Development of a Personality-Based Measure of Integrity

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Abstract

The present study intended to develop a theoretically driven, personality-based measure of integrity based on previous research that found the strong relationship between a composite of conscientiousness, agreeableness, and emotional stability with integrity (Ones, Viswesvaran, & Schmitt, 1993). Ten items were drawn from an existing personality inventory (i.e., the Trait-self descriptive personality inventory; TSD-PI) used by the Canadian Forces (CF). Confirmatory factor analysis supported a stable three-factor structure for the scale with items corresponding to the three personality factors. The scale related to the Honesty-Humility scale of the HEXACO-PI (Lee & Ashton, 2004) and was unrelated to organizational commitment (Meyer & Allen, 1991). Hierarchical regression analyses provide evidence that the integrity scale predicts counterproductive work behaviour and job performance on the Basic Military Qualification course, over and above the 'Big 5' factors of the TSD-PI. Implications for use within the CF, study limitations, and direction for future research are discussed.

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Table of Contents

List of Appendices

List of Tables

List of Figures

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Development of a Personality-Based Measure of Integrity

Selection of dependable and honest employees who do not cause behavioural problems for the organization is a desire of any company. However, choosing employees that meet these criteria may be challenging. Integrity tests have been utilized by organizations and industrial/organizational psychologists for personnel selection purposes for over 25 years (Cullen & Sackett, 2004), with the stated intention of identifying applicants that are likely to exhibit behaviours that are counterproductive to the goals of the organization (Ones, Viswesvaran, & Schmitt, 1993). Organizational repercussions of selecting unreliable individuals can result in hundreds of thousands of dollars of lost resources in recruitment, selection, training, and benefits (Camara & Schneider, 1994).

Due to the nature of the industry, security focused organizations, such as the police or military, place added emphasis on ensuring that their employees can be relied upon to conduct their duties with integrity and honesty. Selection of counterproductive, dishonest, or unreliable individuals can have consequences that extend well beyond the bottom-line, even resulting in loss of life (Report of the Somalia Commission Inquiry). Therefore, selecting individuals who can be relied upon to perform their role and not create problems for the supervisory staff and colleagues is paramount. However, many organizations, including the Canadian Forces (CF), do not select their applicants based on a measure of integrity or reliability, leaving a noticeable gap in their selection process. Therefore, the current study seeks to address this gap by creating and validating a measure of integrity for use within the CF.

Integrity in the CF

Due to the extreme and sometimes perilous nature of the occupation, members of the CF are likely to find themselves in situations that require trust in their peers, supervisors, and subordinates that differs in degree of intensity from a typical corporate organization. To affirm the necessity of these characteristics, the CF has issued a *Statement of Defence Ethics* that outlines six core ethical principles that all members of the CF are obligated to follow: integrity, loyalty, courage, honesty, fairness, and responsibility ("Canadian Forces", n.d.). In peace or war time, a lack of trust stemming from a breach of one or more of these principles, or a person behaving in a manner that is counter to the objective of the group, can not only be detrimental to the success of the operation, it may also result in the loss of life. The consequences of hiring individuals who are not congruent with the values of the organization are high. Therefore, assessing CF applicants for aspects of these core principles is a prudent task.

Integrity defined

Sackett and Wanek (1997) defined integrity to include trustworthiness, dependability, conscientiousness, reliability, and honesty. Becker (2005) considered integrity to be the tendency for a person to comply with social norms, be truthful, fair, and avoid deviant behaviour. Becker (1998) also differentiated between integrity and two associated constructs (honesty and conscientiousness), in that as honesty is a "necessary but not sufficient condition for integrity" (p. 158). Integrity is related to conscientiousness, in that dependability is a narrow trait that underlies both integrity and conscientiousness; however, aspects of conscientiousness, such as carefulness and organization, are typically not subsumed in the content of integrity (Becker, 2005).

Although no particular definition of integrity is entirely agreed upon in the literature,

there is a general consensus that the construct contains several personality factors, such as

conscientiousness, reliability, and honesty. For the purposes of this study, the construct of

integrity is operationally defined as being honest, dependable, reliable, and conscientious.

Integrity tests have added to selection systems by improving on the predictive

ability of the system. For example, even though cognitive ability has consistently

displayed the highest validity in the prediction of employee job performance (Ree, Earles,

& Teachout, 1994), Ones and Viswesvaran (1998a) reported that integrity tests accounted

for 14% of the variance in job performance, after controlling for cognitive ability. Ones

and Viswesvaran (2007) showed that integrity improved the prediction of maximal

performance (i.e., an employee performing at their peak capacity) over job knowledge

($\Delta R^2 = .07$, $p < .05$). These studies illustrated that integrity tests have important

contributions to make to an organizational selection system.

Types of integrity tests

Sackett and Harris (1984) distinguished between two forms of integrity tests:

overt and personality-based. The overt test, as its name suggests, openly asks the

respondent to comment on their past work behaviour with the intent of determining if

they have previously acted contrary to the organization's values (Wanek, 1999). The

intent of personality-based tests is not necessarily obvious to the test-taker as items are

typically broader in focus (Catano & Prosser, 2007). Although these two tests apply

different approaches to measuring the integrity construct, the tests are correlated (Ones, et

al., 1993). Using multiple tests from each format, Sackett and Wanek (1996) reported a

disattenuated correlation between the two types of tests of .39, indicating a moderate relationship between overt and personality-based tests.

Overt integrity tests. Overt, or clear-purpose integrity tests, are designed to directly measure attitudes and the respondent's previous actions regarding theft and other deviant behaviours (Wanek 1999). Prevalent examples of these tests include the London House Personnel Selection Inventory (PSI), the Stanton Survey, and the Reid Report (Catano & Prosser, 2007). Overt integrity tests are typically administered in two sections; the first section asks about attitude and perceptions regarding dishonest behaviour, whereas the second will seek information regarding the individual's past behaviour surrounding theft and other forms of counterproductive behaviours. Catano and Prosser (2007) offered two critical assumptions that underlie overt integrity tests. First, test-takers must answer truthfully, which can be viewed as somewhat of a paradox considering the nature of the test. A dishonest person may answer the questions in a manner that they feel will solicit their desired outcome (usually this outcome is to gain employment). Conversely, an honest person may admit to the most minor of offences (e.g., took a pencil from work without permission); in these instances, an overt test could potentially screen out the honest candidate and select the dishonest candidate. The second underlying assumption of overt integrity tests is that past behaviour predicts future behaviour. Past and future behaviour tends to be modestly correlated (r=.39; Ouellette & Wood, 1998). Therefore, in order to base a selection decision on an overt integrity test a human resources manager must trust that the applicant is telling the truth and that they are likely to behave in a similar manner in the future.

Personality-based integrity tests. The intent of personality-based integrity tests, also known as covert or disguised-purpose tests, is to assess an applicant's propensity to be counterproductive to the organization on a broader scale (Catano & Prosser, 2007; Wanek, 1999). The overt test strives to pinpoint specific deviant behaviours, such as theft; whereas the personality-based test is typically seeking to assess deviant behaviour in a general context (Horn, Nelson, & Brannick, 2004). Examples of personality-based integrity tests include the Hogan Reliability Scale and the Personnel Reaction Blank (Catano & Prosser, 2007). These tests are typically composed of broad and narrow personality traits and use a traditional personality inventory to deliver the integrity items. Typical questions found in a personality-based integrity test include "I am more sensible than adventurous" or "My home life was always happy" (Wanek, 1999).

The underlying rationale for using a personality-based format is twofold. First, the disguised-purpose test does not present the same paradoxical issue as an overt test as its intent is typically unknown and, therefore, less susceptible to socially desirable responses (Alliger & Dwight, 2000; Catano & Prosser, 2007). Second, Ones et al. (1993) recognized that the construct of integrity was closely related to three of the 'Big Five' personality factors: conscientiousness, agreeableness, and emotional stability. It is these three factors that form the theoretical basis for many of the personality-based integrity tests (Wanek, Sackett, & Ones, 2003). Ones et al. (1993) found significant correlations between integrity and conscientiousness ($r = .45$), agreeableness ($r = .44$), and emotional stability ($r=.37$). The use of personality items as a measure of integrity is empirically supported by several researchers (Berry, Ones, & Sackett, 2007; Marcus, Hoft, &

Riedeger, 2006; Ones et al., 1993; Wanek et al., 2003). Goldberg (1993) argued that it is

these three factors from the FFM that are most closely related to the employment domain,

so it is not surprising that they comprise a trait that predicts work related outcomes.

Although Cullen and Sackett (2004) indicated that there is no consensus regarding

which form of integrity test, overt or personality-based, is considered to be a better

predictor of general counterproductive work behaviours (CWB). However, in a

predictive validation study, Ones et al. (2003) found that personality-based integrity tests

were much better predictors of absenteeism ($r=.33$) than were the overt measure ($r=.09$).

This finding provides a critical distinction between the two types of tests as it supports the

use of personality-based tests over overt tests to predict a narrow facet of CWB, other

than theft (Boye & Wasserman, 1996).

Integrity and personality

Wanek et al. (2003) conducted a study intended to shed light on the

misunderstood areas of integrity tests and attempt to better define the integrity domain.

Wanek et al. created 23 thematic composites based on the items of seven integrity tests

(three overt and four personality-based) and their results provided several remarkable

findings. They identified five themes that underlie all seven tests: "theft

thoughts/temptations, perception of dishonest norms, social/conformity, association with

delinquents, and theft admission" (p. 892). Most relevant to the present study, Wanek et

al. added support to previous findings (Hogan & Brinkmayer, 1997; Ones, 1993) that

integrity, in its thematic forms, is strongly correlated with conscientiousness,

agreeableness, and emotional stability.

In another examination of integrity's relationship with broad personality factors, Lee and Ashton (2004) outlined the incremental validity of a six-factor model of personality, known as the HEXACO personality inventory (i.e., HEXACO: Honesty-Humility, Emotionality, Extraversion, Agreeableness, Conscientiousness, and Openness to Experience) over the five-factor model (i.e., less Honesty-Humility). Honesty-Humility correlated with the Employee Integrity Index, an overt integrity test, suggesting that the moral conscience component of an overt integrity test is associated with the Honesty-Humility construct. Although the focus of this particular study was not personality-based integrity testing, Lee and Ashton purported that their findings also have relevant implications for these tests because they assess several of the narrow facets of Honesty-Humility (e.g., fairness, sincerity), in addition to several other facets (e.g., self-control, dependability, and reliability).

Lee, Ashton, and de Vries (2005) conducted a study that generalized across three countries (Canada, Australia, and the Netherlands) to show the incremental validity of the sixth factor: Honesty-Humility. Specifically, they compared the HEXACO with the FFM as a predictor of workplace deviance and overt integrity tests. Lee, Ashton and de Vries found that the HEXACO predicted both the overt integrity test and workplace delinquency better than the FFM (as measured by the NEO-PI-R). Lee et al. noted that the Honesty-Humility scale, although shown to be highly correlated with an overt integrity test ($r = .61$), was developed independently of the construct of integrity. However, it did cover the integrity domain sufficiently.

Catano and Prosser (2007) argued that perhaps the most widely used measure of integrity in selection is the Hogan Reliability Scale (Hogan & Hogan, 1995). The Reliability scale is a sub-scale of the Hogan Personality Inventory (HPI; Hogan & Hogan, 1995), which is a six-factor variant of the FFM (Nolan, Johnson, & Pincus, 1994). The Reliability scale is intended to assess honesty, dependability, and responsiveness to supervision. It demonstrates good internal consistency (α=.75) and test-re-test reliability (r=.83, over a four-week period); also, it correlates well with other known integrity scales and has shown strong criterion-related validity of r =.45 predicting CWB (Hogan & Hogan, 1995). These factors support its use in employee selection (Catano & Prosser, 2006). Additionally, the items of the Hogan Reliability Scale ensure that the scale does not create adverse impact toward any group (Axford, 1998).

In order to explain the relationship between conscientiousness and integrity, Murphy and Lee (1994) argued that the items in conscientiousness measures are similar to those in a personality-based integrity test. Second, descriptions of people who are both conscientious and exhibit high levels of integrity are very similar (e.g., dependable, meticulous). Ones et al. (1993) reported corrected correlations between the conscientiousness at .39 for overt tests and .45 for personality-based tests. Finally, the correlation between the two constructs was higher than correlations between integrity and the remaining four factors of personality (Marcus et al., 2006; Murphy & Lee, 1994). Murphy and Lee's study hypothesized that, due to the reasons listed above, conscientiousness was the likely link to explain the reason that integrity is a predictor of job performance.

The relationship between integrity and conscientiousness gives rise to an important issue surrounding integrity tests; is the construct of integrity simply conscientiousness, with parts of agreeableness and emotional stability? That is, do these factors explain the relationship between integrity and its two main criteria: job performance and CWB? Ones (1993) investigated the relationship between integrity and the Big Five Factors. She found that, after regressing integrity onto the FFM, the predictive validity of job performance increased the multiple R from .22 to .46. Her work demonstrated that integrity adds distinct variance to the job performance domain.

Murphy and Lee (1994) found that partialling conscientiousness out of integrity has a small effect on validity of the integrity construct. However, when the variance associated with integrity is removed from conscientiousness, the criterion-related validity is almost zero. In other words, although integrity is highly correlated with conscientiousness, it is considered a distinct construct as it produces incremental predictive ability of delinquent behaviour in the workplace over that of conscientiousness.

Criterion-related validity of integrity tests

Integrity tests have typically been used as a means of predicting behaviours in individuals that are detrimental to the effectiveness of an organization, or counterproductive workplace behaviours (CWBs). These behaviours include stealing, lying, cheating, absenteeism, fraud, aggression, and various forms of abuse. Past attempts to compare the criterion-related validity of integrity tests resulted in inconclusive results, mostly due to the inconsistencies with the criterion measure (Cullen & Sackett, 2004). Additionally, accurate self-report measures of CWB can be difficult to attain due to the

nature of the questions that ask the respondent to admit if they have committed acts that were counter to the organizations rules and/or societal laws.

Marcus and Schuler (2004) noted that CWB research has concluded that the majority of these behaviours are highly correlated with one another. In their study, they attempted to define the antecedents of CWB; Marcus and Schuler used a broad measure of CWB (i.e., General Counterproductive Workplace Behaviours, GCWB) based on the notion that the behaviours are strongly correlated with one another. They found that the principal and consistent antecedent for CWB is self-control, which is defined as the "tendency to consider the long-term consequences of one's behaviour" (p. 649). Their results indicated that self-control is the most important factor when considering the content variance of the GCWB construct. Therefore, given the predictive power of integrity testing with CWB, it is not surprising that a form of self-control or self-discipline is considered in the predictor's content.

As previously mentioned, Ones et al. (2003) found that personality-based tests were better predictors of absenteeism than overt tests. Ones et al. posited that the difference in prediction may stem from the notion that personality-based tests are better at capturing the volitional aspects of absenteeism than the overt tests. Also, personality-based integrity tests are intended to assess one's propensity to engage in untrustworthy and deviant behaviours, whereas the items of overt tests are typically intended to identify those likely to steal from the workplace based on admissions of past behaviour (Catano & Prosser, 2007). In their meta-analysis Berry, Ones, and Sackett (2007) indicated that CWB are most strongly (negatively) correlated with three personality factors:

conscientiousness, agreeableness, and emotional stability; this result provides further support for the use of a personality-based test of integrity that is explained, mostly, by these three sub-factors when predicting CWB. Additionally, these studies conclude that a personality-based measure is likely to be more effective when attempting to predict CWB as a broad construct in an employment setting.

Although integrity tests were originally designed to predict CWB in applicants and employees, researchers soon came to the conclusion that integrity tests were also capable of predicting another central workplace behaviour: job performance (Murphy, 2005; Murphy & Lee, 1994). A meta-analysis conducted by Ones et al. (1993) exhibited the presence of substantial criterion-related validity with integrity tests as they were shown to predict job performance with a coefficient of .34. Given that CWBs are negatively correlated with job performance, this relationship is logical (Rotundo & Sackett, 2002). The strong relationship between integrity and job performance, and the negative relationship between integrity and CWB, presents a substantial contribution to the personnel selection research because CWB's practical implications for organizations is considerable.

The Trait Self-Descriptive (TSD) measure of personality

CF has recently implemented a measure of the FFM of personality: the Trait Self-Descriptive Personality Inventory (TSD-PI). The TSD-PI is intended to assess factors of an applicant's personality relative to the knowledge, skills, and abilities that are required to be successful as a new recruit in the CF. However, other than the slow, time consuming, and often biased background check, the CF does not have any tool in its

selection model that resembles a measure of integrity. The CF has a need for a selection

measure that corresponds with its highly valued statement of ethics. Therefore, the

development of a measure of integrity, based on the TSD-PI, for the CF that is capable of

predicting CWB and/or job performance is the objective of the present study.

As described by Darr (2009), the TSD-PI is a 75-item measure of the Five Factor

Model (FFM) of personality (i.e., Agreeableness, Conscientiousness, Extraversion,

Neuroticism, and Openness to Experience). The TSD-PI was adapted from the United

States Air Force Self Descriptive Inventory. Using a 7-point Likert scale, ranging from 1

– extremely uncharacteristic to 7 – extremely characteristic, participants rate the extent to

which the statement or adjective reflects themselves. The first 33 items of the measure

are one-word adjectives; the remaining items are statements. Using the NEO-PI-R as a

benchmark for the FFM, Darr reports that the five factors of the TSD-PI display

convergent validity with the FFM on a factor-by-factor basis. However, this factor-level

examination revealed that the TSD-PI might be a more suitable measure of narrow facets

of personality rather than a robust measure of the FFM. For example, the TSD-PI

construct of conscientiousness was found to measure mostly the narrow facets "efficient

and dependable" and "organized". However, these two facets converged strongly with

the NEO-PI-R facets of "dutifulness" and "self-discipline", which are aspects of

personality that are consistent with the construct of integrity[1].

Boyes (2005) evaluated the fit of the 75-item TSD-PI for the FFM by conducting

a confirmatory factor analysis (CFA). Meyers et al. (2006) suggest a two-classification

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[1] In order to maintain the security of the TSD-PI, the full edition is not included in this report.

scheme to assess the fit of the data: absolute fit and relative fit. Two common measures

of absolute fit are the root mean square residual (RMSR) and the root mean square error

of approximation (RMSEA). Absolute fit measures "indicate how well the proposed

interrelationships between the variables match the interrelationships between the actual

[RMSR] or observed [RMSEA] interrelationships (Meyers et al., 2006, p. 559). Meyers

et al. indicated that an RMSR and RMSEA score of .06 or lower represents good fit.

Relative fit statistics assess the model against the independence model that presents no

variable relationships; the model is compared to this base-line model and, therefore, a

statistic close to one (ideally, greater than .90) is preferred in order to indicate a departure

from the independent model. The comparative fit index (CFI) is a commonly reported

relative fit statistic.

Boyes (2006) found marginal to good results based on his results, RMSR=.09,

RMSEA= .05, CFI=.92. Boyes showed that the five factors of the TSD-PI exhibited

strong convergent validity with their respective factors on the NEO-Five Factor Inventory

(NEO-FFI; Neuroticism, $r = .85$; Extraversion, $r = .65$; Openness $r = .74$; Agreeableness,

$r = .55$; Conscientiousness, $r = .77$). Boyes' study provides some support that the TSD-PI

is, indeed, a sufficient measure of the FFM.

Hypotheses

To develop the TSD Integrity test, I proposed several hypotheses that, with

quantitative support, would contribute to the construct validity of the measure. A

confirmatory factor analysis (CFA) with three factors, conscientiousness, agreeableness,

and emotional stability, will demonstrate that the majority of the items of the Integrity

scale load together to form a global measure of integrity.

Hypothesis 1: The items identified from the TSD-PI will load onto one factor.

In order to exhibit construct validity, the Integrity scale must display certain

relationships with the other measures that will be used in this study. First, it should

resemble an existing measure of integrity, e.g., , the HEXACO Honesty-Humility scale

(Lee & Ashton, 2004). Lee, Ashton, and DeVries (2005) noted that the Honesty-

Humility is not intended as a direct measure of integrity, but is strongly correlated with

the Employee Integrity Index ($r = .40$) and that the content of the Honesty-Humility Scale

is similar to the desired content of the Integrity test.

Hypothesis 2: The TSD Integrity scale will be significantly and positively

correlated with the Honesty-Humility factor of the HEXACO Personality

Inventory.

To demonstrate discriminant validity, the TSD Integrity scale should prove to be

dissimilar from measures that are not theoretically linked to the construct of integrity.

The concept of organizational commitment investigates an employee's willingness to

remain with their employer (Meyer & Allen, 1991). This construct is theoretically distinct

from integrity; organizational commitment refers to one's motivation to remain with their

employer, which is driven by the emotional and tangible outcomes that the worker will

experience as a result of staying (or leaving) the organization. Integrity is considered to

be a facet of an individual's personality and its content is not expected to overlap with

organizational commitment.

Hypothesis 3: The TSD Integrity scale will be correlated more highly with the

Honesty-Humility scale than with the organizational commitment scale.

Given that the formation of the TSD Integrity scale is contingent upon the notion

that integrity is a composite of conscientiousness, agreeableness, and emotional stability

(Ones et al., 1993), the integrity scale should correlate more highly with these three

factors of the TSD-PI than with the remaining two factors of the FFM (i.e., openness and

extraversion).

Hypothesis 4:The TSD Integrity scale will be more highly correlated with the

conscientiousness, agreeableness, and emotional stability factors of the TSD-PI

than with the openness and extraversion factors.

Finally, to establish validity, the relationship between the Integrity scale and

CWBs and job performance will be assessed.

Hypothesis 5a: The TSD Integrity scale will be significantly and negatively

correlated with CWBs.

Hypothesis 5b: The TSD Integrity scale will be positively correlated with job

performance.

Phase 1: Item identification and scale refinement based TSD-PI

Method

Subject matter experts. Seven subject matter experts (SMEs) and the principal

researcher identified items from within the TSD-PI as possible candidates for the initial

version of the TSD Integrity test. The SMEs were graduate students in the field of

Industrial/Organizational Psychology (six women, one man). Four of the seven

participants had completed their Master's degree and were enrolled in the Ph.D. program

at Saint Mary's University (SMU); the other three were in their second year of the

Master's program at SMU. Participants' ages ranged from 24 to 28. Prior to

commencing this phase of the study, participants provided informed consent for their

involvement.

Item identification. The principal researcher initially reviewed all items from the

TSD-PI. By definition, the items of a personality-based integrity test are not intended to

be clear-purpose, which would make this task of identifying integrity items difficult for

an uninformed observer; therefore, the SMEs were provided the information needed to

identify the items that best resembled the construct of integrity. Specifically, the SMEs

were given the operational definition of integrity and the Honesty-Humility scale of the

HEXACO. Under the assumption that the SMEs were familiar with the personality-based

integrity test literature, the participants were not privy to the underlying Big 5 label

conscientiousness, agreeableness, and emotional stability items. Collectively, the

participants selected 22 items from the TSD-PI that they considered to be part of the

integrity domain (Table 1). Not entirely surprisingly, 21 of the 22 items selected were

from the conscientiousness, agreeableness, or emotional stability domains; the other item

was an openness item (Conscientiousness – 13; Agreeableness – 6; Emotional Stability –

Experience – 1). These 22 items formed the first iteration of the TSD Integrity scale.

Scale Refinement. The next step was to refine the scale based on recommendations from

Meyers et al. (2006). The objective of this step was to initially assess the stability and

dimensionality of 22-item model. Cronbach and Meehl (1955) noted that a measure

Table 1.

22-item scale

Item	Description
1.	Organized (C).
2.	Disorganized (C).
3.	I like to keep my belongings neat and organized (C).
4.	Neat (C).
5.	I always have a place for everything and everything in its place (C).
6.	Orderly (C).
7.	I try to set a schedule for accomplishing tasks and stick to it (C).
8.	If I start something I work until it is finished to my satisfaction (C).
9.	I am always generous when it comes to helping other (A).
10.	I always treat others with kindness (A).
11.	I like to help others when they are down on their luck (A).
12.	Helpful (A).
13.	Even if I don't like them, I always try to be considerate of others (A).
14.	I always try to do more than expected of me (C).
15.	Cheerful (A).
16.	Precise (C).
17.	Thorough (C).
18.	Responsible (C).
19.	Careful (C).
20	Philosophical (O).
21.	When I am under stress I often feel that I am about to breakdown (ES).
22.	Sometimes I feel discouraged and want to give up (ES).

Notes. Underlying personality factor displayed in parentheses. A – Agreeableness. C – Conscientiousness. ES – Emotional Stability. O – Openness.
for each of the items of the TSD-PI so that they were not biased towards 2; Openness to

with too few items may not reflect the content of the construct, but a parsimonious scale is preferred in order to minimize response bias and to keep the length of survey administration low. Additionally, in order to reflect Ones et al.'s (1993) theory that integrity, as a latent construct, is a composite of conscientiousness, agreeableness, and emotional stability a scale with a three-factor structure was targeted. Ones (1993) indicated that conscientiousness and agreeableness contributed the most variance to the construct of integrity and emotional stability played a lesser role, which was taken into consideration in the item retention decisions.

Participants. A sample of CF recruits ($N = 388$) from the Canadian Forces Leadership and Recruit School (CFLRS) in St-Jean-sur-Richelieu, Quebec, provided the data for scale refinement. All participants were Non-commissioned members (NCMs) conducting their 13-week Basic Military Qualification (BMQ) course, which is the indoctrinatory course after selection into the CF (also colloquially known as 'boot camp'). The dataset consisted of 319 men and 67 women, which is representative of the military demographic ("Women in the Canadian military", 2006). All respondents were fluent in English; however, 18% did not consider English to be their first language (10% French, 8% Other). The majority of participants were aged 18-22 (61%); Forty-seven percent of the respondents' highest level of education was a high school diploma; 38% of respondents had completed a college diploma; the remainder completed university degrees as a minimum level of education.

This sample was appropriate for validation of the present study as the sample contains individuals recently selected by the CF for employment in a variety of military

occupations; they have had minimal interaction with the organization and are, therefore,

relatively unbiased with respect to the military culture. This sample also completed the

Honesty-Humility scale, an organizational commitment scale, and a self-report measure

of CWB.

Procedure. In order to solicit participation in the survey, the CFLRS staff

scheduled separate administration times for eight platoons of approximately 50 recruits.

In total, 423 recruits were asked to participate in the study, resulting in a participation rate

of 92%. At no time were the recruits ordered or told by their staff that they were required

to complete the survey; the staff members were not present at any point during the

administration, which was conducted solely by the principal researcher. In addition to the

written statement within the informed consent form that the survey was voluntary

(Appendix B), this point was verbally emphasized to the recruits prior to commencing the

survey. They were encouraged to answer honestly; if they did not feel that they would

answer in this manner, they were told that they should not complete the survey. The

inventory was administered in a paper and pencil format and, upon completion, was

collected and viewed only by the principal researcher.

Measures. The recruits were administered the following measures in addition to

the TSD-PI, which was used for scale refinement while the other measures were used

later to assess the construct validity of the new integrity measure.

HEXACO Honesty-Humility scale (HEXACO-PI; Lee & Ashton, 2004).

Respondents used a 5-point agreement scale (ranging from 1=completely disagree to

5=completely agree) to indicate the extent to which they felt the statement was indicative

of their personality (e.g., "I would be tempted to buy stolen property if I were financially

tight"). The 16-item Honesty-Humility scale has a four-factor structure that includes

sincerity, fairness, greed-avoidance, and modesty. Each of the subscales have four items.

In the present study, Cronbach's alpha for each of the subscales were sincerity α =.49,

fairness α =.64, greed α =.75, and modesty α =.64. Item-total correlations ranged from r

=.22 to r =.56. This measure was used to assess the convergent validity of the integrity

test.

   Organizational Commitment. An adapted 18-item measure of Meyer and Allen's

(1991) three-component model of organizational commitment was included in the

inventory to establish discriminant validity. Respondents used a 5-point agreement scale

(ranging from 1=completely disagree to 5=completely agree) to indicate the extent to

which they agree with items pertaining to their commitment to the CF (e.g., "I would be

very happy to spend the rest of my career in the CF"). The organizational commitment

scale is a three-factor scale, with each factor contributing six items; its three underlying

factors are affective commitment, normative commitment, and continuance commitment.

Affective commitment is one's desire to remain with the organization because of his or

her positive emotional connection with the organization. Normative commitment refers

to one's willingness to stay with the organization because they feel an obligation to do so.

Finally, continuance commitment speaks to an employee's willingness to remain with the

company because of the possible tangible negative consequences of leaving (e.g., money;

Meyer & Allen, 1991). In the present study, Cronbach's alpha for each of the subscales:

affective commitment, α =.33; normative commitment, α =.66; and, continuance

commitment, α =.65. Item-total correlations ranged from r =.12 to r =.48.

Counterproductive Workplace Behaviours (CWB). CWB was assessed using a

self-report measure. Robinson and Bennett's (2000) unnamed measure of CWB was

modified by Stewart, Bing, Davison, Woehr and McIntyre (2009) to a 14-item measure

and was used to establish concurrent validity of the TSD Integrity scale. The modified

survey asks respondents to indicate how often they conducted a particular behaviour

"over the past year" at work. A 5-point frequency scale is used (responses ranging from

1=never to 5=daily) to indicate how often, in the past year, they had conducted the stated

behaviour (e.g., "Lost your temper while at work"). Stewart et al.'s scale generates a

three-factor structure. The first factor, production deviance, accounted for seven of the

fourteen items; production deviance relates to the work, or lack thereof, that an employee

performs. An example of this form of deviance would be wasting resources. The second

factor is property deviance, which refers to deviant acts intended to physically abuse the

organization, such as stealing; this factor contributed four items. The third factor

represents personal aggression, which is indicative of acts that inflict harm against others

in workplace; verbal abuse is considered a type of personal aggression (Stewart et al.,

2009). The third factor had three items. In order to achieve scores as close to the true

score as possible I guaranteed confidentiality to the participants in the informed consent

form (Appendix B) and verbally at the time of administration. In the present study,

Cronbach's alpha for property deviance was α =.32, production deviance was α =.72, and

personal aggression was α =.84. Item-total correlations ranged from r =.10 to r=.58.

Job Performance. Two measures were used to assess job performance. The first

consisted of pass/fail data for the participants on their BMQ course. The second measure

consisted of a composite numerical score comprised of 16 performance objectives that

recruits are required to accomplish in order to be successful on the course (e.g., military

knowledge, inspections, weapons handling). Raw scores of each of the tests on the 16

objectives were added to form an overall score that ranged from 65.00 to 947.41 (M =

731.42, SD = 184.80). Over half of the participants scored greater than 797. The lowest

score of a recruit who eventually passed the course was 565.77; of those who failed the

BMQ, the average score was M = 439.74 (SD = 211.54). Although there is no specific

pass/fail cut-off within the measure, there is clearly a distinction between 'doing well'

and 'doing poorly' on the course.

Results

Data cleaning and screening. Prior to conducting any analyses, I examined the

dataset for inconsistencies and assumptions. Assumptions inherent to linear and logistic

regression, exploratory and confirmatory factor analysis were assessed (Meyers, Gamst,

& Guarino, 2006). Correlations between study variables confirmed the absence of

multicollinearity. No univariate outliers were encountered (i.e., standardized values

greater than four standard deviations from the mean). No variables produced a Cook's

distance greater than one; therefore, I found no multivariate outliers. I plotted the

variables and they were linear. The sample size was sufficient to conduct the various

analyses (Meyers et al., 2006).

Three cases from were excluded from the analyses due to over 75% missing data. Numerous other cases had missing data on some of the items; however, missing data analysis was conducted using SPSS 17.0 and determined that no cases had greater than 5% missing data; therefore, no further adjustments were made to the data.

The emotional stability items were administered as neuroticism items (i.e., written in a negative direction) based on their typical appearance in the TSD-PI (Darr, 2009); however, once collected, these items, in both the primary and secondary datasets, were recoded to reflect the same positive direction as the remaining items of the survey.

Exploratory Factor Analysis. An initial exploratory factor analysis was conducted to assess the dimensionality of the 22-items. The sample size of the primary dataset ($N = 388$) was sufficient to conduct factor analysis (Meyers et al., 2006). In order to test hypothesis 1, examination of the solution was based on minimum eigenvalues, the scree plot, and interpretability (Bauer, Truxillo, Sanchez, Craig, Ferrara, & Campion, 2001).

Principal axis factoring (PAF) produced four factors had eigenvalues greater than one, accounting for a total of 56.18% of the variance explained. The scree plot was also consulted and indicated the presence of three factors (see Figure 1). After orthogonal rotation (Varimax), none of the items were cross-loaded; however, seven items did not load onto their underlying personality factor hindering the interpretability of the scale. Four items did not load greater than .40 on any factor. Table 2 summarizes the factor loadings of the 22-item scale.

Figure 1.

Scree Plot
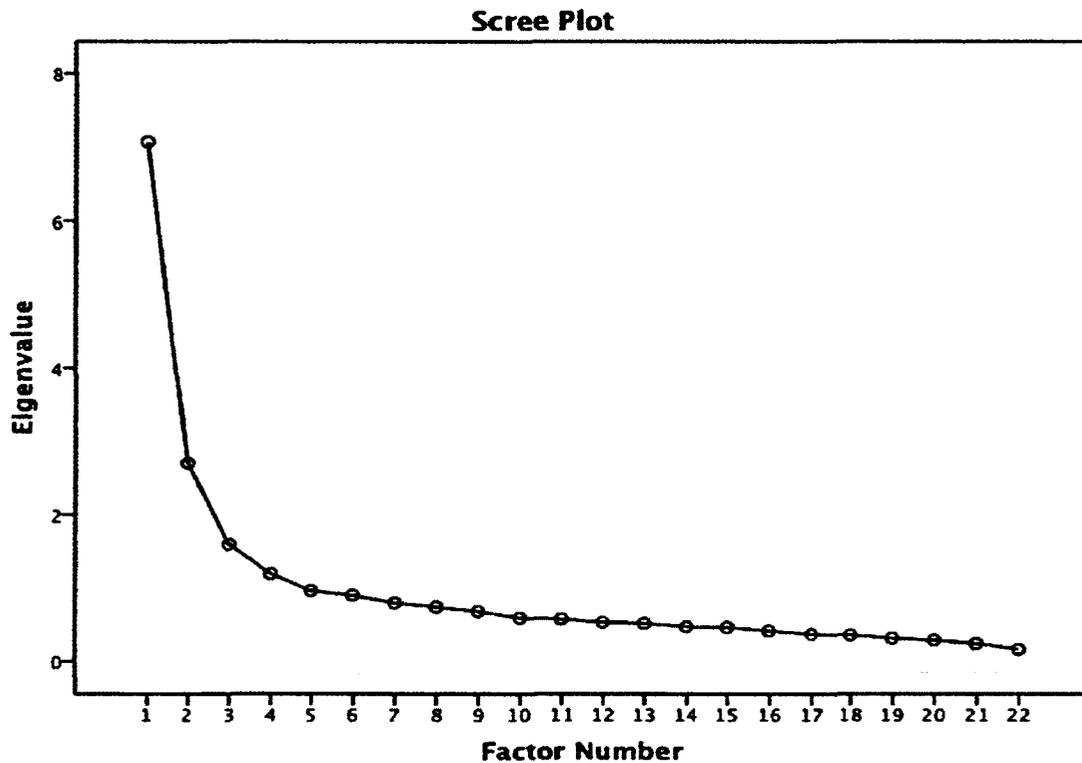
Analysis of the results of the PAF led to several decisions regarding the content of the scale. DeVellis (1991) based item retention criteria for a scale on several factors: inter-item correlation, item variance, and interpretability. To assess these criteria, a factor weight cut-off of .40 was set (Bennett & Robinson, 2000; Hinkin, 1998). Conscientiousness items, which accounted for 13 of 22 items in the scale, were reduced in the next iteration of the scale to work toward a more parsimonious model and reduce redundancy (Hinkin, 1998). The six conscientiousness items that did not load sufficiently (i.e., greater than .40) onto its factor were dropped (items 8, 14, 16, 17, 18, & 19, as

Table 2.

Principal Axis Factor Analysis: Varimax (Orthogonal) Rotation

Item	Description	Factor Loading			
		1	2	3	4
1.	Organized (C).	**.89**	.05	.17	.11
2.	Disorganized (C).	**.82**	-.05	-.01	.21
3.	I like to keep my belongings neat and organized (C).	**.80**	.18	.16	-.09
4.	Neat (C).	**.76**	.17	.16	.10
5.	I always have a place for everything and everything in its place (C).	**.65**	.12	.23	-.12
6.	Orderly (C).	**.56**	.10	.30	.13
7.	I try to set a schedule for accomplishing tasks and stick to it (C).	**.49**	.17	.24	.13
8.	If I start something I work until it is finished to my satisfaction (C).	**.37**	.28	.25	.19
9.	I am always generous when it comes to helping other (A).	.09	**.79**	.04	.04
10.	I always treat others with kindness (A).	.10	**.73**	.09	-.10
11.	I like to help others when they are down on their luck (A).	.04	**.71**	.05	.13
12.	Helpful (A).	.18	**.67**	.10	.14
13.	Even if I don't like them, I always try to be considerate of others (A).	.05	**.58**	.12	-.06
14.	I always try to do more than expected of me (C).	.27	**.54**	.34	.23
15.	Efficient (C).	**.43**	.14	**.40**	.27
16.	Precise (C).	**.34**	.11	**.59**	.19
17.	Thorough (C).	**.36**	.13	**.51**	.15
18.	Responsible (C).	.34	.26	**.44**	.19
19.	Careful (C).	.30	.22	.29	.13
20	Philosophical (O).	.02	.02	.21	-.08
21.	When I am under stress I often feel that I am about to breakdown (ES).	-.01	-.03	.06	**.67**
22.	Sometimes I feel discouraged and want to give up (ES).	.17	.13	-.01	**.60**

Notes. Underlying personality factor displayed in parentheses. A – Agreeableness. C – Conscientiousness. ES – Emotional Stability. O – Openness. Loadings greater than .35 are in bold font.

numbered in Table 2). Additionally, after examination of the "alpha if item deleted"

output from SPSS, the three weakest conscientiousness items were removed in an effort

to reduce the overall number of items in this factor while maintaining or increasing the

factor's reliability (items 5, 6, & 7; Bauer et al., 2001). The six agreeableness items

loaded distinctly onto one factor; the two weakest items were dropped from this group

(i.e., items 13 & 15). Both emotional stability items, which hung closely together,

remained in the scale. The openness item did not load onto any factor and is not

considered part of the integrity content domain; therefore, this item was dropped from the

scale. In total, four conscientiousness items, four agreeableness items, and two emotional

stability items were retained to arrive at a 10-item scale.

A subsequent PAF, with Varimax rotation, of the 10-item scale produced three

distinct factors. With three underlying personality constructs expected, classification of

the three factors identified by the scree plot was straightforward: conscientiousness,

agreeableness, and openness. Cronbach's alphas for each of the factors were as follows:

conscientiousness $\alpha=.87$, agreeableness $\alpha=.82$, and emotional stability $\alpha=.63$. The total

model scale accounted for 70.59% of the total variance and 57.65% of the extracted

rotated variance, a notable improvement over the 22-item model. Communalities ranged

from .45 to .75 and all factor loadings were greater than .64. Table 3 outlines the rotated

(Varimax) factor loadings for the 10-item scale.

Phase 2: Scale Validation

Method

Data Sets. The second phase undertook validation of the newly developed scale.

The TSD Integrity scale was validated using two TSD-PI datasets, both collected from

CFLRS, but between-subjects and at different time points. The first data set was obtained

from the participants described above; the second dataset was archival data that included

Table 3.

Principal Axis Factor Analysis: Varimax (Orthogonal) Rotation

		Factor Loading		
Item	Description	1	2	3
1.	I like to keep my belongings neat and organized (C).	**.85**	.16	-.03
2.	Organized (C).	**.85**	.06	.18
3.	Neat (C).	**.77**	.17	.17
4.	I always have a place for everything and everything in its place (C).	**.69**	.11	-.09
5.	I am always generous when it comes to helping others (A).	.09	**.82**	.01
6.	I like to help others when they are down on their luck (A).	.05	**.73**	.10
7.	Helpful (A).	.19	**.68**	.14
8.	I always treat others with kindness (A).	.14	**.66**	-.05
9.	When I am under stress I often feel that I am about to breakdown (ES).	-.03	-.01	**.70**
10.	Sometimes I feel discouraged and want to give up (ES).	.13	.13	**.64**

the TSD-PI, which was also collected from CF recruits at CFLRS. The second data set (N

$= 429$) involved the TSD-PI and was used to cross-validate the 10-item measure and

assess the validity of the scale structure. This data set also included the two measures of

job performance. The secondary sample, although collected almost a decade earlier (i.e.,

2003), is very similar to the primary dataset as participants were NCMs from CFLRS

conducting BMQ. The average age was 24.18 (SD = .35), and 86% were male, which is,

again, representative of the military gender demographic. Sixty-three percent of

respondents reported their primary language to be English with the remainder indicating

their mother tongue as French.

Measures. The Honesty-Humility scale of the HEXACO personality inventory

(Lee & Ashton, 2004) was used to assess convergent validity. A measure of

organizational commitment (Meyer & Allen, 1991) assessed the discriminant validity for

the TSD Integrity scale. Finally, two criteria were measured: CWB and job performance.

These measures are described above.

Results

Confirmatory Factor Analysis (CFA). EQS 6.1 was used to conduct the CFA

(Bentler & Wu, 2004). Bollen (1989) recommended use of multiple fit indices to assess

the fit of the data to the model. In line with Meyers et al.'s (2006) recommendations, I

reported the RMSEA and CFI. Additionally, the non-normed fit index (NNFI) is another

relative fit indicator that is reported; scores greater than .95 indicate good fit of the data.

Meyers et al. also suggested reporting the Satorra-Bentler robust chi-square statistic as it

is used ubiquitously to compare models.

I applied the robust multiple least squares method of estimation because the

normalized estimate of multivariate kurtosis was violated (Meyers et al., 2006). The CFA

showed a good fit of the second data set for the three-factor model, χ^2 (32, N = 429) =

85.12, $p < .001$, RMSEA = .063, CFI = .959, NNFI = .942 (Loehlin, 2004). The three-

factor model was significantly better than the hypothesized one-factor model as

determined by a chi-square difference test, χ^2_{diff} (13) = 1255.39, $p < .001$; a lower AIC

statistic also supports this assertion (Schreiber, Nora, Stage, Barlow, & King, 2006). The one-factor model displayed poor fit results, again applying the second data set, χ^2 (45, N = 429) = 1340.51, p < .001, RMSEA = .196, CFI = .562, NNFI = .436.

Table 4 outlines the goodness-of-fit statistics for both the three- and one-factor models. Additionally, with identical items administered to respective samples, the data points for the primary and secondary datasets were merged for the sole purpose of further validating the structure and dimensionality of the three-factor scale (N = 817). The positive results of the CFA with the merged dataset provides additional evidence of the stability of the model considering the two samples were collected ten years apart, χ^2 (32, N = 817) = 107.14, p < .001, RMSEA = .055, CFI = .970, NNFI = .958.

Table 4.

Model fit indices.

Model	χ^2	df	p	CFI	NNFI	RMSEA	AIC
3-factor	85.12	32	.000	.959	.942	.063	21.12
1-factor	1340.51	45	.000	.562	.436	.196	532.96
Merged dataset, 3-factor	107.14	32	.000	.970	.958	.055	43.14

Correlational Analysis. Using the primary data set to conduct bivariate correlations, the TSD Integrity scale, as a three-factor composite, was significantly correlated with the H-H scale (r=.22, p < .01). Of the four sub-factors, the strongest correlation was found with fairness (r =.28, p < .01). The sub-factor modesty did not produce a significant correlation (r =.08, p >.05).

The TSD Integrity scale was not significantly correlated with the organizational commitment scale ($r = .09$, $p > .05$), as expected. Although there were modest significant correlations for each of the sub-factors (see Table 6).

As expected, the TSD Integrity scale produced a strong, negative relationship with the broad measure of CWB ($r = -.40$). In addition, the integrity test showed consistent correlations with each of CWB three sub-factors: personal aggression ($r = -.32$), production deviance ($r = -.36$), and property deviance ($r = -.23$).

Support was provided for hypothesis 4 as the correlations between the TSD Integrity scale and personality factors within the TSD-PI were consistent with the proposed relationships; conscientiousness ($r = .83$), agreeableness ($r = .61$), and emotional stability ($r = .33$) were stronger than openness ($r = .17$) and extraversion ($r = .28$). To show further support for this hypothesis, table 5 presents the correlations between each of the Big 5 factors and the TSD Integrity test using both the primary and the secondary datasets. Due to the nature of how the TSD Integrity test was developed, the correlations between the test and conscientiousness, agreeableness, and emotional stability are likely inflated. That is, these three factors of the Big Five, as measured by the TSD-PI, include the same items that are used within the TSD Integrity test. Therefore, table 5 also shows the correlations between variables with the TSD Integrity test items removed from the TSD-PI sub-factors.

Overall, these results provided initial support for the construct validity of the integrity measure.

Table 5.

Correlations between TSD Integrity Test and Big 5 factors.

	All TSD-PI items included		TSD Integrity Test items removed	
	Primary	Secondary	Primary	Secondary
Conscientiousness	.83	.85	.77	.81
Agreeableness	.61	.59	.55	.52
Emotional Stability	.33	.48	.28	.44
Openness	.17	.14	.17	.14
Extraversion	.28	.30	.28	.30

Table 6.

Means, Standard Deviations, and Intercorrelations among study variables

Variable	M (SD)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1 Age[1]	1.69 (1.1)																	
2 Gender[2]	1.17 (.38)	.14**																
3 Education[3]	0.88 (.61)	.38**	.14**															
4 TSD Integrity	5.30 (.72)	.14**	.19**	.09	(.76)													
5 Conscientiousness	5.06 (1.16)	.15**	.21**	.10	.81**	(.87)												
6 Agreeableness	5.65 (.80)	.08	.16**	.10*	.67**	.28**	(.82)											
7 Emotional Stability	5.08 (1.31)	.01	-0.05	-.04	.50**	.12*	.13*	(.63)										
8 Sincerity	5.11 (1.08)	.05	0.08	-.03	.15**	.02	.20**	.14**	(.49)									
9 Fairness	5.46 (1.18)	.07	.20**	-.01	.28**	.18**	.30**	.10*	.43**	(.64)								
10 Greed	4.41 (1.37)	.16**	.17**	.09	.12*	.04	.14**	.11*	.26**	.33**	(.75)							
11 Modesty	5.14 (1.12)	-.03	.19**	-.07	.08	-.07	.24**	.07	.36**	.36**	.50**	(.64)						
12 Affective	4.26 (.47)	-.02	.10*	-.07	.25**	.15**	.18**	.22**	.09	.23**	.10	.10*	(.33)					
13 Normative	4.22 (.67)	-.03	0.03	-.02	.12*	.03	.11*	.15**	.04	.13**	-.01	.02	.48**	(0.66)				
14 Continuance	3.17 (.78)	-.02	-0.05	.02	-.11*	-.04	-.05	-.17**	-.12*	-.19**	-.19**	-.16	-.01	.18**	(0.65)			
15 Property Deviance	1.15 (.30)	-.01	-0.05	-.04	-.23**	-.12	.21	-.18	-.15**	-.24**	-.16**	-.15**	-.06	-.09	0.04	(0.32)		
16 Production Deviance	1.70 (.52)	-.15**	.14**	-.10	-.36**	-.21	.28	-.28	-.22**	-.42**	-.28**	-.15**	-.11*	-.06	.18*	.41**	(0.72)	
17 Personal Aggression	1.80 (.72)	-.17**	-.24**	-.08	-.32**	-.17	.36	-.36	-.19**	-.31**	-.23**	-.22**	-.01	-.01	.05	.28**	.47**	(0.84)

Notes. * $p < 0.05$; ** $p < 0.01$. TSD Integrity scale factors labeled 2 to 4. Honesty-Humility scale factors labeled 5 to 8. Organizational commitment factors labeled 9 to 11. CWB factors labeled 12 to 43. Cronbach's alpha on diagonal in parentheses. Correlations and reliabilities for TSD Integrity scale and sub-factors based on primary dataset. 1. Age coding: 1=18-25, 2=26-30, 3=31-35, 4=41-50, 5=51-60. 2. Gender coding: 1=male, 2=female. 3. Eductation coding: 1=High School, 2=College, 3=Undergraduate, 4=Graduate, 5=None of the above.

Demographic Analysis. It is important that this measure not be biased toward a

particular group, particularly gender (Catano et al., 2005); therefore, demographic

differences were analyzed. First, a t-test was conducted to directly compare men ($M =$

5.24, $SD = .73$) and women ($M = 5.60$, $SD = .60$), t (383) = 60.80, $p < .01$. With a

significant difference between the two groups, a test of correlational difference was

conducted to determine if the difference affected the prediction of CWB (Bobko, 2001).

The correlation between male TSD Integrity test scores and CWB ($r = -.36$) was

compared with female Integrity test scores with CWB ($r = -.38$). VassarStats (n.d.) was

used to conduct Fisher's correlation significance difference method, transforming the

correlations into a z-score and conducting a test of significance (taking into account

sample size). There were no significant differences between men and women, *Fisher's z*

$= .17$, $p > .05$, *ns*, indicating that the samples are statistically similar (Bobko, 2001). As a

precaution, gender was controlled in step one of each of the analyses.

Comparisons were also conducted between mother tongue, levels of education,

and age groups with a one-way analysis of variance (ANOVA) as these demographic

variables vary among members of the CF and it is important that the TSD Integrity test

not be biased toward a particular group. Of these three variables, 'level of education',

$F(4,381) = 3.06$, $p < .05$, and 'age', $F(5,381) = 2.83$, $p < .05$, produced significant

differences between its groups. Specific to 'level of education', respondents who

completed an undergraduate degree ($M = 5.61$, $SD = .61$, 95% CI [5.40, 5.80]) scored

higher on the TSD Integrity measure than those who completed high school as their

highest level of education ($M = 5.23$, $SD = .70$, 95% CI [5.13, 5.33]). Regarding the

differences between age groups, the youngest group (18-25 year-olds; $M = 5.20$, $SD =$

.71, 95% CI [5.11, 5.29]) and the next youngest group (26-30 year-olds; $M = 5.48$, $SD =$

.74, 95% CI [5.31, 5.65]) were significantly different. Due to the group level differences

of these constant variables, they were controlled in step one of each of the hierarchical

regression analyses.

Criterion-Related Validity. As indicated, a self-report measure of CWB was

included during the administration of the primary dataset; only the job performance data

were attained from the secondary dataset. The datasets were not combined.

To establish criterion-related validity it was necessary to show that the 10-item

TSD Integrity scale explained additional variance of CWB over and above that of the Big

5 factors represented in the TSD-PI. In the first step of a hierarchical regression with the

measure of CWB as the criterion, age, gender, and education were added as covariates.

Age and gender were significant predictors of CWB, $R = .27$, $F(3, 376) = 9.64$, $p < .01$.

The Big 5 factors of the TSD-PI were entered in the second step of the regression. The

inclusion of the Big 5 factors predicted beyond the demographic variables entered in the

first step, $R = .49$, $R^2_{change} = .23$, $F_{change}(5, 371) = 16.75$, $p < .01$. All factors except

openness contributed significant unique variance to the prediction of CWB. In total, the

five factor model accounted for 23% of the variance. Finally, the third step included the

TSD Integrity scale, which significantly predicted CWB over and above the previous

variables, $R = .50$, $R^2_{change} = .01$, $F_{change}(1, 370) = 4.52$, $p < .05$. These results provide

support for Hypotheses 5a. Table 7 summarizes the unstandardized and standardized beta

weights for each of the predictors.

Subsequent hierarchical linear regressions were conducted in order to further

assess the concurrent validity of the TSD Integrity test. Similar to the correlation table

Table 7.
Results of Hierarchical Linear Regression: Predictors of CWB

	B	SE (B)	β	ΔR^2
Step 1 - Controls				.07**
Age	-.05	.02	-.14*	
Gender	-.21	.02	-.02	
Education	-.01	.05	-.21**	
Step 2 – Big 5 Factors				.17**
Conscientiousness	-.06	.02	-.12*	
Agreeableness	-.19	.03	-.34**	
Emotional Stability	-.08	.02	-.21**	
Openness	.02	.02	.06	
Extroversion	.06	.02	.18**	
Step 3				.01*
Integrity Scale	-.13	.06	-.23*	

Notes: Overall adjusted R^2=.23. The beta weights reported are the values at each step.
* $p < .05$.
** $p < .01$.

(Table 5), the TSD Integrity test items were removed from the Big 5 factors of the TSD-

PI in order address the issue of singularity in the factors. That is, the items of the TSD

Integrity test appear twice in the previous analysis, thereby creating singularity in the

regression equation. The most notable result is an increase in incremental validity

explained by the TSD Integrity test to 2% (Table 8).

Next, a hierarchical linear regression was conducted in order to examine the direct

predictive effect of the TSD Integrity test without the Big 5 in the equation, controlling

only for demographic variables. This analysis showed that, without controlling for the

five-factor model, the TSD Integrity test accounted for 12% of the variance of CWB

(Table 9).

Table 8.

Results of Hierarchical Linear Regression: Predictors of CWB with TSD Integrity test items removed from Big 5 Factors.

	B	SE (B)	β	ΔR^2
Step 1 - Controls				.07**
Age	-.05	.02	-.14*	
Gender	-.21	.02	-.02	
Education	-.01	.05	-.21**	
Step 2 – Big 5 Factors				.17**
Conscientiousness (no Integrity items)	-.08	.03	-.15*	
Agreeableness (no Integrity items)	-.16	.03	-.30**	
Emotional Stability (no Integrity items)	-.08	.02	-.17**	
Openness	.02	.02	.05	
Extroversion	.06	.02	.17**	
Step 3				.02*
Integrity Scale	-.14	.04	-.26*	

Notes: Overall adjusted R^2=.26. The beta weights reported are the values at each step.
* $p < .05$.
** $p < .01$.

Table 9.

Results of Hierarchical Linear Regression: Predictors of CWB without controlling for Big 5.

	B	SE (B)	β	ΔR^2
Step 1 - Controls				.07**
Age	-.05	.02	-.14*	
Gender	-.21	.02	-.02	
Education	-.01	.05	-.21**	
Step 2				.12**
Integrity Scale	-.19	.03	-.35**	

Notes: Overall adjusted R^2=.19. The beta weights reported are the values at each step.
* $p < .05$.
** $p < .01$.

Marcus, Lee, and Ashton (2007) reported that the Honesty-Humility scale of the

HEXACO-PI accounted for a portion of the predictive validity of personality-based

integrity tests. Therefore, it was meaningful to assess whether the TSD Integrity test

predicted CWB over and above the Honesty-Humility scale. The results of a hierarchical

linear regression, adding the Honesty-Humility scale in step two and the TSD Integrity

test in step three, indicate that the integrity test added significant incremental validity

beyond Lee and Ashton's (2004) sixth personality factor, $R = .55$, $R^2_{change} = .07$, F_{change} (1,

369) = 36.34, $p < .001$ (Table 10).

Table 10.
Results of Hierarchical Linear Regression: Predictors of CWB over and above the Honesty-Humility scale.

	B	$SE (B)$	β	ΔR^2
Step 1 - Controls				.07**
Age	-.05	.02	-.14*	
Gender	-.21	.02	-.02	
Education	-.01	.05	-.21**	
Step 2 – Big 5 Factors				.16**
Sincerity	-.02	.02	-.05	
Fairness	-.11	.02	-.31**	
Greed	-.04	.02	-.13**	
Modesty	-.01	.02	-.02	
Step 3				.07**
Integrity Scale	-.15	.03	-.28**	

Notes: Overall adjusted $R^2 = .30$. The beta weights reported are the values at each step.
* $p < .05$.
** $p < .01$.

Sequential logistic regression assessed the predictors of the first measure of job

performance, a dichotomous dependent variable (i.e., pass or fail). Three covariates were

entered in the first step (i.e., age, language, and gender). Although the inclusion of these

demographic variables was significant overall, χ^2 (3, $N = 429$) = 9.40, $p < .05$, as a group

they did not improve prediction of group membership from the constant-only model at

78.7% accuracy. The Big 5 factors were added in the second block of the equation. The addition of these variables into the regression was not significant, χ^2 (3, N = 429) = 9.16, p > .05. The 10-item integrity scale was the only variable entered in the third and final step. The inclusion of this variable significantly increased the predictability of the model, improving overall prediction rate to 81%, χ^2 (1, N = 429) = 11.76, p < .001. The results indicate that the overall model predicted success on the BMQ course 99% of the time; it predicted failure at a much lower rate, 14%. Overall, the results provide support for Hypothesis 5b; the Integrity scale is predictive of success on BMQ. Table 11 summarizes the logistic regression results.

Table 11.
Sequential Binary Logistic Regression Analysis: Predictors of Job Performance (Pass/Fail).

	β	SE	Odds Ratio	Wald statistic
Step 1 - Controls				
Age	-.02	.02	.98	.51
Gender	-.73	.32	.48	5.18*
Language	.46	.25	1.58	3.32
Step 2 – Big 5 Factors				
Conscientiousness	.26	.17	1.29	2.26
Agreeableness	-.11	.20	.90	.30
Neuroticism	-.20	.10	.82	3.43
Openness	-.12	.12	.88	1.50
Extroversion	.05	.14	1.05	.11
Step 3				
Integrity scale	1.55	.47	4.71	11.06***

* $p < .05$.
** $p < .01$.
*** $p = .001$.

Hierarchical regression was used to predict the composite measure of job performance. The overall job performance score, which was a continuous variable, was

regressed first onto the covariates, then the Big 5, and, finally, the TSD Integrity scale.

The overall model was a significant predictor of the overall job performance score, $R^2 =$

.081, $F(9, 371) = 3.652$, $p < .001$. The covariates, age, education, and primary language

were entered in the first step of the regression equation and significantly predicted the

dependent variable, $R = .15$, $R^2 = .023$, $F(3, 377) = 3.015$, $p < .05$. The Big 5 factors

were entered together in the second step and also, as a group, significantly added to the

prediction of the dependent variable, $R = .26$, $R^2 = .071$, $R^2_{change} = .046$, $F_{change}(5, 372) =$

3.709, $p < .01$. However, only neuroticism (emotional stability reverse coded) added

unique predictor variance, $t = -3.22$, $p < .01$. In total, the five-factor model accounted for

5% of the variance. Finally, the TSD Integrity scale was entered into the regression

equation and significantly increased prediction of a recruit's overall performance over

and above the demographic variables and the Big 5, $R = .26$, $R^2 = .081$, $R^2_{change} = .012$,

Table 12.
Results of Hierarchical Linear Regression:
Predictors of Job Performance (Overall Score)

	B	SE B	β	ΔR^2
Step 1 - Controls				.02*
Age	-.380	1.64	-.01	
Gender	-73.92	26.33	-.14*	
Language	-15.33	18.82	-.04	
Step 2 – Big 5 Factors				.05*
Conscientiousness	15.61	12.13	.08	
Agreeableness	-26.97	13.89	-.11	
Neuroticism	-27.61	8.56	-.18**	
Openness	4.54	8.46	.03	
Extroversion	-1.37	9.87	-.01	
Step 3				.01*
Integrity Scale	68.53	31.69	.31*	

Notes: Overall adjusted $R^2 = .08$. The beta weights reported are the values at each step.
* $p < .05$.
** $p < .01$.

F_{change} (1, 371) = 4.678, $p < .05$. Table 12 provides the results for the variables entered

into the models.

Discussion

The purpose of this study was to create a personality-based measure of integrity

for use within the CF that is predictive of general CWB and job performance on BMQ.

Furthermore, the instrument was intended to be created from a composite of the

personality factors conscientiousness, agreeableness, and emotional stability. In order to

provide practical value to the CF, the measure needed to predict the criterion beyond the

Big 5 personality factors.

The first phase of the construct validation process was the evaluation of the TSD

Integrity scale's dimensionality. A CFA showed that three components are included

within the 10-item scale, which resembles the factor structure of personality-based

integrity measures proposed by Ones et al. (1993) and other researchers (Berry, Ones, &

Sackett, 2007; Marcus, Hoft, & Riedeger, 2006; Wanek et al., 2003). The dimensionality

of the scale was further strengthened after conducting cross-validation with a separate,

but similar data set that showed comparable dimensionality and fit.

Finally, after combining the two data sets, CFA again produced acceptable fit

indicating that the results were not due to confounding factors at the recruit school during

the time of administration of either dataset. Hypothesis 1, which stated that the TSD

Integrity test would load onto one factor, was not supported; this particular hypothesis

was tenuous when posited, as there was little evidence in the literature that a one-factor

scale of integrity was plausible. A three-factor structure garnered substantially more

support from the literature, and was the resulting structure in this study. Hypothesis 4

suggested that the TSD Integrity scale would be closely related to the three principal

factors of personality-based integrity tests: conscientiousness, agreeableness, and

emotional stability. The results showed that the TSD Integrity test produced stronger

correlations with these three factors than the remaining two factors of the FFM: openness

and extroversion, substantiating hypothesis 4. Additionally, the removal of the TSD

Integrity test items from the TSD-PI factors in subsequent regression analyses

emphasized the support for the relationship between conscientiousness, agreeableness,

and emotional stability with this personality-based integrity test.

The TSD Integrity test, based on the manner it was developed and the resulting

factor structure is considered multidimensional (three-dimensional to be specific). The

measure is, therefore, a formative-indicated model rather than reflective as the three

factors contribute to 'forming' the latent construct, integrity (Diamantopoulos & Siguaw,

2006). However, this scale does not necessarily meet all the criteria for a formative test.

Typically, a formative measure will derive its meaning from the sub-factors, rather than

the latent construct (MacKenzie, Podsakoff, & Burke-Jarvis, 2005). The TSD Integrity

test's meaning rests in the construct of integrity as opposed to the three personality

factors. Also, Bollen and Lennox (1991) indicated that factors of a reflective measure

often follow a common theme, whereas the indicators of a formative measure are usually

distinct. The three factors of the TSD Integrity scale do share a theme: personality.

These signals provide evidence of a reflective-model; however, the nature that it was

developed points squarely to the notion that this scale is formative. The development of

this scale does not fit neatly into a test development mould and the nature of its meaning

follows suit. The implications of this distinction may apply in future studies; the latent

construct of integrity, should be modeled based on its formative indicators:

conscientiousness, agreeableness, and emotional stability.

The analyses conducted in this study are based on a composite latent construct

model. That is, the construct of integrity has been formed as measured by

conscientiousness, agreeableness, and emotional stability and the subsequent analyses

were conducting using the composite measure rather than the individual indicators. The

results of the regression analyses and correlations with the three factors are presented in

appendix A and table 6, respectively; however, the principal results are focused on the

formative construct, integrity, because of its meaningfulness to the study. To interpret

the results otherwise would be misleading and, perhaps, confusing given the unobvious

link between the three factors and integrity.

The relationship between the TSD Integrity scale and the Honesty-Humility scale

of Lee and Ashton's (2004) HEXACO personality measure was assessed to further

demonstrate construct validity for the TSD Integrity scale. The Honesty-Humility scale

is ostensibly a measure of integrity; Lee et al. (2005) implied that it is not a direct

measure of integrity, but it resembles the construct's domain and demonstrated strong

correlations with overt integrity tests. Based on this information the TSD Integrity test

was expected to correlate modestly with the Honesty-Humility scale. The resulting

correlation between the two instruments displayed convergent validity for the TSD

Integrity scale ($r = .22$), supporting hypothesis 2. In addition, the relationships between

the TSD Integrity scale and the Honesty-Humility scale's sub-factors sincerity and

fairness were the strongest of the four sub-factors ($r = .15$ & $r = .28$, respectively); the

content of these two constructs most closely resembles the operationalized definition of

integrity in this study.

The TSD Integrity scale also demonstrated divergent validity with Meyer and

Allen's (1991) scale of organizational commitment. The correlation between the TSD

Integrity test and the measure of organizational commitment was lower than the scale's

relationship with the Honesty-Humility measure, providing support for hypothesis 3.

Although the relationships between the TSD Integrity scale and the sub-factors of the

organizational commitment measure were not hypothesized, the results of the analysis are

interpretable and continue to add validity to the instrument in question. Affective

commitment showed the strongest correlation of the three components, suggesting that an

employee who exhibits higher levels of integrity is more likely to form a positive

emotional connection with their organization. Although, it must be noted that the internal

consistency of the affective commitment scale was very poor ($\alpha = .33$). Therefore, the

scale, with this particular dataset, is quite unreliable. This result may be because the

participants are extremely new to the CF and, perhaps, have not had an opportunity to

develop affection toward the organization, which created a low level of response

variance. However, it is not likely that this factor would entirely explain such an

inconsistent level of response in the scale. Therefore, the relationship of this scale with

the TSD Integrity test should be viewed with reservation. Normative commitment was

also positively correlated with integrity. As a post-hoc argument, it is comprehensible

that a person with integrity would develop a sense of duty or loyalty to stay with their

employer, explaining the positive direction of the correlation. Interestingly, continuance

commitment resulted in a negative correlation with the TSD Integrity scale. This

relationship indicates that a person with higher levels of integrity is less likely to remain

with the organization purely for fiscal purposes, which would be a desirable characteristic

in a new hire.

Finally, criterion-related validity was evaluated using the two criteria most

common to personality-based integrity tests: CWB and job performance (Wanek, 1999).

Hierarchical linear regression provided evidence that the TSD Integrity scale predicted

the general CWB measure, over and above the Big 5 personality factors, supporting

hypothesis 5a. The TSD Integrity test's correlation of $r= -.40$ with a broad measure of

CWB was stronger than the relationships reported in Ones et al.'s (1992) meta-analysis

(i.e., $r = -.29$). This finding is consistent with previous research by Lee et al. (2005) who

found that the Honesty-Humility scale of the HEXACO-PI outperformed the FFM in the

prediction of workplace delinquencies. Of the three sub-factors of Stewart et al.'s (2009)

CWB instrument, the TSD Integrity scale related closely to all three constructs: property

deviance ($r = -.23$), production deviance ($r = -.36$) and personal aggression ($r = -.32$).

Cronbach's alpha for the production deviance and personal aggression factors were

adequate (Schmitt, 1996); however, similar to the affective commitment factor of the

organizational commitment scale, the property deviance factor produced a very low level

of internal consistency ($\alpha = .32$). A possible explanation for this result stems from the

nature of the self-report items and the propensity for the recruits to answer honesty. For

example, of the four items, one item asks if the person "used illicit drugs" in the past year; another questions whether the participant has stolen anything from work. The nature of these items likely appears much more severe than items from the other two factors and, therefore, the participants, were not as inclined to answer honestly, producing a low degree of response variance. After taking into account the low reliability of the property deviance factor, these results, in general, indicate that the integrity measure may be better suited to predict broad measures of CWB, rather than a specific negative behaviour such as absenteeism or theft. This supposition is consistent with Ones et al.'s (2003) conclusion that personality-based integrity tests are better measure of general CWB than overt tests. Based on the results of this study the use of the TSD Integrity test for prediction of applicants who may be counterproductive to the organization may be justified.

Regression analysis also supported the hypothesis that the TSD Integrity scale would predict a recruit's performance on their BMQ course. Interestingly, none of the Big 5 factors were predictive of success on BMQ. This finding was not consistent with Boyes' (2006) research that suggested conscientiousness is predictive of job performance on BMQ; nor was my finding in line with other general FFM research that also implied this relationship (Barrick, Mount, & Judge, 2001; Salgado, 1997). The sample size was not likely an issue in detection of a significant difference; however, it is possible that there was not enough variability across the factor to create a significant effect as the sample is, in general, quite homogeneous due to the military selection process. The results showed that the integrity measure successfully grouped the recruits into either a

pass or fail category (Wald = 11.06), supporting hypothesis 5b. The finding from this

stage of the study is particularly notable considering none of the Big 5 factors of the

TSD-PI did not significantly predict job performance, yet the TSD Integrity test, created

from portions of these same factors, resulted in a significant prediction. The result

clearly distinguishes the integrity measure from conscientiousness, which has been a

matter of debate in the personality and integrity literature (Marcus et al., 2006; Murphy &

Lee, 1994).

As an additional measure of job performance, a composite score of performance

factors on the BMQ was predicted by the TSD Integrity scale beyond the Big 5 factors.

In this analysis, I continued to control for age, gender, and primary language entering

these factors in the first step of the hierarchical linear regression. Only gender was a

significant predictor of job performance (t =-2.81). The second step showed that the

TSD-PI, as a whole, predicted significant incremental variance of the composite score,

which is consistent with Boyes' (2006) research. However, only neuroticism added

significant unique variance to the equation (t = -3.22). The TSD Integrity test, again,

predicted job performance over and above the FFM as measured by the composite score,

providing strong criterion-related validity for the measure.

Implications for the CF

In order for any organization to adopt a new selection instrument several criteria

must be met. Most notably, the tool must add value to the selection system. That is, the

cost of administering such a measure must provide a return that the organization believes

outweigh the cost of obtaining and administering the tool. Assessing this return is often

difficult as the benefits are difficult to measure, especially when the instrument is

designed to 'select-out' job applicants as is the case for many integrity measures that seek

to identify candidates that may be disruptive to the organization (Catano et al., 2005). A

utility analysis of the selection tool would provide a tangible estimation of the value of

the instrument (Catano et al., 2005). A second criterion for adoption of a selection

instrument is the incremental validity the tool provides over existing measures. As an

example, the CF has commenced using the TSD-PI to predict success on the BMQ

course; the TSD Integrity test, as demonstrated in this study, explains additional job

performance and CWB variance beyond the TSD-PI. Therefore, after further research

replicating the findings of this study, the CF may wish to adopt this scale in order to get a

more accurate prediction of who will (and will not) be successful at basic training. In

addition, the scale will provide an assessment of who may be a liability to the CF because

of potential behavioural problems. The value added feature of this particular test is that it

is already being administered to CF applicants via the TSD-PI. There is no additional

survey for the applicants to complete; there is no extra fee to the CF other than the cost of

the time it takes to interpret the score. Essentially, if the results of this study remain

consistent in future examinations of the scale, the TSD Integrity test will provide

considerable benefit to the CF selection system with negligible drawbacks.

The TSD Integrity test is negatively correlated with CWB and has a positive

relationship with job performance; therefore, the higher an applicant scores on the

measure, the 'better' their score. At this point, before further validation, it is difficult to

place a label on a score (e.g., average, above average) without normed data. However,

considering the TSD-PI has been administered at CF recruiting centers there will be ample data to conduct these subsequent studies. Future research and policy decision makers within the CF will decide upon the weight of the scale in the CF selection system. In view of the results of this study, it is recommended that the scale be used as a screening tool in conjunction with existing methods, rather than a 'select-in' application. After further validation, a cut-off point would be established that reliably predicts CWB to a level deemed undesirable by the organization. If an applicant scores below this point, then it may warrant additional investigation into the applicant's integrity through another means such as a situational interview or a deeper background check. In addition, this cut-off point is in accord with the prediction of successful candidates on BMQ. In other words, at some value on the scale, an applicant is likely to succeed on the recruit course and will not likely be counterproductive to the CF.

Other than the slow, time consuming, and often biased background check, the CF does not have any tool in its selection model that resembles a measure of integrity. The CF has a need for a selection measure that corresponds with its highly valued statement of ethics. Potentially, the TSD Integrity test may fit this need. However, the personality-based integrity test developed in this study focuses on selecting individuals that meet the definition of integrity as outlined in the introduction. This definition, which was created with the intent of operationalizing the construct, is not identical to the CF statement of integrity as outlined in the CF Statement of Defense Ethics ("Canadian Forces", n.d.). There should be no illusion that this measure of integrity, as a latent construct, is synonymous with the CF ideal of integrity.

Study Limitations

The most noticeable limitation of this study is the range restriction on the data imposed by the sample. Ideally, an applicant sample would be used for this study because they are the target population; however, this sample was not feasible for this study . The recruits surveyed had already been selected into the CF and, therefore, possessed desirable traits as assessed by the current selection system (i.e., strong past performance, cognitive ability, etc.) making the sample more homogeneous. I did not examine the TSD Integrity test in relation to these predictors; however, the variability of the sample is reduced post-selection, leading to a restriction in the range. This limitation of the study may have impacted the level of significance when predicting the criterion as well as the correlations between study variables (Sackett & Yang, 2000). Although the recruits are new to the organization, I surveyed recruits at various stages of the BMQ course. Potentially, the week of course may have had an effect on the outcomes. For example, a recruit in their first week of BMQ will likely be more unbiased toward the organization and may respond in a more truthful manner than someone in their tenth week at CFLRS.

Another limitation of the study is the monomethod bias that may be present due to the self-report nature of the constructs measured, save job performance (Podsakoff, MacKenzie, & Lee, 2003). Podsakoff et al. (2003) suggested that correlations between study variables measured in the same manner at the same time may be inflated (or deflated) due to method variance. Campbell and Fiske (1959) indicated that method variance could have an impact on variable relationships and lead the researcher to false or

misleading inferences. Although the criterion-related validity surrounding CWB may

suffer from the monomethod bias potentially created from the self-report nature of

variable measurement, it is unlikely. The effect of the bias may be mitigated by the fact

that TSD Integrity scale's dimension validity was supported by two datasets at different

points in time (therefore, not considered cross-sectional).

Although, at the time of administration, I guaranteed the confidentiality of the

surveys to the respondents, it is possible that the recruits did not feel as though they could

answer honestly to the CWB items without repercussion from their superiors. Therefore,

it is possible that the scores provided on the CWB measure are not an accurate

representation of the true scores. However, based on prior social desirability research job

incumbents are more likely to answer truthfully than applicants (Rosse, Stecher, Miller,

and Levin, 1998); therefore, when attempting to measure CWB on a self-report basis,

incumbents are more desirable participants than applicants. There was enough variability

in the responses to elicit an effect of the TSD Integrity test.

Future Research

Future research of the TSD Integrity Test should begin with continued validation

of the measure, particularly using data collected from CF job applicants at recruiting

centres. The reliability of a self-report CWB measure administered at the recruiting

centre is questionable given the likelihood of socially desirable responding (Rosse et al.,

1998); Rosse et al. showed that job applicants are likely to respond to questions in the

manner that they believe the employer desires. Validation of non-selection decisions is

almost impossible considering that these applicants are not likely to participate in

subsequent studies with the CF after being turned down for employment (Catano et al.,

2005). However, the applicants that are selected into the CF can be assessed post-BMQ

for job performance (i.e., success on BMQ); in addition, behaviour during BMQ and once

gainfully employed can also be assessed for counter-productivity.

A subsequent validation study of the TSD Integrity test should include a

comparison of the measure with another personality-based measure of integrity, such as

the Hogan Reliability Scale (Hogan & Hogan, 1989) or the ICES Compliance Scale

(Coyne, Lindley, Smith-Lee Chong, 2002). I used the HEXACO Honesty-Humility scale

as a measure of integrity because of the availability of the scale and its scoring key,

although Lee et al., (2005) indicate that it is not a direct measure of integrity; the scoring

key of the Hogan Reliability Scale is not available for public use. Ideally, a researcher

would solicit a validated measure of integrity to further examine the TSD Integrity test's

convergent validity.

Although faking, or impression management, is more of an issue with overt

integrity tests (Coyne & Bertram, 2002), Alliger and Dwight (2000) also indicated that

personality-based integrity tests are subject to impression management. The use of

faking scales within a personality inventory is common although researchers have not

reached a consensus on the validity of their use in a selection system (Alliger & Dwight,

2000). The CF has a faking scale with the TSD-PI that has shown some promise in

identifying potential fakers (Francis, 2011); however, much more research is needed

before this measure could be used to influence a selection decision. If the CF opts to use

a faking scale of any sort, the TSD Integrity test, along with the TSD-PI, would be

candidates for examination of the effect of faking[2].

This study only evaluated the Non-commissioned members (NCM) of the CF and

did not include enrolled Officers. Future research will need to examine this population as

the results of this study are not generalizable to CF Officers. Boyes' (2006) found

differences between NCMs and Officers in the TSD-PI's ability to predict job

performance; therefore, it can not be assumed that the TSD Integrity test will predict

CWB and/or job performance for Officers.

The CF presently uses a measure of general aptitude known as the CF Aptitude

Test (CFAT) in order to predict success on BMQ (i.e., job performance; O'Keefe, 1998).

Boyes' (2006) found that the conscientiousness factor of the TSD-PI predicted job

performance over and above the CFAT, so it may not be surprising if the TSD Integrity

test further predicts this criterion. Further research in this domain is warranted.

The development of this integrity measure has important implications for

developing future integrity tests. Typically, personality-based measures are created with

the intention of augmenting a personality test (Wanek, 1999). The approach used to

develop the TSD Integrity scale in this study was grounded squarely on the theoretical

knowledge of the relationship between integrity and the three personality factors:

conscientiousness, agreeableness, and emotional stability (Ones et al., 2003). Rather than

conventionally creating items that represent the construct's content, the items of the scale

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[2] During administration of the primary dataset, a fledgling measure of faking was included in the TSD-PI; however, regression analysis showed that the scale had no impact and, therefore, was not included in this study as a moderator.

were drawn from an existing personality measure, the TSD-PI. The literature review

conducted for this study revealed no research that created an integrity scale in this

manner. This study has demonstrated that this method of test development not only

revealed integrity as a latent construct, but also showed that uncovering a 'scale within a

scale' is an effective means of improving an already useful selection tool. Using the

procedures conducted in this study, it is not unreasonable to suggest that a similar

outcome is possible with other existing personality measures. Organizations that

presently administer a personality test within their selection system may find the results

of this study particularly practical.

Conclusion

Personality-based integrity tests have continually shown their value in an

organization's selection model (Ones, 1993). The CF has the opportunity to leverage

their personality inventory and employ the TSD Integrity test, embedded within the

existing tool, to assist in the selection of future CF recruits. This study suggested that the

factor structure of the TSD Integrity test is a three-factor measure, composed of

conscientiousness, agreeableness, and emotional stability. The TSD Integrity test

demonstrated strong construct validity as it converged with the Honesty-Humility scale of

the HEXACO-PI and did not correlate with Meyer and Allen's (1991) measure of

organizational commitment. The TSD Integrity test significantly predicted CWB and job

performance over and above the FFM of the TSD-PI after controlling for age, gender, and

primary language.

This study approached the creation of a personality-based integrity test in a novel manner as the items of the integrity scale were not created, but were drawn from an existing personality inventory. This method of scale development has practical relevance for an organization's selection model as it demonstrates that a selection system can be augmented without the need to create or add an additional tool to the selection model that will take more time to administer to job applicants. Future research should continue to build upon the results of this study to reach a point where CF decision-makers have enough evidence to utilize the TSD Integrity test in the CF selection model.

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Appendix A   Hierarchical Linear Regression analyses with each sub-factor as a predictor of the criterion.

Results of Hierarchical Linear Regression: Conscientiousness as a predictor of CWB.

	B	SE (B)	β	ΔR^2
Step 1 - Controls				.07**
Age	-.05	.02	-.14*	
Gender	-.21	.02	-.02	
Education	-.01	.05	-.21**	
Step 2				.02*
Conscientiousness	-.05	.02	-.16**	

Notes: Overall adjusted R^2=09. The beta weights reported are the values at each step.
* $p < .05$.
** $p < .01$.

Sequential Binary Logistic Regression Analysis: Conscientiousness as a predictor of Job Performance (Pass/Fail).

	β	SE	Odds Ratio	Wald statistic
Step 1 - Controls				
Age	-.02	.02	.98	.51
Gender	-.73	.32	.48	5.18*
Language	-.46	.25	.63	3.32
Step 2				
Conscientiousness	.33	.11	11.44	10.21**

Notes: Overall adjusted R^2=09. The beta weights reported are the values at each step.
* $p < .05$.
** $p < .01$.

Results of Hierarchical Linear Regression: Conscientiousness as a predictor of Job Performance (Composite score).

	B	SE (B)	β	ΔR^2
Step 1 - Controls				.02*
Age	-.38	1.64	-.01	
Gender	-.73.91	26.33	-.14**	
Education	-15.33	18.82	-.81	
Step 2				.01*
Conscientiousness	17.64	7.99	.12*	

Notes: Overall adjusted R^2=.03. The beta weights reported are the values at each step.
* $p < .05$.
** $p < .01$.

Results of Hierarchical Linear Regression: Agreeableness as a predictor of CWB.

	B	SE (B)	β	ΔR^2
Step 1 - Controls				.07**
Age	-.05	.02	-.14*	
Gender	-.21	.02	-.02	
Education	-.01	.05	-.21**	
Step 2				.11**
Agreeableness	-.17	.02	-.34**	

Notes: Overall adjusted R^2=18. The beta weights reported are the values at each step.
* $p < .05$.
** $p < .01$.

Sequential Binary Logistic Regression Analysis: Agreeableness as a predictor of Job

	β	SE	Odds Ratio	Wald statistic
Step 1 - Controls				
Age	-.02	.02	.98	.51
Gender	-.73	.32	.48	5.18*
Language	.46	.25	1.58	3.32
Step 2				
Agreeableness	.06	.14	1.06	.15

Notes: Overall adjusted R^2=09. The beta weights reported are the values at each step.
* $p < .05$.
** $p < .01$.

Results of Hierarchical Linear Regression: Agreeableness as a predictor of Job Performance (Composite score).

	B	SE (B)	β	ΔR^2
Step 1 - Controls				.03*
Age	-.38	1.64	-.01	
Gender	-.73.91	26.33	-.14**	
Education	-15.33	18.82	-.81	
Step 2				.003
Agreeableness	-10.48	10.36	-.05	

Notes: Overall adjusted R^2=.03. The beta weights reported are the values at each step.
* $p < .05$.
** $p < .01$.

Results of Hierarchical Linear Regression: Agreeableness as a predictor of CWB.

	B	SE (B)	β	ΔR²
Step 1 - Controls				.07**
Age	-.05	.02	-.14*	
Gender	-.21	.02	-.02	
Education	-.01	.05	-.21**	
Step 2				.07**
Emotional Stability	-.08	.01	-.27**	

Notes: Overall adjusted R^2=14. The beta weights reported are the values at each step.
* $p < .05$.
** $p < .01$.

Sequential Binary Logistic Regression Analysis: Agreeableness as a predictor of Job

	β	SE	Odds Ratio	Wald statistic
Step 1 - Controls				
Age	-.02	.02	.98	.51
Gender	-.73	.32	.48	5.18*
Language	.46	.25	1.58	3.32
Step 2				
Emotional Stability	2.03	.81	1.28	6.35*

Notes: Overall adjusted R^2=09. The beta weights reported are the values at each step.
* $p < .05$.
** $p < .01$.

Results of Hierarchical Linear Regression: Agreeableness as a predictor of Job Performance (Composite score).

	B	SE (B)	β	ΔR²
Step 1 - Controls				.02*
Age	-.38	1.64	-.01	
Gender	-.73.91	26.33	-.14**	
Education	-15.33	18.82	-.81	
Step 2				.05**
Emotional Stability	25.40	5.66	.22**	

Notes: Overall adjusted R^2=.06. The beta weights reported are the values at each step.
* $p < .05$.
** $p < .01$.

Appendix B   Subject matter expert instructions.

Development of a Measure of Integrity – Item Identification

REB File # 12-045

Hello,

Thank you for volunteering to assist in a research study that intends to identify items from an existing personality inventory in order to develop and validate a measure of Integrity.

Instructions:

Using the operational definition of Integrity **AND** items from an existing Integrity scales (attached) you are asked to identify items from the Trait Self-Descriptive Personality Inventory (TSD-PI) that you believe resemble the construct of Integrity.

The TSD-PI consists of 32 adjectives and 64 statements. Choose from both groups. There is no limit on the number of items you can identify. Use only two levels of identification: Yes – the item resembles Integrity, or, No – the item does not resemble Integrity.

Your responses will be consolidated with the responses of approximately five other Subject Matter Experts (SMEs) and the principle researcher. Any items identified two or more times, by any of the SMEs, will be used in the second stage of the study: initial validation.

Thank you very much for your participation.

Rob Francis

Principle Researcher

Saint Mary's University

Master's Student

902-789-9860

Operational Definition:

Integrity is representative of a person who is honest, dependable, reliable, and conscientious.

Please review the items of the Honesty-Humility Scale of the HEXACO Personality Inventory[3].

Items of the TSD-PI that are similar in nature to these items should be checked.

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[3] The items of the Honesty-Humility scale of the HEXACO-PI are not provided in this paper due to copyright restrictions.

Appendix C   Informed consent form

INFORMED CONSENT FORM
Development of a CF Selection Survey

REB File # 12-045

SSRB Approval 1046/11-F

INTRODUCTION
I am a Masters Student in the department of psychology at Saint Mary's University. I am conducting research under the supervision of Dr. Victor Catano to examine personality traits of CF recruits. The purpose of our study is to examine these personal characteristics to determine if they predict success on BMQ/BMOQ and behaviours that can be counterproductive to the organization.

WHAT WILL I HAVE TO DO?
You are invited to take part in a paper-and-pencil survey. If you agree to participate, you will be asked to provide your responses to 135 questions regarding your personal characteristics. You are then asked to provide background information such as your age and service number. The survey will take approximately 30 minutes to complete.

WHAT ARE THE POTENTIAL BENEFITS AND RISKS OF THIS RESEARCH?
With your participation today, the CF will use your information to develop a selection tool that will be allow it to better select employees who will perform on the job and are less likely to be disruptive or counterproductive to the organization. It is highly probable that you will eventually work alongside these future employees and, therefore, will benefit from a more productive work environment. Due to the nature of the research, your participation in this study will require that you volunteer or share personal experiences and information, but there is no anticipated risk or discomfort associated with the questions.

HOW CAN I WITHDRAW FROM THIS STUDY?
Your participation is **completely voluntary**. You will be free to withdraw from the study at any point. If you choose to withdraw during the administration session, write the word 'Withdraw' on the **second** page of your survey. You will be provided with my contact information before you leave; if you choose to withdraw after the session contact me directly. Any data provided prior to withdrawal from the study will not be included in the analysis. All data provided is confidential.

WHAT WILL BE DONE WITH MY INFORMATION?
All information that you provide will be taken back to Saint Mary's University in Halifax and stored in Dr. Catano's locked laboratory. The data will be retained for 5 years after a report is written. The only people who will have access to the information you provide is the researcher and his supervisor. Individual information will not be shared outside the research team and results will be reported in aggregate (group level) form only. Also, once you have completed your BMQ/BMOQ we intend on matching the results of your survey with your results on your final course report to determine if certain personality characteristics can predict success on your course. We ask that you provide your service number on the final page of the survey in order to make this link. This is the only reason we request your service number. We ensure that all information obtained in this study will be kept strictly confidential. We guarantee that the information you provide will not be shared.

Research Ethics Board Certificate Notice

The Saint Mary's University Research Ethics Board has issued an REB certificate related to this thesis. The certificate number is: _12-045_ .

A copy of the certificate is on file at:

Saint Mary's University, Archives
Patrick Power Library
Halifax, NS
B3H 3C3

Email: archives@smu.ca
Phone: 902-420-5508
Fax: 902-420-5561

For more information on the issuing of REB certificates, you can contact the Research Ethics Board at 902-420-5728/ ethics@smu.ca .