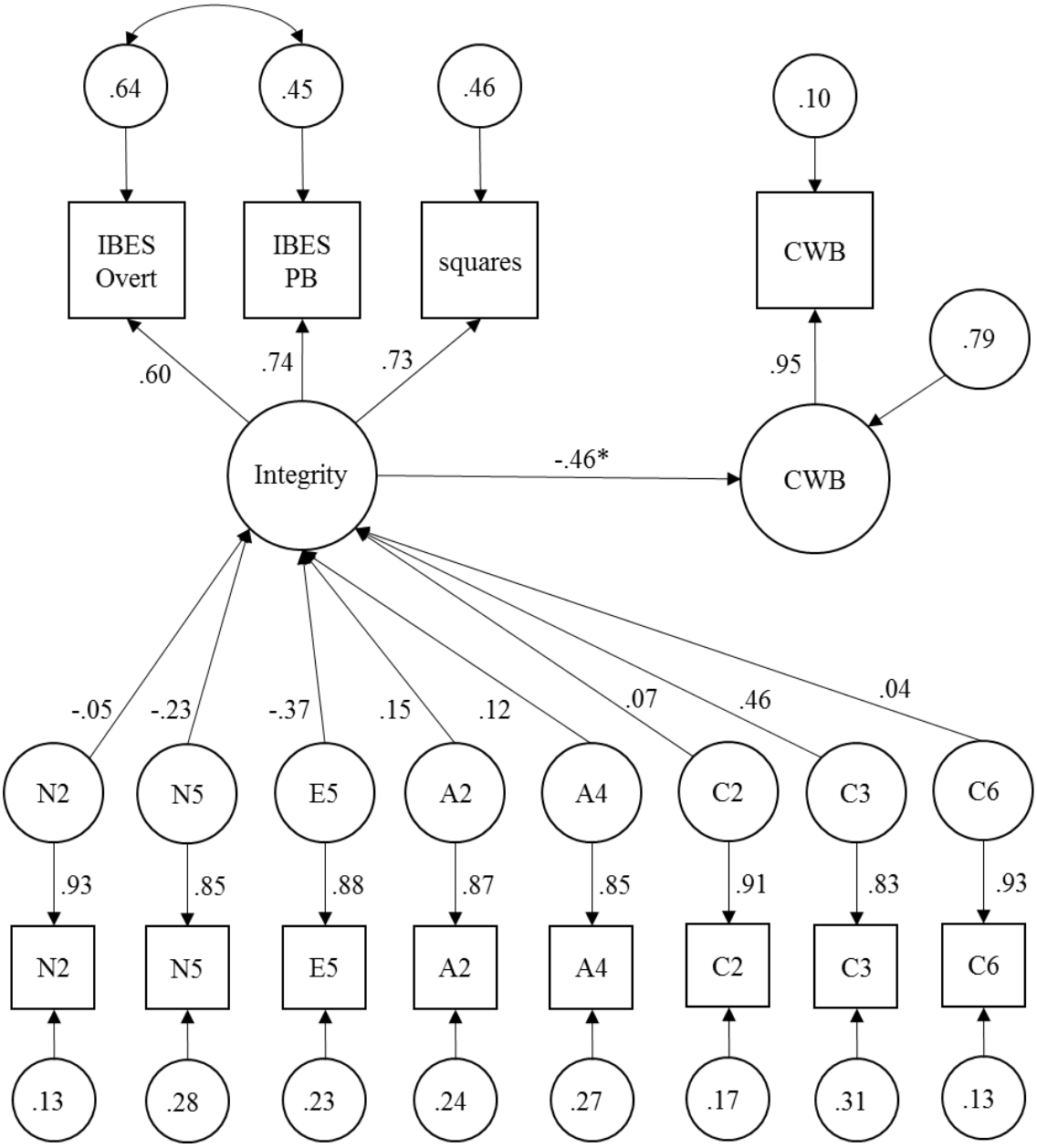
Note: latent personality traits are correlated; all factor loadings are significant at $p < .05$.

Figure 8d. Base Prediction Model for Conceptualization 5a (facets from Marcus et al., 2006)



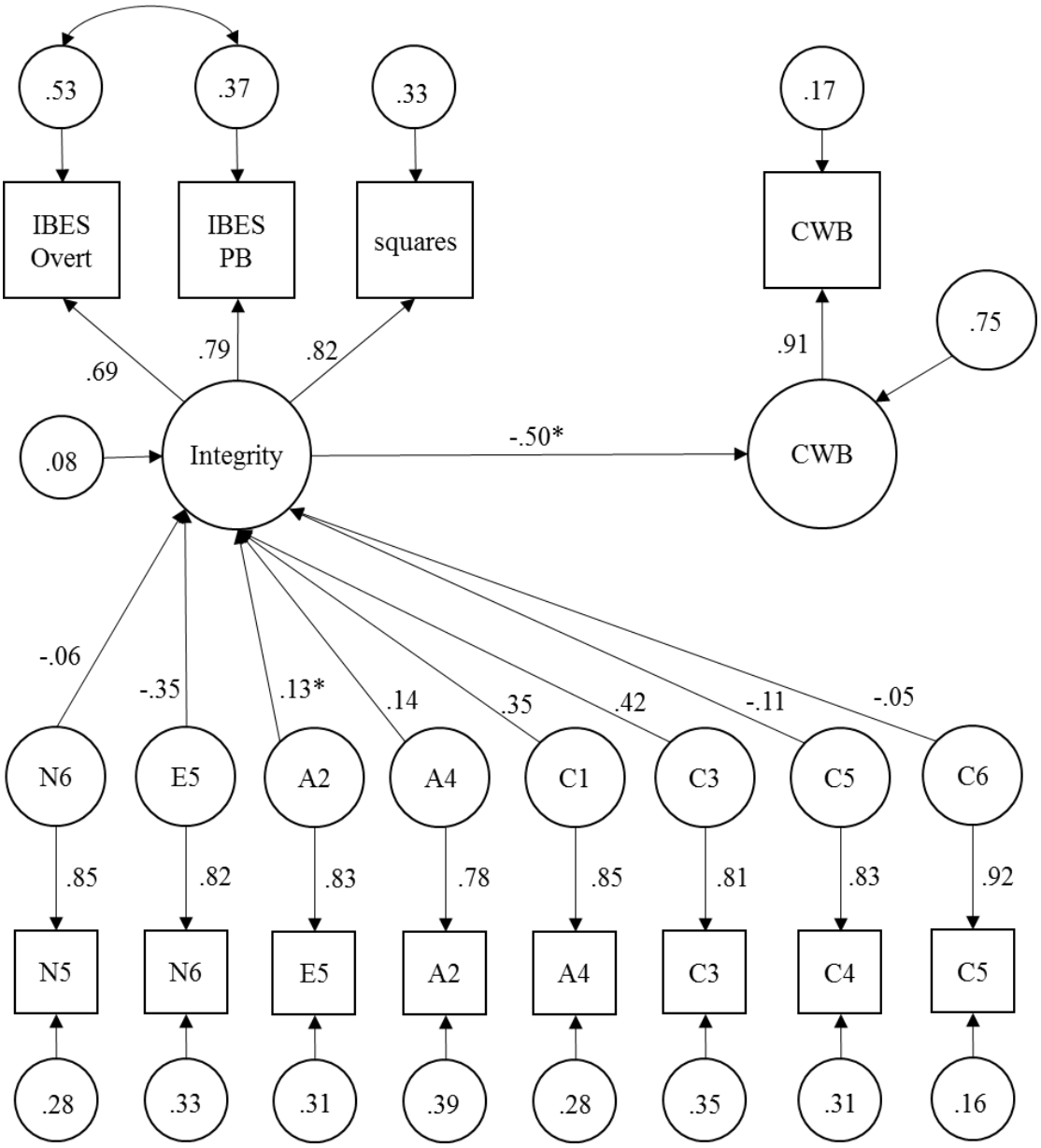
Note: latent personality traits are correlated; all factor loadings are significant at $p < .05$; * indicates $p < .05$.

Figure 8e. Base Prediction Model for Conceptualization 5b (facets from Costa & McCrae, 1995)



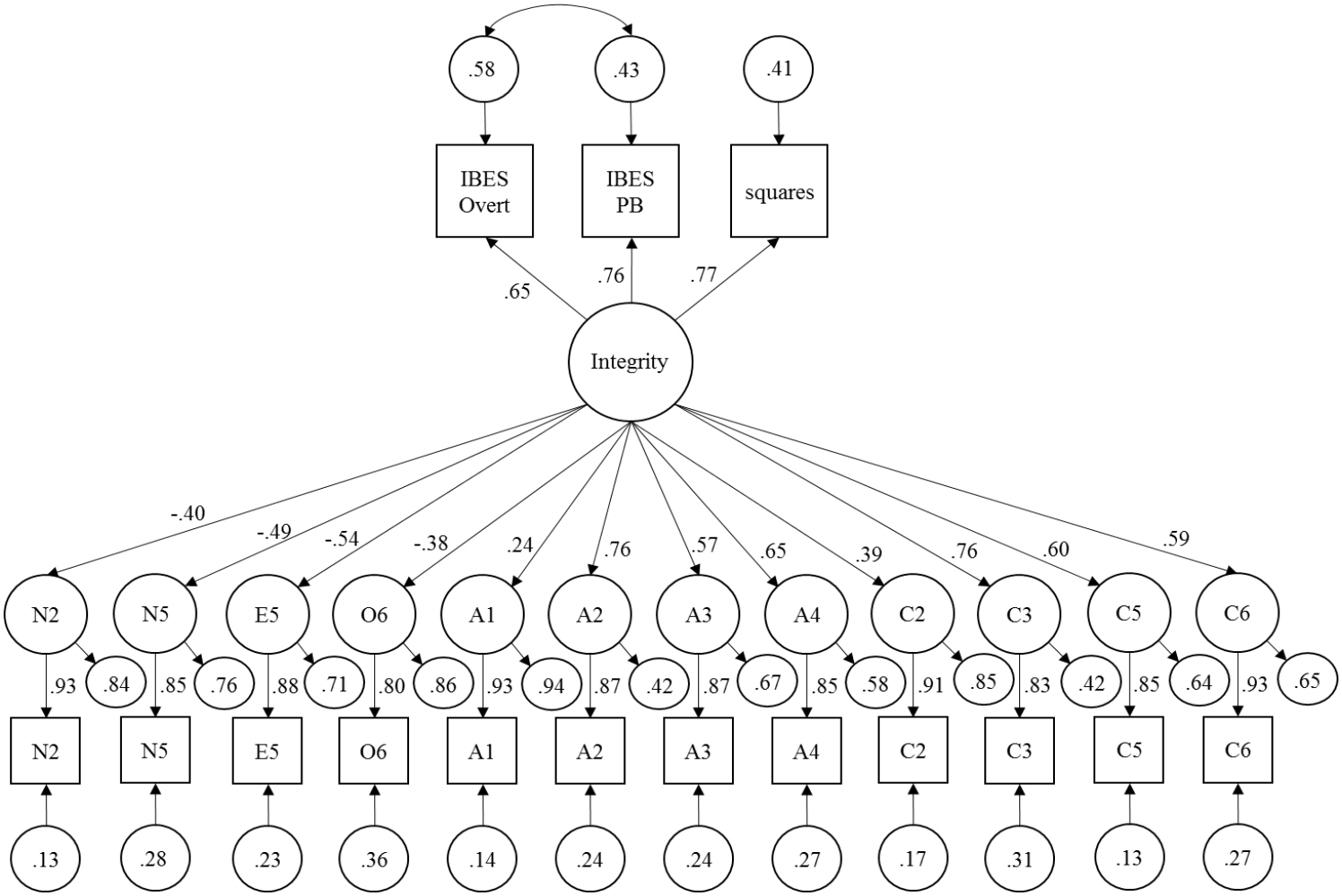
Note: latent personality traits are correlated; all factor loadings are significant at $p < .05$; * indicates $p < .05$.

Figure 8f. Base Prediction Model for Conceptualization 5c (facets from current study)



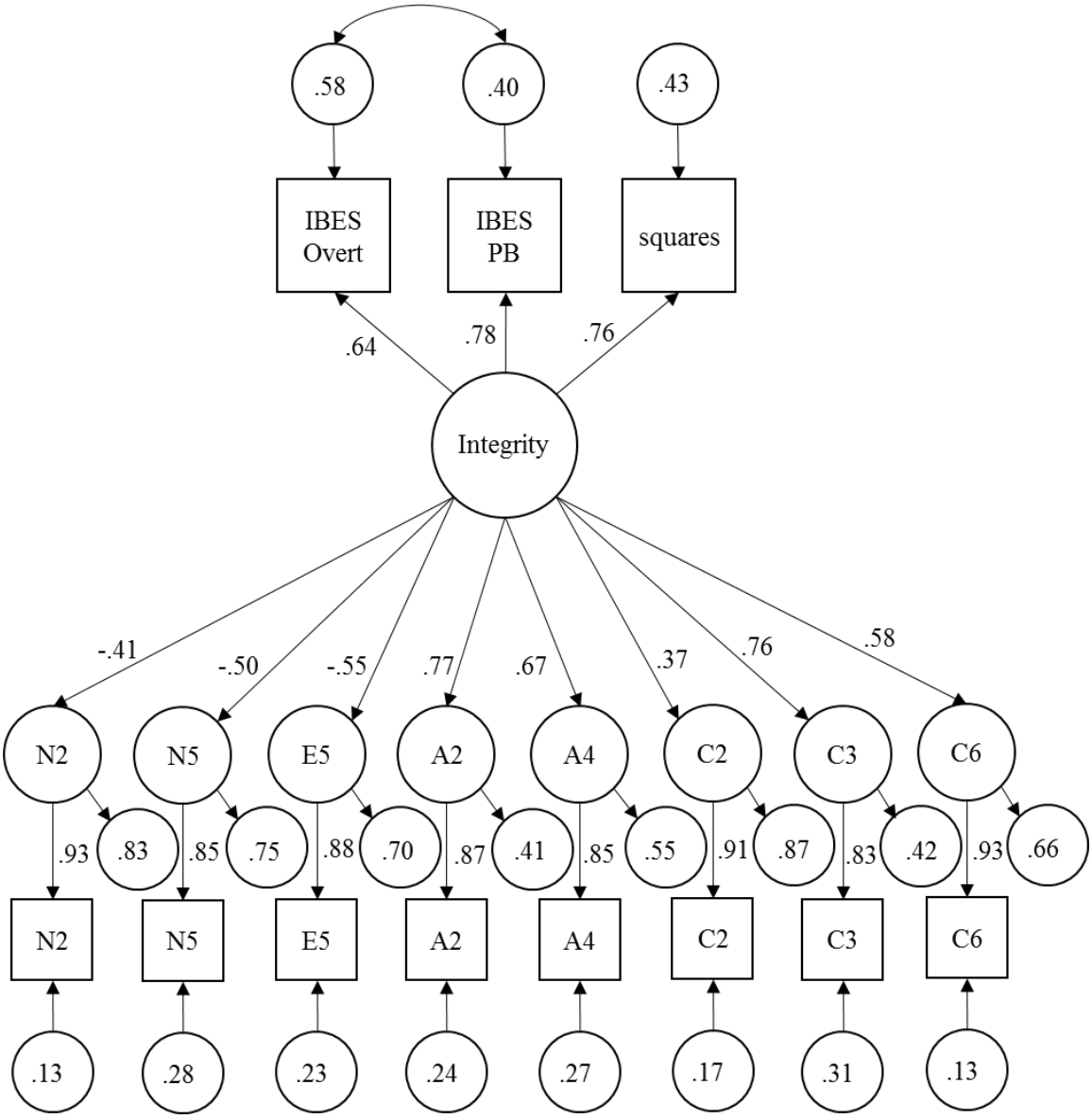
Note: latent personality traits are correlated; all factor loadings are significant at $p < .05$; * indicates $p < .05$.

Figure 9a. CFA for Conceptualization 6a (facets from Marcus et al., 2006)



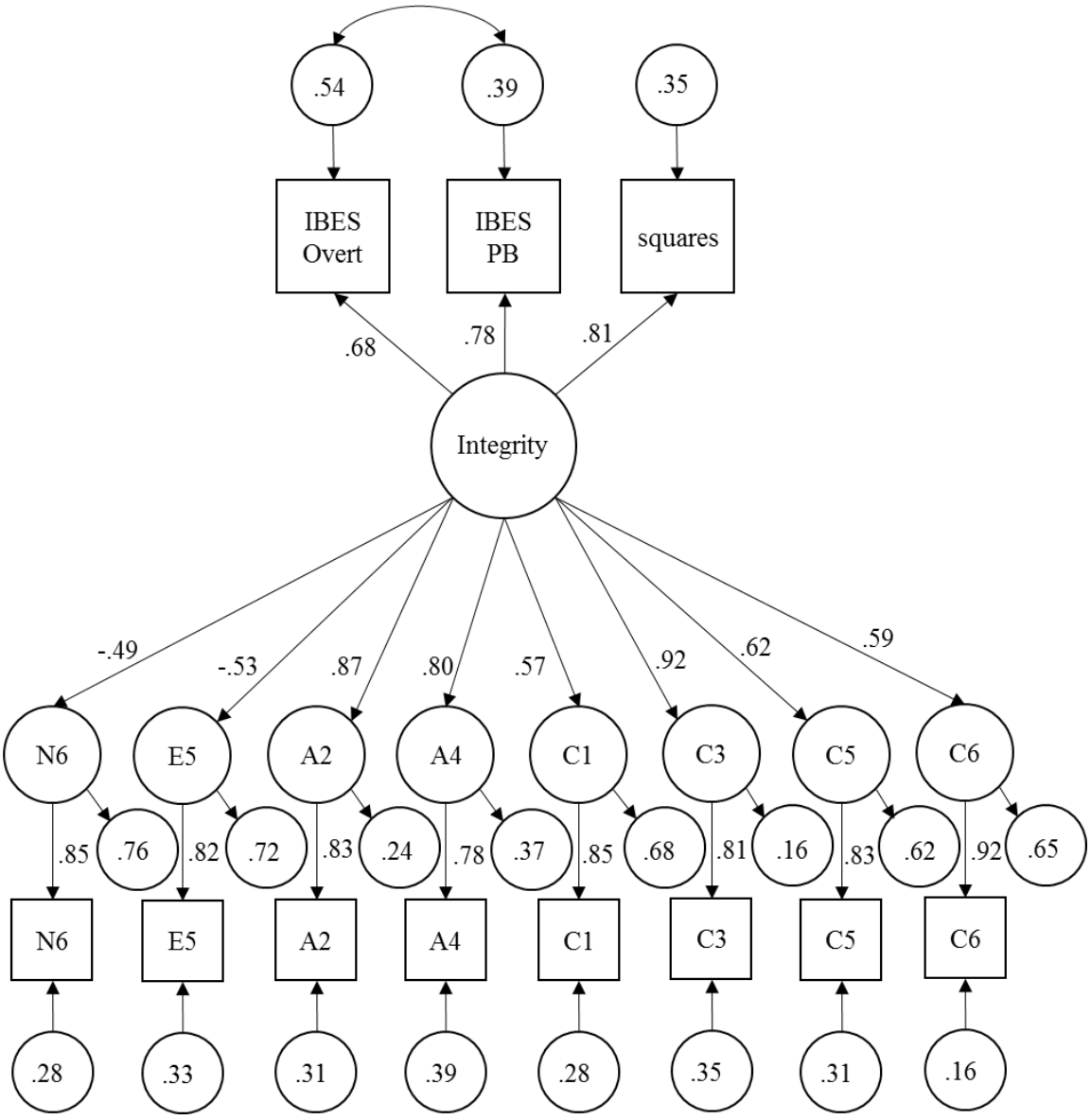
Note: error terms of latent personality traits are correlated; all factor loadings are significant at $p < .05$.

Figure 9b. CFA for Conceptualization 6b (facets from Costa & McCrae, 1995)



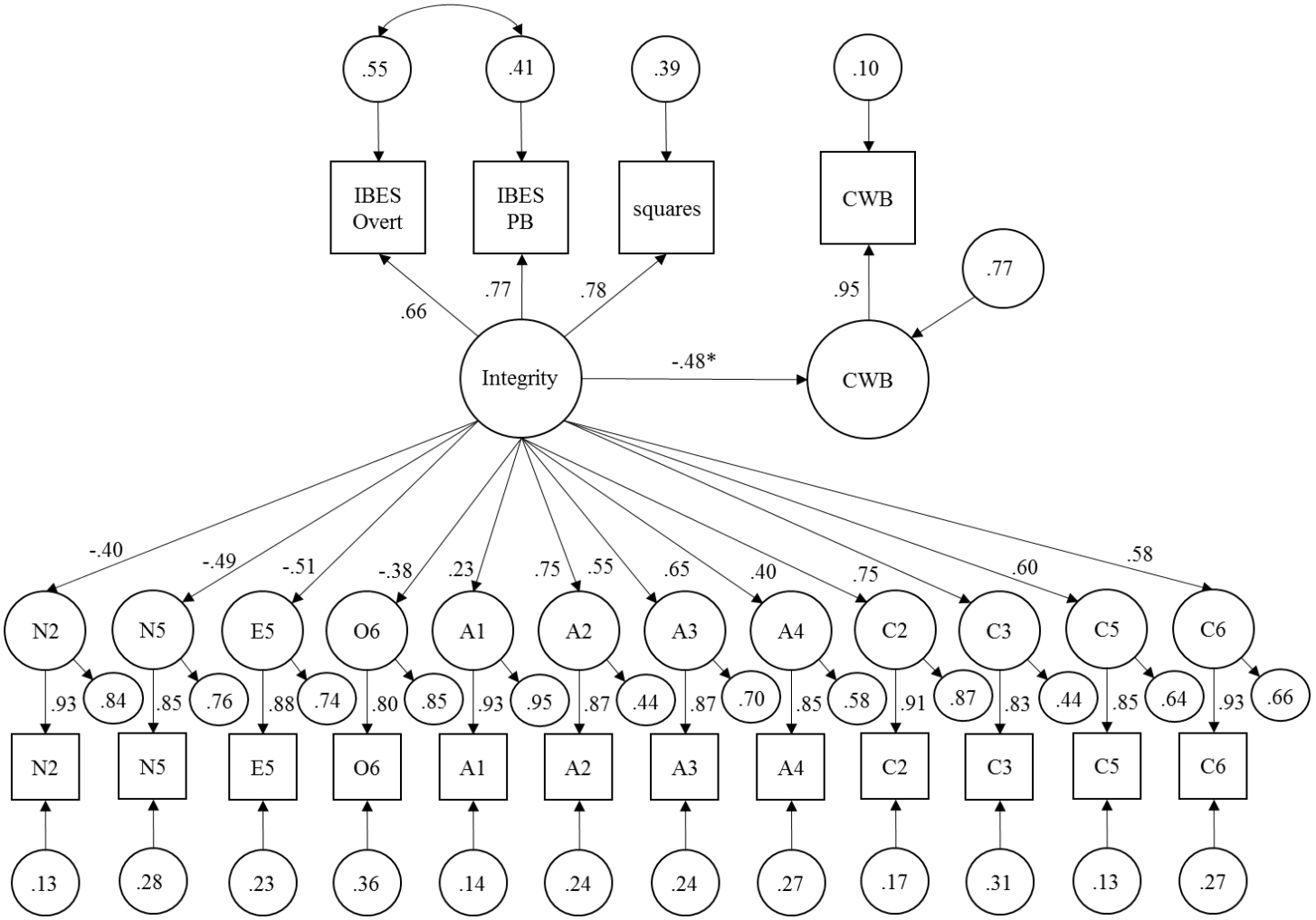
Note: error terms of latent personality traits are correlated; all factor loadings are significant at $p < .05$.

Figure 9c. CFA for Conceptualization 6c (facets from current study)



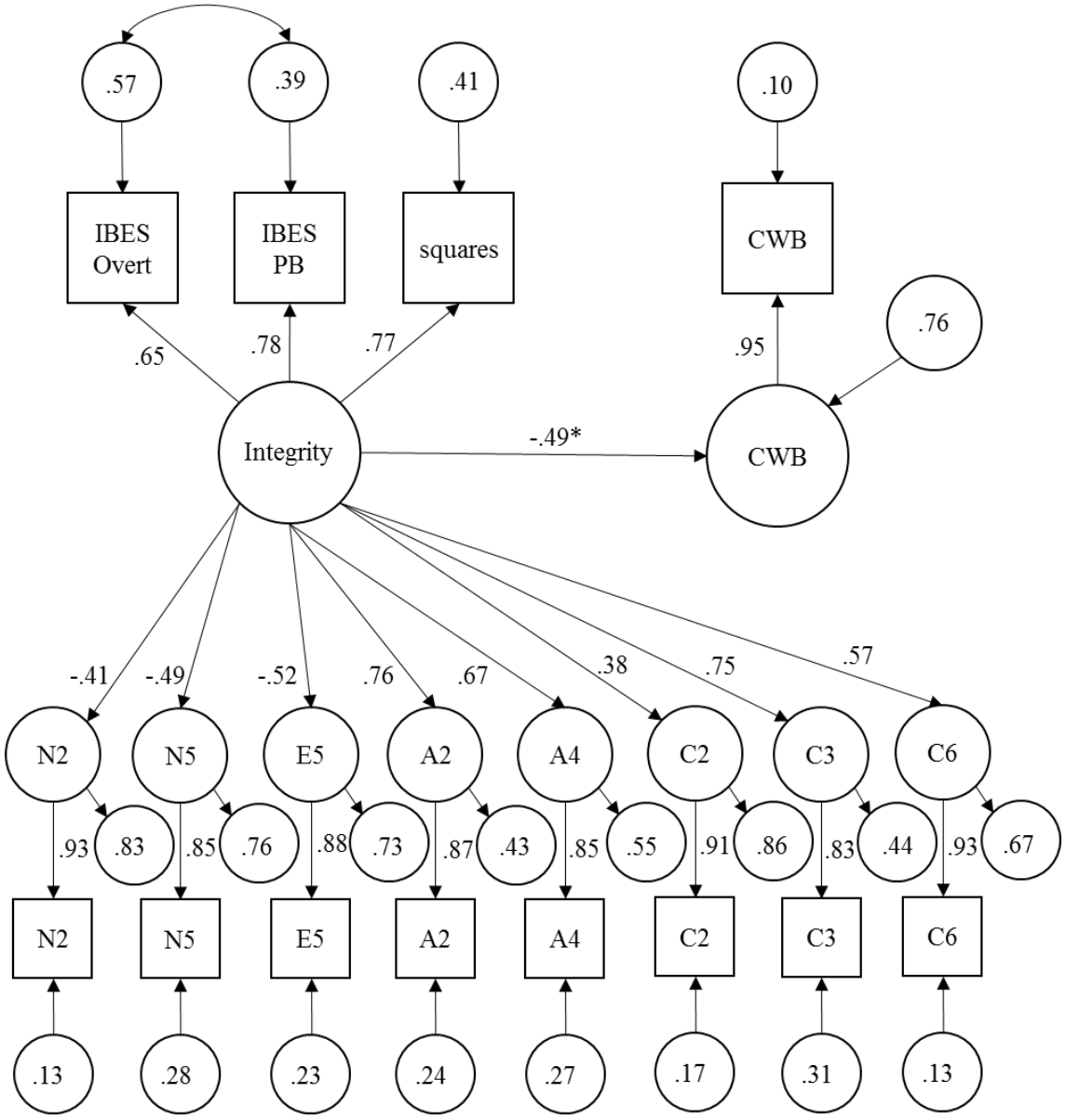
Note: error terms of latent personality traits are correlated; all factor loadings are significant at $p < .05$.

Figure 9d. Base Prediction Model for Conceptualization 6a (facets from Marcus et al., 2006)



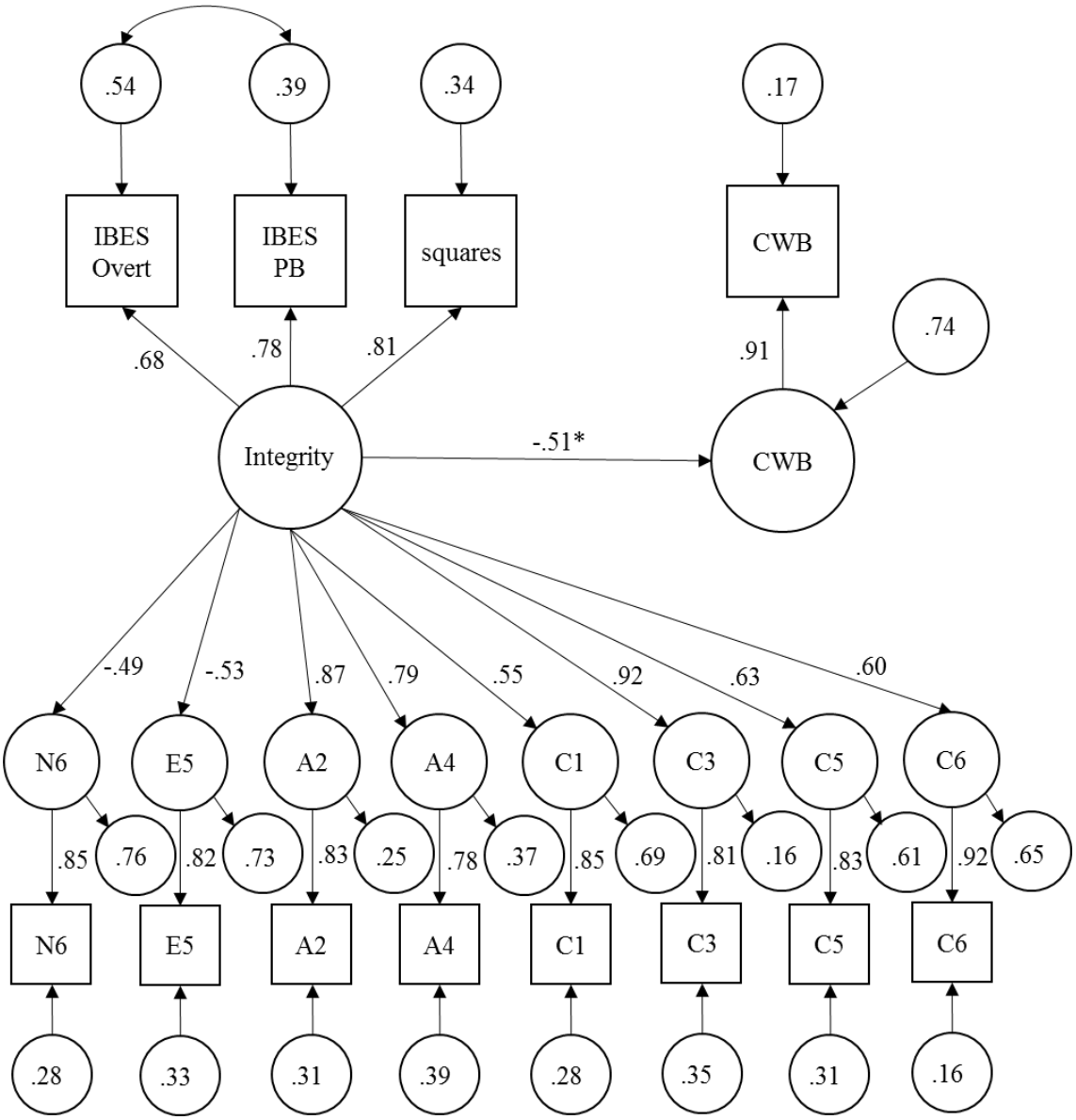
Note: error terms of latent personality traits are correlated; all factor loadings are significant at $p < .05$; * indicates $p < .05$.

Figure 9e. Base Prediction Model for Conceptualization 6b (facets from Costa & McCrae, 1995)



Note: error terms of latent personality traits are correlated; all factor loadings are significant at $p < .05$; * indicates $p < .05$.

Figure 9f. Base Prediction Model for Conceptualization 6c (facets from current study)



Note: error terms of latent personality traits are correlated; all factor loadings are significant at $p < .05$; * indicates $p < .05$.

CHAPTER V. DISCUSSION

The objective of the current study to investigate the underlying personality structure of integrity tests was partially fruitful, though many issues developed in the attempt to produce and compare the appropriate models for the different conceptualizations of the integrity test construct. As expected, high correlations were observed between all of the integrity tests, and subsequent analyses confirmed these strong relationships were due the various integrity tests tapping into a general integrity factor. This integrity factor was in fact a strong predictor of CWB, confirming that the integrity tests used in this study performed their intended function quite well.

Six different conceptualizations of integrity were defined and examined throughout the paper. Each of the six conceptualizations was accurate to some degree, but some performed better than others in terms of fitting the data and predicting CWB. Given that personality traits are designed to predict a wide variety of criteria—whereas integrity tests are designed solely to predict CWB—an integrity factor that includes traits is likely to be "diluted" (i.e., encompass several additional behavioral elements that are unrelated to CWB) to some extent. As a result, the overall fit of the model would be expected to worsen in general, while the predictive power of the integrity construct should be bolstered due to the additional behaviors being captured. That being said, the models that weakened the model fit and strengthened the predictive power of the integrity construct least were those including only Conscientiousness and those with Conscientiousness, Agreeableness, and Neuroticism.

Conscientiousness clearly plays a pivotal role in integrity tests, as demonstrated by the strong correlations between this trait and the integrity tests and the success of the

integrity model including Conscientiousness as an indicator. The role of Agreeableness and Neuroticism is less certain. Due to the pattern of moderate to strong correlations between these factors found in the currents study and prior research (e.g., van der Linden et al., 2010), it is tempting to conclude that the only variance Agreeableness and Neuroticism share with integrity tests is the variance they also share with Conscientiousness. However, examining the results of the formative model of integrity using these three factors—which essentially gives the relationship between each factor and integrity with the other two factors partialled out—may lead to a different conclusion. In this model, the partial relationship between Neuroticism and integrity (controlling for Conscientiousness and Agreeableness) was miniscule, whereas the partial correlation between Agreeableness and integrity (controlling for Conscientiousness and Neuroticism) remained significant and relatively large.

This indicates that, at the very least, integrity tests capture elements of both Conscientiousness and Agreeableness, and, similar to the conclusion of Murphy and Lee (1994b), integrity is "more than" just Conscientiousness. Previous research has shown that Conscientiousness is more predictive of organizational forms of CWB, whereas Agreeableness better predicts interpersonal forms of workplace deviance (Berry et al., 2007). Thus, it logically follows that a model predicting generalized CWB will be optimized when both Conscientiousness and Agreeableness are included. However, the results of this study suggest that Neuroticism may be redundant when Conscientiousness and Agreeableness are taken into account. Of these three traits, Neuroticism also has the lowest factor loading on integrity, which provides more evidence that it may not be as central to integrity as Conscientiousness and Agreeableness.

To explore this finding further, variance reduction rates (VRRs; Chen & Spector, 1991) were calculated for the pattern of relationships of Conscientiousness, Agreeableness, and Neuroticism with the integrity tests. The VRRs were calculated in three main steps. First, the proportion of variance shared between integrity tests and each personality factor was determined (as the squared zero-order correlation between them). Next, squared partial correlations were obtained for each personality factor; both first-order (e.g., Conscientiousness-Integrity minus Neuroticism) and second-order (e.g., Conscientiousness-Integrity minus Neuroticism and Agreeableness) were calculated to represent the proportion of variance in integrity being explained uniquely by each factor (9 partial correlations for each integrity test, 27 total). Finally, the difference between the squared correlations and squared partial correlations was divided by the squared correlations, giving the proportion of predicted variance in integrity that was "lost" for each personality factor when the other factors were partialled out (the VRR).

The VRRs (see Appendix) show that the variance in integrity tests explained by Neuroticism is reduced almost entirely (over 90%) when controlling for Conscientiousness and Agreeableness. On the other hand, the variance in integrity tests explained by Conscientiousness and Agreeableness separately is only moderately reduced (30-60%) when controlling for the other two factors. This may indicate that if the integrity test construct is indeed a superordinate factor, it would primarily subsume Conscientiousness and Agreeableness. Interestingly, the combination of these two traits as a metatrait has been proposed before as the Psychoticism factor in Eysenck's personality model (Eysenck, 1992, cf. Costa & McCrae, 1992b).

Similar to prior research (e.g., Costa & McCrae, 1995), differential correlations were in fact observed between personality facets and integrity tests (and CWB) in the current sample. The presence of these differential relationships may help explain the "diluting" of the integrity factor that occurred when personality traits were added: clearly, not all aspects of Conscientiousness and Agreeableness are related to integrity or CWB. Thus, Marcus and colleagues' (2006) suspicions that integrity tests may in fact be similar to a narrow trait test battery may have some merit. However, given that a broad CWB criterion was used in the current experiment, a more broadly defined integrity construct (i.e., one using traits at the factor rather than facet level) more appropriately matches the bandwidth of broad CWB. Therefore, it is possible that more broadly or narrowly defined traits would better predict more broadly or narrowly defined CWB. For instance, a "select facets" model may be superior to a "metatrait" model in predicting more specific CWB dimensions (e.g., Withdrawal), or Agreeableness and Conscientiousness would be superior to a metatrait or select facets model in predicting interpersonal CWB and organizational CWB, respectively. Appendix C presents an approximation of the "width" of these various constructs; matching the level of the constructs used may lead to more appropriate models and improved validity estimates.

The performance of the integrity model using Honesty-Humility as an indicator was surprisingly weak in comparison with models using other traits. This was quite unexpected, as Honesty-Humility has a correlation pattern with integrity tests and CWB and a factor loading comparable to that found with Conscientiousness. Based on the discrepancies between the CFA and SEM models, it appeared that while Honesty-Humility shared a large portion of variance with integrity tests, the part of Honesty-

Humility unrelated to integrity tests substantially altered the latent construct and thereby weakened its prediction of CWB. This shift in the latent construct was evident by the change in integrity test factor loadings. In models using the FFM traits, Squares had the largest factor loading, whereas in the model using Honesty-Humility, the IBES Overt scale had the largest loading. Given that Squares had a larger correlation with CWB than the IBES Overt scale, the corresponding change in validity of the latent integrity construct would be expected.

In general, the differences between the six conceptualizations makes it difficult to provide a direct comparison of them. Model 1 yielded excellent fit statistics and was a strong predictor of CWB. Although Model 2 also had excellent fit, it was the weakest predictor of CWB. Models 3 and 4 had similar fit statistics (Model 3 slightly better than Model 4) and prediction of CWB, but neither model explained more variance in CWB than a simpler model (i.e., Model 1). Models 5 and 6 had similar fit statistics as well (Model 6 slightly better than Model 5), but it appears using many facets actually predicts less variance in CWB than do a few larger factors. Moreover, including so many variables in the model was associated with statistical issues (e.g., improper solutions).

Based on the trends in the internal and external analysis summarized in the preceding paragraph, it would seem as though we need not look any further than Conscientiousness when examining where the integrity test construct fits into personality traits. However, our auxiliary analyses indicate that integrity is not entirely explained by Conscientiousness; at the very least, Agreeableness also explains a large portion of integrity independent of that explained by Conscientiousness.

The most glaring limitation in the current study was the inability to compare fully several of the conceptualizations, as some produced improper solutions. These improper solutions were almost certainly caused by multicollinearity among predictors. Fortunately, this only affects the estimates of individual parameters, not fit statistics (Cohen, Cohen, West, & Aiken, 2003), which allows for some comparison between models in terms of those that fit the data well (e.g., the reflective metatrait model) in contrast with those that did not (e.g., the Honesty-Humility SEM models).

Another limitation is the use of relatively few integrity tests (three total; only two independently-developed scales) compared to similar research (e.g., seven in Wanek, Sackett, & Ones, 2003). This limitation was in essence a result of integrity tests being largely commercial instruments. As of now, there is no clearly defined integrity test that is available freely to researchers. Thus, the integrity tests used in the current study were obtained only by request (IBES) or the personal connections of the author and generosity of cut-e (Squares). The fact that most commonly used integrity tests are not freely available to researchers greatly limits the potential for researchers to examine integrity.

The next step in refining the examination of personality, integrity tests, and CWB would be to determine if various breadths of traits are more effective predictors (through an integrity construct) when a criterion of matching breadth is used. For example, an integrity construct formed by integrity tests and Agreeableness might be a better predictor of interpersonal forms of CWB; an integrity construct formed by integrity tests and certain facets of Conscientiousness might be a better predictor of employee theft.

Finally, the results of this study should be replicated using more diverse measures and in a real selection context. Although the current study required participants to have

been employed for at least 6 months (i.e., was somewhat similar to a working sample), the sample was not a true applicant sample nor did the study attempt to replicate an application setting. The relationships found in this study would not be expected to vary greatly in a different context, but it is possible that a high-stakes testing situation would influence test-takers' willingness to respond honestly and openly to the integrity tests, CWB scale, and even some personality items if motivated to present themselves in a more positive manner (Griffith, Chmielowski, & Yoshita, 2007). In turn, applicant self-enhancement may have influenced the results of this study if it were conducted on real applicants going through an organizational selection system. Because of this potential, future research is necessary to confirm these findings in a real organizational setting using prospective employees.

The reliance of this study on self-report data—particularly for CWB—is certainly an issue. Although the potential problem of response distortion in integrity testing was briefly discussed earlier, overreliance on self-report measures has been cautioned for a variety of other reasons (e.g., Donaldson & Grant-Vallone, 2002; Spector, 1992). As future research investigates these conceptualizations of integrity, it is crucial that data are collected from multiple sources (e.g., organizational records, peer or supervisor ratings, etc.) or using advanced measuring techniques (e.g., ipsative scales) to combat potential response distortion.

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Appendices

Appendix A

FIU | FLORIDA INTERNATIONAL UNIVERSITY

Office of Research Integrity
Research Compliance, MARC 414

MEMORANDUM

To:	Dr. Chockalingam Viswesvaran
CC:	File
From:	Maria Melendez-Vargas, MIBA, IRB Coordinator
Date:	November 17, 2015
Protocol Title:	"Mapping Integrity Tests in the Domain of Trait Personality"

The Social and Behavioral Institutional Review Board of Florida International University has approved your study for the use of human subjects via the **Expedited Review** process. Your study was found to be in compliance with this institution's Federal Wide Assurance (00000060).

IRB Protocol Approval #:	IRB-15-0432	**IRB Approval Date:**	10/24/15
TOPAZ Reference #:	104021	**IRB Expiration Date:**	10/24/16

As a requirement of IRB Approval you are required to:

1) Submit an IRB Amendment Form for all proposed additions or changes in the procedures involving human subjects. All additions and changes must be reviewed and approved by the IRB prior to implementation.
2) Promptly submit an IRB Event Report Form for every serious or unusual or unanticipated adverse event, problems with the rights or welfare of the human subjects, and/or deviations from the approved protocol.
3) Utilize copies of the date stamped consent document(s) for obtaining consent from subjects (unless waived by the IRB). Signed consent documents must be retained for at least three years after the completion of the study.
4) **Receive annual review and re-approval of your study prior to your IRB expiration date**. Submit the IRB Renewal Form at least 30 days in advance of the study's expiration date.
5) Submit an IRB Project Completion Report Form when the study is finished or discontinued.

Special Conditions: N/A

For further information, you may visit the IRB website at http://research.fiu.edu/irb.

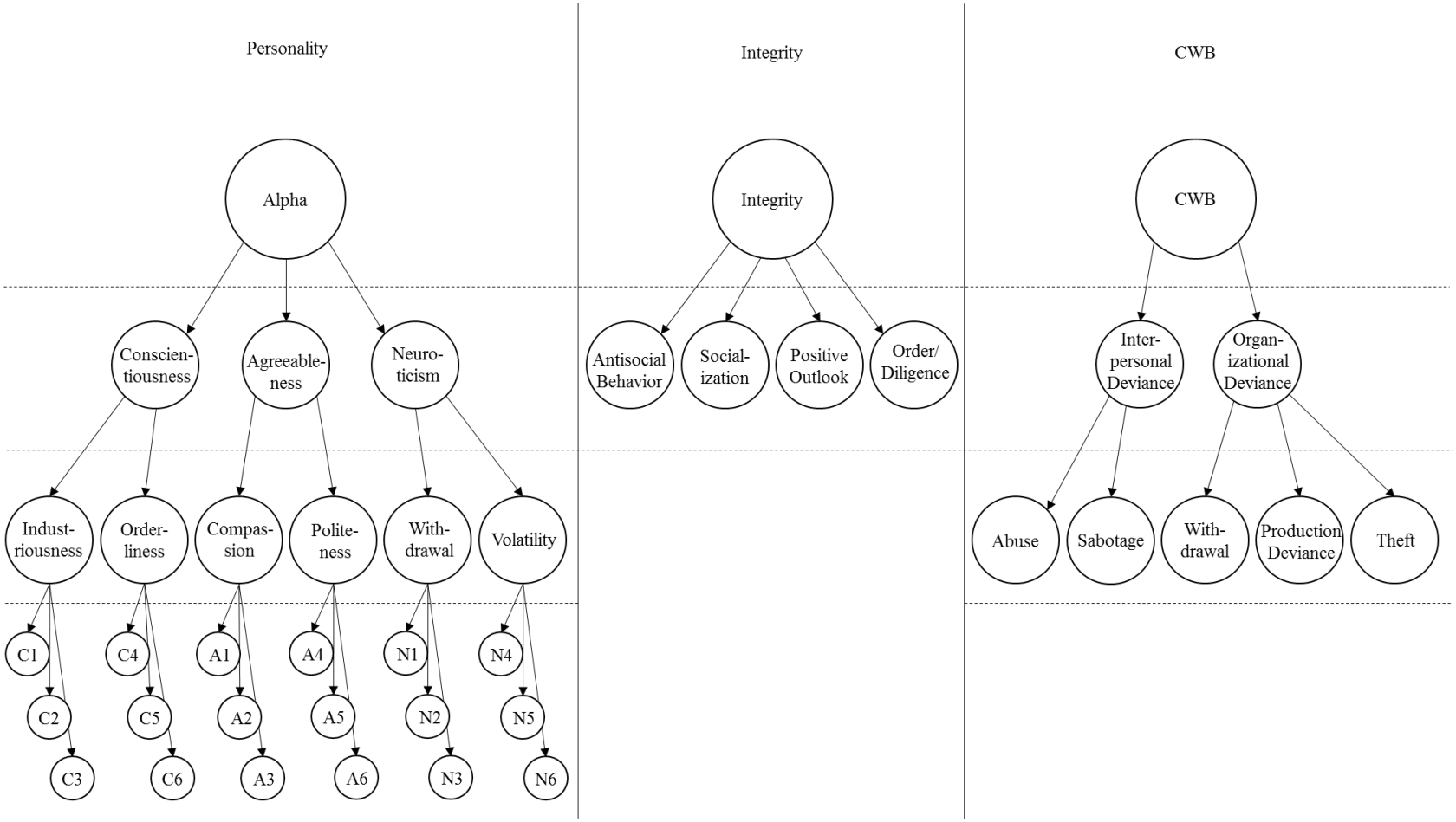
Appendix B

	r	r_{-A}	VRR	r_{-N}	VRR	r_{-AN}	VRR
Conscientiousness-IBESOvert	.44	.34	40%	.35	37%	.29	57%
Conscientiousness-IBESPB	.52	.44	28%	.42	35%	.37	49%
Conscientiousness-Squares	.62	.57	15%	.56	18%	.52	30%

	r	r_{-C}	VRR	r_{-N}	VRR	r_{-CN}	VRR
Agreeableness-IBESOvert	.44	.35	37%	.39	21%	.34	40%
Agreeableness-IBESPB	.50	.41	33%	.44	23%	.39	39%
Agreeableness-Squares	.46	.35	42%	.40	24%	.34	45%

	r	r_{-C}	VRR	r_{-A}	VRR	r_{-CA}	VRR
Neuroticism-IBESOvert	-.30	-.12	84%	-.20	56%	-.06	96%
Neuroticism-IBESPB	-.36	-.15	83%	-.26	48%	-.1	92%
Neuroticism-Squares	-.35	-.08	95%	-.26	45%	-.03	99%

Appendix C


Personality
Integrity
CWB
Alpha
Integrity
CWB
Conscien-tiousness
Agreeable-ness
Neuro-ticism
Antisocial Behavior
Social-ization
Positive Outlook
Order/ Diligence
Inter-personal Deviance
Organ-izational Deviance
Indust-riousness
Order-liness
Compas-sion
Polite-ness
With-drawal
Volatility
Abuse
Sabotage
With-drawal
Production Deviance
Theft
C1
C2
C3
C4
C5
C6
A1
A2
A3
A4
A5
A6
N1
N2
N3
N4
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