WHAT'S THE PERSONALITY OF A BLANK? AN EXAMINATION OF THE PERSONALITY

DIFFERERENCES BETWEEN REPORTERS

AND NONREPORTERS OF

DEMOGRAPHICS

by

CHLOE J. TATNEY

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ABSTRACT

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Chloe Tatney, M.S.

The University of Texas at Arlington, 2008

Supervising Professor: Mark Frame

The current study examined the measurement equivalence of personality measures between those who report demographic variables (i.e., age, race, and gender) and those who do not report these variables. Measurement equivalence was not established between the two groups, so subsequent analyses of personality differences were interpreted with caution and efforts were made to restore equivalence between the two groups. The Dynamic Factors Survey and the Guilford-Zimmerman Temperament Survey (which were the personality inventories used in the analyses) were mapped onto the Big Five personality dimensions in an effort to generalize findings beyond these specific scales. Once measurement equivalence was restored, no significant mean differences were detected. Practical and theoretical implications will be discussed.

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CHAPTER 1

INTRODUCTION

Organizations seeking to abide by the law and appropriately monitor their assessments and tools for unfairness towards protected class groups can be affected by individuals who fail to report certain demographic information (e.g., gender, race, and age). Oftentimes, the sole purpose for inquiring about these demographic characteristics in an employment setting is to accurately gauge whether or not an employment practice or test is disproportionately favoring one group of people. However, when individuals do not respond to these demographic questions, meaningful data geared towards equality in the workplace is lost. A common assumption about the people who do not report these demographic characteristics is that they are members of protected class groups. Ironically, these demographic questions are asked and monitored to ensure fairness towards the same people who are assumed to not fill them out. When this information is not reported, it can lessen the accuracy of initiatives intended to promote equality. This study seeks to examine the personality variables that may be driving individuals to avoid responding to demographic questions.

"A great majority of the reported litigation cases in the calendar year 2006 focused on employment claims—specifically, discrimination claims based on age, gender and race" (Barber, 2007, p. 36). In fact, the number of discrimination charges filed with the U.S. Equal Employment Opportunity Commission (EEOC) increased slightly in 2006, which was the first increase since 2002, according to the EEOC's annual statistics. The EEOC received a total of 75,768 discrimination charges against private-sector employees in fiscal 2006, with 35.9% being race charges, 30.7% being sex charges, and 21.8% being age charges (Robbins & Grinberg, 2007). With such an exorbitant amount of litigation, it is evident that discriminatory practices still exist in the 21st century workplace despite laws of protection, such as Title VII (1965), the Equal Pay Act (1963), and the Age Discrimination and Employment Act (1991; Gutman, 1993). Consequentially, being a member of a protected class places one in a vulnerable position in an employment setting.

Many organizations use selection processes which inquire about protected class characteristics. Employers often include optional demographic questionnaires on selection tests as a means to determine if their hiring measures demonstrate adverse impact. Adverse impact is defined as "the disproportionate limitation or denial of employment for some protected class group that results from the use of a [seemingly] neutral requirement (i.e., the selection instrument) or practice" (Walsh, 2007, p. 67). In other words, adverse impact is demonstrated if an employment instrument or practice causes members of certain protected class groups to face employment or advancement rejection significantly more than other groups. However, not all respondents answer the optional demographic questions asked during an employment process. Respondents who belong to protected classes may not be persuaded by an employer's claim to verify equal employment and may interpret the demographic questions as personally intrusive and as a means to discriminate. As a result, these respondents may eschew completing these questions. Another possible explanation for why respondents fail to answer these questions may be that some people do not feel obligated to disclose any sort of personal information, and therefore, intentionally skip the demographic questions regardless of whether or not they are members of a protected class. Another explanation could be sheer carelessness; respondents may accidentally skip over the demographic questions without realizing what they have done. Without knowing the answers to the demographic questions left blank, it is difficult to determine why people choose not to respond to these items. Regardless of why people left the demographic questions blank, organizations are deprived of valuable information when questions are left unanswered. Initial research in this area has been informative yet not conclusive (Tatney & Impelman, 2008). It may be that those who avoid demographic questions have a specific personality profile, which is different from those who do report demographics. The present study will examine the personality differences between those who report demographics and those who avoid the questions all together.

1.1 Examining Missing Variables

Previous studies have examined differences between identified and non-identified (or anonymous) individuals pertaining to survey return rate and response patterns (e.g., Butler, 1973; Fischer, 1946; Fuller, 1974; Giles & Feild, 1978; Kerin & Peterson, 1977; Klein, Maher, and Dunnington, 1967; Rosen, 1960). Identified groups were commonly designated as those who provided their signature

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on the survey, and anonymous groups were those who did not provide such a signature. Responses and return rates were then compared between the "identified" and "anonymous" groups. In regards to demographic questions, Giles and Feild (1978) reported that individuals may experience a more subtle fear of being identified by their pattern of responses to such questions. These individuals may, in turn, distort their survey responses to avoid recognition. Some researchers suggest reducing or eliminating demographic data altogether to preserve anonymity on surveys (Wilson & Rosen, 1975). However, this is not practical given APA's requirement of reporting demographic information in publications.

Tacken, Braspenning, and Hermens (2007) examined the differences between those who responded to demographic questions and those who did not on their beliefs about cervical cancer screening. They found that the non-responders to the questionnaire thought they had less risk of cervical cancer, were less motivated, less often intended to get future screening, and were more convinced that cervical cancer cannot be cured.

Other studies have examined if characteristics and responses of non-respondents are comparable to that of respondents (Fiala, 2005; Porter & Whitcomb, 2005). Porter and Whitcomb (2005) assessed what causes a student to participate in a survey. They examined participation across multiple surveys to understand survey non-response and examined how student characteristics such as demographics, engagement, and Holland personality type affected cooperation. Fiala (2005) compared the characteristics for non-responding and responding certified athletic trainers. However, both of these studies examined how demographic characteristics influenced non-response on the survey items, whereas this study seeks to examine how personality affects non-response on the demographic items. The present study extends previous research by examining personality differences between those who report gender, age, and race demographics and those who do not.

A common assumption about people who do not report demographic variables is that they are members of historically discriminated against or marginalized groups (Tatney & Impelman, 2008). A previous study examined these assumptions for age, race, and gender on a cognitive ability test (Tatney & Impelman, 2008). The results supported the assumption that people who do not report gender perform similarly to females and those who do not report age perform similarly to participants over 40. However,

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the assumption regarding those who do not report race performing similar to African Americans was only partially supported.

The current study differs from the aforementioned study, because it seeks to examine the personality differences between those who do not report the demographic variables of age, gender, and/or race (which will hence be referred to as "blanks") and those who do report these demographics (which will hence be referred to as "non-blanks"). However, the current study also relates to the previous study, in that they both incorporate the theoretical background of stereotype threat as a means to elucidate the findings.

1.2 Stereotype Threat

Using the assumption that the "blanks" could be victims of stereotype threat (Tatney & Impelman, 2008), the present study seeks to examine personality differences between the potentially stereotype-threatened "blanks" and the "non-blanks." Stereotype threat exists when a social psychological predicament arises when individuals are faced with a situation where a negative stereotype regarding their in-group is prevalent (Steele, 1997; Steele & Aronson, 1995; Steele, Spencer, & Aronson, 2002). Steele and colleagues have shown that negatively stigmatized groups (such as racial minorities, women, or certain age groups; to name a few) can experience increased levels of anxiety in situations in which their stigma becomes salient (e.g., answering a demographic questionnaire before taking a cognitive ability test; Steele, 1997; Steele & Aronson, 1995; Steele et al., 2002). A form of self-fulfilling prophecy can ensue when this heightened level of anxiety leads to lower performance (Brown & Day, 2006). According to the definition of stereotype threat, when members of certain racial minority groups encounter testing situations, they become reminded of the common finding that their demographic group tends to score lower, on average, than other comparison groups. This awareness leads to concern that they may perform poorly on the test and reinforce the negative stereotype. As a result, their concern detracts from their ability to adequately focus all of their attention on the test, and they perform poorer on the test than they would without this stereotype-driven pressure (Cullen, Hardison, & Sackett, 2004).

Stereotype threat is most acutely felt by those most concerned about their performance on the stereotyped task (Steele, 1998). In other words, those who have more desire to perform well on the task and are motivated to avoid giving credence to negative stereotypes are actually more prone to the effects

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of stereotype threat than those who are less confident in their ability and more apathetic to the social repercussions of reinforcing stereotypes (Davies, Spencer & Steele, 2005; Steele, 1997). Cadinu, Maass, Lombardo, and Frigerio (2006) reported that little is known regarding individual differences in vulnerability to stereotype threat. These authors found that three individual difference variables have been identified that classify minority group members as more or less vulnerable to stereotype threat. The degree to which people identify with the social group to which they belong, how aware people are about the stereotypes that exist against their groups, and how important people view the task in which negative stereotypes exist to be impact a person's susceptibility to stereotype threat.

Schmader (2002) related Social Identity Theory (Tajfel & Turner, 1986) to stereotype threat and argued that stereotype threat should more strongly affect those who highly identify with the target group of the negative stereotype. A possible explanation for why highly identified individuals may succumb to stereotype threat more readily is that they may feel more attached to their group and, consequentially, feel more pressure to disconfirm a negative stereotype than individuals who do not feel a strong identity to the target group (Cadinu et al., 2006).

A second moderating variable, Stigma Consciousness (Brown & Pinel, 2003; Pinel, 2002), is defined as "the degree to which members of negatively stereotyped groups are chronically conscious of their in-group's low status" (Cadinu et al., 2006, p. 184). In other words, this variable measures how aware certain groups are of the negative stereotypes that plague them. Widely-held or well-known stereotypes are generally lasting and powerful (Smith & White, 2002). Therefore, those that are highly aware of their in-group's negative status are more likely to succumb to stereotype threat than those who are less aware of negative stereotypes plaguing their in-group.

The degree of importance that individuals designate to the stereotyped task may also moderate the effects of stereotype threat (Aronson et al., 1999). For example, those who assign a greater degree of importance to performing well on a stereotyped task are more strongly affected by stereotype threat than those who are apathetic about the performance domain (Cadinu et al., 2006).

Cadinu et al. (2006) expanded these individual differences by showing that individuals with an internal locus of control (individuals who attribute their performance to internal forces) are more susceptible to the ramifications of stereotype threat than are those with an external locus of control

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(individuals that attribute their performance to external forces). Research has shown not only that persons with a high internal locus of control are generally more competent and motivated (Rajamohan, 1978), but also that the most vulnerable individuals to the effects of stereotype threat are those who are competent and who care about the performance domain (i.e., those high in internal locus of control; Steele et al., 2002). However, aside from the locus of control dimension, few studies have examined personality differences between those who experience stereotype threat and those who do not. The current study adds to the literature on individual differences by examining the personality differences (as they relate to the Big Five personality dimensions) between the "blanks" (who are assumed to be victims of stereotype threat) and the "non-blanks."

Before assessing mean differences between personality scores of "blanks" and "non-blanks," this study will first establish whether the two groups are equivalent. One often overlooked assumption is that the selection instrument (personality assessment) is measuring the same thing across different respondents. If the personality measure is not equivalent across sources, substantive interpretations of the mean differences may be inaccurate and misleading (Woehr, Bennett, & Sheehan, 2005). This alludes to the necessity of establishing measurement equivalence in a study before drawing conclusions on mean differences.

1.3 Measurement Equivalence

Observed scores from different groups cannot be compared without first establishing measurement equivalence (Drasgow & Kanfer, 1985). Vandenberg and Lance (2000) provide an integrated and synthesized review of the measurement equivalence/invariance literature in organizational research. In their review, the authors elaborate on the importance for increased application of measurement equivalence techniques before hypotheses are tested. The establishment of measurement equivalence is a logical prerequisite to the evaluation of substantive hypotheses regarding group differences. Vandenberg and Lance's (2000) recommended approach regarding assessing measurement equivalence (ME) is to use Confirmatory Factor Analysis (CFA) procedures in a series of hierarchically nested models. The authors note that, classical test theory has historically reigned in the interpretations of measurement quality (Crocker & Algina, 1986; Nunnally & Bernstein, 1994). However, they also note that classical test theory methods are not sufficient to examine ME, and therefore should not be used. Another

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popular approach, besides using CFA, to examining ME is based on item response theory (Raju, Laffitte, & Byrne, 2002). Diefendorff, Silverman, and Gregarus (2005) note that Vandenberg and Lance's (2000) approach to ME, which involves using CFA procedures in a series of nested models, may be better than other approaches due to its comprehensive and integrated nature. Thus, heeding their advice, the Vandenberg and Lance (2000) approach of hierarchically nested models was used to test measurement equivalence for the current study.

Before reviewing the series of hierarchically nested models, it is necessary to distinguish between conceptual and psychometric equivalence. Conceptual equivalence ensures that groups view an instrument similarly and that both groups are in agreement as to the conceptual framework of the constructs (Cascio & Aguinis, 2005; Cheung, 1999). More specifically, conceptual equivalence will be established between "blanks" and "non-blanks" if both groups have the same number of underlying personality factors, the specific items load on the same factors, and the item loadings are comparable in magnitude. This finding would show that both groups are interpreting the personality assessment, including the latent constructs, in the same way. Establishing conceptual equivalence is a prerequisite to assessing psychometric equivalence. Psychometric equivalence indicates that the different respondents reply to the instrument in the same way. This is evidenced by comparable levels of reliability, variance, range of ratings, mean level of ratings, and intercorrelations among factors (Cascio & Aguinis, 2005; Cheung, 1999). Conceptual equivalence is a prerequisite to psychometric equivalence, because it establishes that the two groups are invariantly viewing the construct, and thus allows for further analysis of the specific response patterns and psychometric properties. However, an absence of psychometric equivalence is not necessarily a cause for alarm. It may indicate meaningful differences between respondents from different groups. Some researchers claim that psychometric non-equivalence can signify that response biases (e.g., central tendency) may be inherent in one of the groups in question (Bollen, 1989; Diefendorff et al., 2005).

Vandenberg and Lance (2000) suggest a sequence of seven nested tests of measurement equivalence. The first two tests address the idea of conceptual equivalence, and the final five tests examine psychometric equivalence. Each test will be reviewed in depth; however, this study will focus on the tests of conceptual equivalence due to the fact that psychometric differences are expected. A

common first step to assessing ME is to perform an omnibus test of the invariance of covariance matrices across the two groups under examination (Vandenberg & Lance, 2000). It can be concluded that ME exists between the groups if the two groups have virtually identical covariance matrices (Schaubroek & Green, 1989). However, Meade and Lautenschlager (2004) describe how "some authors have questioned the usefulness of this particular test on the grounds that this test can indicate that ME is reasonably tenable when more specific tests of ME find otherwise" (p. 363). Therefore, a series of nested model chi square difference tests needs to be performed to determine where possible differences lie. Because the purpose of measurement equivalence is to show that two groups are invariantly viewing the personality measure, failing to reject the null hypothesis is optimal.

Configural invariance is the first test in a series of nested models in the equivalence hierarchy, which asks the question, do "blanks" and "non-blanks" agree on the factor structure? Configural invariance is the least restrictive and the weakest (Cole, Bedeian, & Feild, 2006) test, because the only purpose it serves is to identify an equivalent factor structure between groups. Finding support for the null hypothesis, which also supports the assumption of ME, would imply two things. First, it would mean that "blanks" and "non-blanks" were viewing the personality measure with the same conceptual framework. Due to the fact that configural invariance is a prerequisite to all other tests of ME, another implication is that the further tests of additional aspects of ME may proceed. If configural invariance is not established, this finding would suggest that the two groups are dissimilarly viewing the personality constructs, and thus an examination of observed mean differences may be influenced by the non-equivalence, potentially yielding spurious results (Vandenberg & Lance, 2000).

The second test provides a test of metric invariance (Horn & McArdle, 1992), which asks the question, do specific items load onto factors in the same way? In other words, metric invariance is demonstrated if the specific items load onto the personality factors in a similar fashion for both "blanks" and "non-blanks." Two groups may have configural invariance if they agree on the factor structure of the personality assessment, but can demonstrate a lack of metric invariance if they disagree on which items belong to a certain factor (Diefendorff et al., 2005). At least partial metric invariance must be established for subsequent tests to be meaningful (Vandenberg & Lance, 2000).

If both configural invariance and metric invariance are established, then the measure is said to have complete conceptual equivalence between the two groups (Diefendorff et al., 2005). Reise, Widaman, and Pugh (1993) suggest that having conceptual equivalence is sufficient for examining mean differences between groups, even if subsequent tests reveal that the two groups are psychometrically non-equivalent. The next five tests converge to assess psychometric equivalence. This form of equivalence determines if the two groups have similar response patterns. Because the present study is investigating differences in personality patterns between "blanks" and "non-blanks," psychometric equivalence is less of a concern, and some of these tests will not be performed. However, each of the tests will be explained and reasons for why they will or will not be used will be clarified. Even if it is found that two groups (blanks and non-blanks) are not psychometrically invariant, subsequent examinations of mean differences are still permissible (Diefendorff et al., 2005; Reise, Widaman, & Pugh, 1993).

The third test is a test of scalar invariance (Meredith, 1993), which asks the question, do the observed means differ between groups? This test will determine whether the two groups are responding similarly to the personality items. This test will not be performed as part of the ME analysis in the present study but will be examined using multivariate analysis of variance (MANOVA) techniques. Because mean differences are often expected, many researchers fail to perform this test of ME (Vandenberg & Lance, 2000).

The fourth test is a test of the equality of the unique variances (and possibly covariances) across groups, which asks the question, are the sources of error the same across groups? In other words, this test will examine the equivalence of reliability between "blanks" and "non-blanks." Because unique variances are associated with measurement error (Diefendorff et al., 2005), reliability is a direct inverse function of this error. If equality of the unique variances is established, this suggests that the error associated with the items is equivalent across groups. This test will be performed and the current study expects to find equal error variance across groups, thus establishing that the mean differences represent meaningful differences in personality as opposed to statistical artifacts associated with non-systematic error.

The fifth test is the test of equal factor variances, which asks the question, do the groups have similar variances across latent factors? Specifically, this test examines if the two groups are responding to

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a similar range of the response options on the personality assessment. If the equality of the unique variances test is not substantiated, then that means that the variance of personality factors in one group is significantly different than the variance of personality factors for the other group (Vandenberg & Lance, 2000). Again, in the present study this test will be explored in the MANOVA rather than the ME analyses.

The sixth test is the test of equal factor covariances, which asks the question, do the groups have similar covariances across latent factors? The reason for performing this test has been disputed, and it has been suggested that this test adds little information for the overall assessment of ME (Vandenberg & Lance, 2000). Therefore, this test will not be used in the current study.

The seventh and final test is the test of equal factor means, which asks the question, do the latent means differ across groups? This test differs from the test of scalar invariance, because it examines equivalence between latent means, whereas scalar invariance looks at observed means. A finding of non-equivalence in this test suggests that the two groups answering items at different levels of the latent construct (Diefendorff et al, 2005). As was previously stated, for the current study, this test will be examined in the MANOVA rather than ME analyses.

Collectively, these nested model chi-square difference tests represent a comprehensive framework through which to examine the measurement equivalence of different groups across different personality scales (Diefendorff et al., 2005). Findings that support the assumption of measurement equivalence add justification to the subsequent examinations of differences between latent or observed means.

1.4 Personality Differences

Establishing measurement equivalence between the two groups allows the researcher statistical permission to probe the mean differences in personality between "non-blanks" and "blanks." This portion of the present study will investigate the personality differences between "blanks" and "non-blanks." The current study seeks to answer this research question by assessing differences between these two groups on the Dynamic Factors Survey (DFS; Guilford, Christensen, & Bond, 1954) and the Guilford-Zimmerman Temperament Survey (GZTS; Guilford, Zimmerman, & Guilford, 1976), which are personality inventories included in an assessment process implemented by Batrus Hollweg International. To enhance the extent

to which these findings will generalize beyond the DFS and the GZTS, the measures will be compared to and mapped onto the Big Five dimensions of personality.

<div align="center">1.4.1 Big Five Personality Factors</div>

Personality traits used in the workplace are defined as "individual difference characteristics that are important and powerful in explaining human behavior in the world of work" (Dilchert, Ones, Van Rooy, & Viswesvaran, 2006). In other words, personality traits describe the internal characteristics that drive individual's behavior. A plethora of personality characteristics can be used to describe individuals and distinguish them from one another; however, a more succinct and comprehensive structure exists to condense and synthesize this myriad of possibilities into a more parsimonious framework. Accumulated evidence examining how various personality characteristics relate to one another suggests that virtually all personality measures can be reduced or categorized under the umbrella of a five-factor model of personality. The five-factor model is commonly referred to as the "Big Five" dimensions of personality (Costa & McCrae, 1992; Digman, 1990; Goldberg, 1990).

The history of the Big Five traces back to Galton (1884), who was the first to propose the lexical hypothesis. This idea claims that the most important characteristics of individuals will be captured in the words that people use to describe each other. To test this hypothesis, Galton used a thesaurus to classify and categorize words that were said to describe personality. Allport and Odbert (1936) also used Galton's lexical approach and identified over 17,000 words in the dictionary that were descriptions of personality. In the 1940s, Cattell examined these trait descriptive words and reduced them to 35 traits (Dilchert et al., 2006). A massive effort by researchers took place in the 1940s and 50s to factor analyze the broad list of personality factors down to a manageable, yet inclusive number (Dilchert et al., 2006). The researchers credited with this success are Tupes and Christal (1961), who found five replicable personality dimensions in ratings of human personality. Norman (1963) confirmed the five factor structure of personality descriptors. Lewis Goldberg (1990) can be credited for coining the term "Big Five." The dimensions captured by the Big Five include: emotional stability, extraversion, agreeableness, conscientiousness, and openness to experience (Goldberg, 1993). Dilchert et al. (2006) defined these factors as follows:

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1. *Emotional stability* refers to an individual's tendency to become emotionally upset. It characterizes individuals in terms of their proneness to experience emotional distress and maladaptive coping strategies.

2. *Extraversion* describes a person's tendency to seek interpersonal stimulation and capacity for joy. It encompasses traits relating to sociability, dominance, energy, and positive affect.

3. *Agreeableness* includes characteristics such as likeability, kindness, courteousness, and nurturance.

4. *Conscientiousness* refers to the cluster of traits relating to prudence, achievement, dependability, persistence, order, and impulse control.

5. *Openness to experience* describes individual differences in tolerance for and an attraction to the unfamiliar. Traits commonly associated with this dimension include imagination, curiosity, originality, broadmindedness, and intelligence.

Table 1 lists characteristic traits at the high and low end of each of the five factors.

Personality psychologists still disagree on the framework of personality traits even though a vast majority of literature supports the utilization of the Big Five personality dimensions (Dilchert et al., 2006). However, despite these opponents, the Big Five model of personality is the most widely used taxonomy in personality research (Hough, 2001; Rothstein & Goffin, 2006). Because of the widespread acceptability and generalizability of these five factors, the present study seeks to empirically map the existing personality scales onto the Big Five personality dimensions.

There is a paucity of existing literature examining the link between the Big Five personality dimensions and stereotype threat. Sawyer and Hollis-Sawyer (2005) examined three models of stress appraisal and coping that can be applied to a testing context. One was the personality trait model, which suggests that people may experience stress in the testing situation because of personality characteristics (e.g., high neuroticism; Costa & McCrae, 1998). The authors noted that test anxiety is related to two anxiety traits, dispositional worry and emotionality (Flett & Blankstein, 1994; Hocevar & El-Zahhar, 1988; Williams, 1994; Zeidner & Nevo, 1992). Worry can be associated with the Big Five dimension of Neuroticism (Hocevar & El-Zahhar, 1988) and emotionality is related to Extraversion (Williams, 1994).

However, the authors' objectives were to empirically test three theoretical models of stress appraisal and coping that may be applied to a testing context. The Sawyer and Hollis-Sawyer (2005) study is only loosely related to the current study, because the present study examines the personality differences of those assumed to undergo stereotype threat versus those who are not, whereas Sawyer and Hollis-Sawyer (2005) sought to explore the individual differences between stress appraisal and coping. Since existing literature pertaining to this subject is scarce and only peripherally related to the current study, it cannot truly serve as a foundation of which to derive hypotheses. Moreover, due to the lack of direct links to previous research, this research was more exploratory in nature. On that note, the current study addressed two overarching research questions.

Research Question 1: Does measurement equivalence exist between "blanks" and "non-blanks?"

Research Question 2: Are there personality differences between "blanks" and "non-blanks?"

To answer these research questions, archival data from an on-going selection process was utilized. The selection process is comprised of a cognitive ability component (which measures quantitative and verbal ability) and a personality component. Previous research using this archival dataset has demonstrated that "blanks" perform similarly to the marginalized groups on cognitive ability, and therefore, may be members of these negatively stereotyped groups (Tatney & Impelman, 2008). This previous research used stereotype threat as the theoretical background to explain these differences between groups and from which to draw conclusions. The present study seeks to extend previous research by examining the personality component of this selection process.

CHAPTER 2

METHOD

This study was originally developed and implemented as a two phase study, with the first phase empirically mapping the existing personality scales onto the Big Five factors of personality, and the second phase examining measurement equivalence and mean differences between "blanks" and "non-blanks" on personality. The reader will notice, however, that based upon the findings of the original study, a modified version of the scales used was created and the original analyses were re-conducted using the modified scales. The creation of the modified personality scales and repeated analyses using these modified scales was added as Study 2. The following sections depict the analyses and findings of these two studies.

CHAPTER 3

STUDY 1

3.1 Phase One

The first step of the present study mapped the DFS (Guilford et al., 1954) and the GZTS (Guilford et al., 1976) personality scales onto the Big Five personality dimensions. Phase one was conducted to ensure that the results and findings of the present study would generalize beyond the specific scales used in Phase Two. An online survey containing the DFS (Guilford et al., 1954), the GZTS (Guilford et al., 1976), and the Big Five Inventory (BFI; John, Donohue, & Kentle, 1991) was constructed and posted to the University's SONA website. Items of the BFI are listed in Appendix A, and items for the DFS and GZTS are listed in Appendix B.

3.1.1 Phase One Participants

The participants for Phase One were 300 undergraduate students enrolled in psychology courses at the University of Texas at Arlington. Of the 300 participants, the majority were females (with 71% being females and 29% being males) and under 25 years old (with 91% being under 25 years old and 9% being over 25 years old). The racial breakdown of the participants was as follows: 11% were Asian, 19% were Black, 14% were Hispanic, 50% were White, and 6% were classified as other races. Participants were able to complete the online survey, "Do You Have Personality" at their own convenience. Students received one hour of course credit for their participation in the online survey.

3.1.2 Phase One Analysis

After the data were collected, subscale scores for the DFS (Guilford et al., 1954), the GZTS (Guilford et al., 1976), and the BFI (John et al., 1991) were computed for each participant. Scale reliabilities were computed and compared to existing research. Correlations were calculated between the Big Five personality dimensions (scales) and the subscales of the other two measures using SPSS. This

mapping process enhances this study by increasing the generalizability of the results. After completing

the analysis for phase one, the analysis for the present study was conducted.

3.2 Phase Two

The second step of the study compared the personality characteristics of "blanks" to those of

"non-blanks" using the DFS (Guilford et al., 1954), and GZTS (Guilford et al., 1976). Measurement

equivalence was first assessed to ensure the groups were comparable. Upon completion of the

measurement equivalence procedures, mean differences between "blanks" and "non-blanks" were

examined.

3.2.1 Phase Two Participants

The data to be used in Phase Two of this study was obtained from an existing data source

provided by Batrus Hollweg International (BHI). The personality measures used for Phase Two were the

DFS (Guilford et al., 1954) and the GZTS (Guilford et al., 1976). Variations of these two personality

measures are included in two of BHI's assessment products, Performance View™ and Performance

Plus™. The participants included in the data set completed the assessment process (which includes the

personality inventories under examination as well as a cognitive ability portion) between January 2006

and July 2007. This assessment was taken by managers predominately in the restaurant industry for

potential employment or advancement purposes. The original sample of targets contained a total of

12,991 managers. "Blanks" were classified as participants who leave gender, race, and/or age

unanswered. The total number of "blanks" included in this dataset after data screening was 620. Due to

the extreme difference in N-size for between the two groups, 620 "non-blanks" were randomly selected

from the entire pool of "non-blanks." Of those who did report their gender, age, and race; 74% were male

and 26% were female, 75% were under 40 years of age and 25% were over 40 years of age, and 79%

were White and 21% were minorities. Of those who did not report gender, age, and/or race; 47% left all 3

demographic variables blank, 20% left only age blank, 16% left only race blank, 8% left only gender

blank, 3% left gender and age blank, 6% left race and age blank, and 1% left gender and race blank.

3.2.2 Phase Two Measures

The personality assessment used in this study was extracted from the Performance View™ and

Performance Plus™ assessment products offered by BHI. These two assessment products guide the

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selection and development of managers, administrators, and professional individual contributors, primarily in the restaurant sectors. Other sectors covered include manufacturing, transportation, and hospitality. The same measures of mental ability and personality form the foundation for both of the instruments offered (Batrus Hollweg International, 2005). For the purpose of this study, the personality portion of these assessments was the only area examined. The two personality surveys included in the assessment are the DFS (Guilford et al., 1954) and the GZTS (Guilford et al., 1976).

The DFS, which was formerly referred to as the Dynamic Factors Opinions Survey (DFOS), was actually a by-product of a comprehensive factor-analytic investigation of interests. Items for each factor were selected for inclusion in the DFS based on item analysis. Through factor analysis techniques; Guilford, Christensen, and Bond (1954) determined that selected scores loaded heavily onto certain factors. Interests were defined basically as dimensions of motivation (Guilford et al., 1954).

The DFS scales used in the Performance View and Performance Plus assessments include 5 of the original 10 DFOS factors: Liking for Thinking, Self-Reliance, Need for Freedom, Need for Diversion, and Realistic Thinking. Someone high in Liking for Thinking enjoys mathematical thinking, logical problems, and planning; someone low in this trait dislikes mathematical thinking, logical problems, and planning. An individual high in Self-Reliance is described as independent, responsible, and dependable; someone low in this trait is often dependent, subservient, and seeks support. Someone high in Need for Freedom could be described as a nonconformist, because they dislike system and order, whereas someone low in this trait likes order, system, and organized life and accepts controls. An individual high in Need for Diversion craves amusement, likes to play, and is inclined to romanticism; someone low in this trait has little need for recreation and is not playful or interested in amusements. Someone high in Realistic Thinking takes a realistic view of themselves, has a matter-of-fact attitude, and is forthright and direct; someone low in this trait is prone to wishful thinking, appreciates humor, and expresses hostility indirectly (Batrus Hollweg International, 2005; Guilford et al., 1954).

Each of the five DFS scales consists of 15 items, resulting in a 75 item test. Individuals respond with a "yes", "no", or "?" response to each item, while the test instructs the test taker to avoid making too many inconclusive ("?") responses. Each response receives a "1" or a "0" score which is then added to

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establish a scale and overall total score, with higher scores indicating that a certain individual is more likely to behave in accordance with the respective scale.

DFS reliability information for a random sample of 100 male and 100 female college students is provided in Table 2 (Guilford et al., 1954). Reliability coefficients were derived by correlating odd and even scores on the instrument and applying the Spearman-Brown formula, which is used to estimate the reliability increase if the number of items is increased. Estimates were made for men and women separately and for the two combined.

The DFS test manual reports that the DFS scales were derived through a large scale factor analysis on 720 U.S. Air Force cadets, Reserve Officer Training Corps members, and Officer Candidate School students (Guilford et al., 1954). However, specific correlations between DFS scales and measures of job or contextual performance were not included in the manual (Batrus Hollweg International, 2005).

The GZTS has been used in educational, vocational, marital, and personnel counseling as well as in personnel evaluation, selection, and placement, for more than a quarter century (Guilford et al., 1976). The GZTS measures 10 scales which include: General Activity, Restraint, Ascendance, Sociability, Emotional Stability, Objectivity, Friendliness, Thoughtfulness, Personal Relations, and Masculinity. The traits measured by the GZTS are described in detail in Table 3.

Eight of the ten GZTS scales contain 15 items (General Activity, Emotional Stability, Objectivity, Friendliness, Sociability, Thoughtfulness, Personal Relations, and Masculinity). The remaining two scales (Restraint and Ascendance) contain 20 items, for a total of 160 items. Consistent with the DFS, individuals respond with a "yes", "no", or "?" response to each item, while the test instructs the test taker to avoid making too many inconclusive ("?") responses. Each response receives a "1" or a "0" score which is then added to establish a scale and overall total score, with higher scores indicating that a certain individual is more likely to behave in accordance with the respective scale.

Studies examining the reliability of the GZTS scales have demonstrated that the measure is significantly consistent. The reliability coefficient (Cronbach's alpha) of each scale appears in Table 4 following the scale name, computed on a sample of 523 males and 389 females (Guilford, Guilford, & Zimmerman, 1978).

Like the DFS, the GZTS was also developed through factor analytic methods. Inter-item correlations and total score correlations provide evidence of construct validity. Several studies describe analyses verifying the traits of the GZTS. A summary of these studies is provided by Guilford et al. (1978) and Guilford et al. (1976). Results from Guilford et al. (1976) reviews 23 separate factor analyses and shows support for the GZTS scales protruding as unique factors in each instance. Inter-correlations among GZTS scales further confirm the uniqueness of the information provided by each factor. "Among these intercorrelations, 70% are below .30, while those above can be attributed to higher order factors. Even the highest correlations leave much room for discriminating among individuals" (Batrus Hollweg International, 2005, p. 15). In other words, the low inter-correlations between the scales signify that each scale is measuring something unique, and cases where scales are correlated to a greater extent than .30 may be attributable to higher order factors. Divergent validity was also evidenced when analyses compared the GZTS factors to seemingly dissimilar variables. The results consistently showed the GZTS factors having little similarity to unrelated variables (Batrus Hollweg International, 2005).

Convergent validity was also determined in a number of studies (Guilford et al., 1978). This form of validity was evidenced by high correlations between the GZTS factors and scales from other instruments claiming to measure the same constructs. Many instruments have shown a significant relation to the GZTS, yet the most notable similarities have been with the Thurstone Temperament Schedule and the Comrey Personality Scales. As was previously mentioned, divergent validity was also demonstrated between the GZTS scale and unrelated traits. Some of the most noteworthy instruments used to investigate divergent validity have been the Minnesota Multiphasic Personality Inventory, the Sixteen Personality Factor Questionnaire, the California Psychological Inventory and the Comrey Personality Scales.

In reference to predictive validity, the GZTS has been shown to predict success in occupations ranging from assemblers to company president. For managerial positions, Ascendance, Sociability, and General Activity have emerged as important predictors of success in over three different studies (Grimsley & Jarrett, 1973, 1975; Harrell, 1972; Scholl, 1957). Additionally, four scales of the GZTS (Ascendance, Sociability, General Activity, and Personal Relations) have been linked to success in sales

positions (Campbell, Otis, Liske & Prien, 1962; Finkle & McCabe, 1956; Guion, 1965). Several other studies provide additional support in this area (Batrus Hollweg International, 2005).

3.2.3 Phase Two Analysis: Measurement Equivalence

To examine the nested tests of measurement equivalence, the present investigation used LISREL 8.20 (Joreskog & Sorbom, 1996). The tests that were examined were configural invariance, metric invariance, and equality of the unique variance. Following the Vandenberg and Lance's (2000) procedure, overall model fit was assessed via a variety of indices. Their first recommendation is to use the chi-square (χ^2) statistic. Wheaton, Muthen, Alwin, and Summers (1977) also suggest using the (χ^2) /degrees of freedom ratio, because it ameliorates the (χ^2) index's sensitivity to sample size. However, these chi-square statistics alone are not sufficient to adequately determine measurement equivalence and are best used in conjunction with other practical fit indices (Bollen & Long, 1993). Thus, again following Vandenberg and Lance's (2000) recommendation, the following fit indices were used in the present study:

> (a) Tucker Lewis Index (TLI) which is identified in LISREL as the non-normed fit index (NNFI; Tucker & Lewis, 1973)
>
> (b) Root Mean Square Error of Approximation (RMSEA; Steiger, 1990; Steiger & Lind, 1980)
>
> (c) Standardized Root Mean Square Residual (SRMR; Bentler, 1995)
>
> (d) Comparative Fit Index (CFI; Bentler, 1990)
>
> (e) Normed Fit Index (NFI; Bentler & Bonnett, 1980).

Hu and Bentler (1999) recommend the following standards for evaluating model fit: CFI=.95, NNFI=.95, RMSEA=.06, SRMR=.08. However, based on their extensive research with measurement equivalence in organizational research, Vandenberg and Lance (2000) suggested that this recommendation may be too stringent. As an alternative, they suggest the lower bound of good fit for the NNFI, CFI, and NFI to be .90. For the RMSEA and the SRMR, they report that values smaller than .05 are indicative of good fit, and values of .08 represent an upper bound for acceptable fit (Browne & Cudeck, 1992).

To analyze the various types of equivalence, Diefendorff et al. (2005) recommend constraining parameters to be equal across the two groups for each ME test. To determine if there is a significant

difference between the model that is constrained to be equal across groups and the less constrained model, χ^2 statistics (along with the overall fit indices) were examined. Appropriate model fit was determined by the previously mentioned standards recommended by Vandenberg and Lance (2000).

3.2.4 Phase Two Analysis: Mean Differences

An examination of mean personality differences between "blanks" and "non-blanks" was conducted after the degree of measurement equivalence was established between the two groups. As was previously mentioned, observed scores from different groups cannot be compared without first establishing measurement equivalence (Drasgow & Kanfer, 1985). An exploratory analysis into the differences in personality between the two groups was performed to address the research question. To test the research question, a multivariate analysis of variance (MANOVA) was performed in SPSS. The 15 personality scales served as the dependent variables and participant status ("blank" or "non-blank") served as the independent variable. Levene's test for equality of variances was performed on all the variables of interest. The mean difference was established significant at a .05 level. Since the research question is exploratory in nature, no predictions were made as to how the results should unfold.

CHAPTER 4

STUDY 1 RESULTS

As stated previously, the reader will find that the results were not as expected. Specifically, measurement equivalence was not established in Phase Two, and the lack of equivalence was later found to be the result of a personality scale with psychometric flaws. Therefore, efforts were made to ameliorate the psychometric properties of the personality scale by analyzing each item individually and removing poorly functioning items from the analysis. This procedure resulted in a modified version of the DFS and GZTS scales. All analyses were re-examined in a second study using the modified version of the DFS and GZTS scales. Before reviewing the analyses involving the modified version of the DFS and GZTS scales, a review of the results of the initial analyses with the original DFS and GZTS scales will be given.

4.1 Phase One

This phase of the study sought to examine the extent to which the DFS (Guilford et al., 1954) and the GZTS (Guilford et al., 1976) mapped onto the Big Five dimensions of personality as measured by the BFI (John et al., 1991). The data were screened prior to analysis. No transformations were made due to acceptable levels of skewness and kurtosis. No extreme outliers were detected so no data points were deleted. The total sample size used in the analysis included 300 participants.

After recoding all necessary items and calculating subscale scores for each participant, reliability analyses were undertaken. Table 5 displays the internal consistency reliability coefficients for the Phase One participants compared to existing research. The results show very little difference in the reliability coefficients found in the present study and those found in previous literature.

Next, correlational analyses were performed between the scales of the DFS and GZTS and the scales of the BFI. Due to the fact that no existing literature gives a definitive criterion value for which to measure satisfactory convergent validity, the criterion determined for acceptable linkage to a Big Five

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dimension was determined *a priori*. This *a priori* determination criterion required that the significance value of the correlation coefficient between the DFS and GZTS scales be .30 or higher. The empirical mapping was decided as the highest relationship observed between the DFS and GZTS scales and the Big Five scales. Byrne and Goffin (1993) consider a correlation of 0.50 or greater to be a large correlation, so it was deduced that 0.30 would be considered the lower bound for a moderate (and sufficient) correlation. Thus, any values lower than 0.30 were not considered, regardless of statistical significance.

Each scale's resultant mapping (according to the criterion described above) will be briefly discussed. The GZTS scales will be reviewed first. The Drive and Energy scale was found to be most closely related to Extraversion ($r = .53$), Self-Discipline was most closely related to Conscientiousness ($r = .40$), Emotional stability was closely related to Neuroticism ($r = -.66$), Objectivity was most closely related to Neuroticism ($r = -.50$), Assertiveness was most closely related to Extraversion ($r = .60$), Sociability was most closely related to Extraversion ($r = .72$), Thoughtfulness was most closely related to Openness to Experience ($r = .53$), and Masculinity was most closely related to Neuroticism ($r = -.34$). No empirical mappings were determined for Friendliness and People Relations due to the fact that none of their correlations with the Big Five dimensions reached the minimum requirement of 0.30.

Next, the results of the DFS scales will be reviewed. Liking for Thinking was most closely related to Openness to Experience ($r = .31$), Self-Reliance was most closely related to Neuroticism ($r = -.34$), Need for Freedom was most closely related to Conscientiousness ($r = -.36$), Realistic Thinking was most closely related to Openness to Experience ($r = -.33$), and Need for Diversity was most closely related to Openness to Experience ($r = .34$). Table 6 displays the results of the correlational analyses.

The mappings determined by this phase of the study aligned closely with the mappings established by previous researchers (Hough & Ones, 2001). In fact, almost all the GZTS scale mappings matched those of previous researchers. Aside from the two scales (Friendliness and People Relations) that were found to insufficiently map onto a Big Five scale, Masculinity was the only scale that did not match previous researcher's mappings. Hough and Ones (2001) report that Masculinity is better represented as a scale of its own rather than as a mapping to the Big Five personality scales. Three out

of the five DFS scales correctly matched up with previous literature. Self-Reliance and Need for Diversity map onto Big Five dimensions differently for the current study than it did for previous researchers.

4.2 Phase Two

The next portion of the study examined the mean differences between "blanks" and "non-blanks" on personality scores. However, an examination of measurement equivalence preceded any analysis of mean differences. The three tests of measurement equivalence that were tested were configural invariance, metric invariance, and equality of unique variances. This analysis was performed using hierarchically nested models in LISREL 8.20 (Joreskog & Sorbom, 1996). For each test of measurement equivalence, models between the two groups were constrained to be equal and chi-square difference tests between the constrained model and the actual model were calculated and examined for non-significance, which would signify an equivalent structure between groups. Fit indices were also examined to determine appropriate model fit. The results of each of these tests for each of the 15 personality scales are displayed in Table 7. Contrary to expectations, the results show a lack of measurement equivalence for each of the scales. Non-equivalence is evidenced by significant chi-square values as well as unacceptable values in the fit indices. The finding of non-equivalence suggests that subsequent analyses of mean differences should be interpreted with caution. Any mean differences found between "blanks" and "non-blanks" may be a result of the non-equivalence rather than actual differences between the two groups.

A multivariate analysis of variance (or MANOVA) was used to test mean differences. All assumptions associated with the MANOVA were examined prior to analysis. Hotelling's Trace revealed significant differences between "blanks" and "non-blanks" on personality, $F(15, 1248) = 2.12$, $p < .01$ with partial eta squared = .025. The significance in this omnibus test allowed for further examination of the differences at the scale level.

The test of between-subject effects showed that three of the thirteen personality scales significantly distinguished between "blanks" and "non-blanks." The three scales were Liking for Thinking, $F(1, 1238) = 5.44$, $p < .05$; Drive and Energy, $F(1, 1238) = 5.40$, $p < .05$; and Masculinity, $F(1, 1238) = 13.57$, $p < .001$. An examination of the estimated marginal means showed that "blanks" (M=10.3, SE=.132) scored significantly lower than "non-blanks" (M=10.8, SE=.132) on the personality scale of

Liking for Thinking. Similarly, for the scale of Drive and Energy, "blanks" (M=11.1, SE=.101) scored significantly lower than "non-blanks" (M=11.4, SE=.101). Also, for the scale of Masculinity, "blanks" (M = 9.2, SE = .119) scored significantly lower than "non-blanks" (M = 9.9, SE = .119). Again, due to the lack of measurement equivalence, these mean differences should be interpreted with caution.

Relating these results back to the results of Phase One, predictions can be made about how closely these personality differences correspond to the Big Five personality dimensions. The results for Liking for Thinking were mapped to the Big Five dimension of Openness to Experience, Drive and Energy was mapped to the Big Five dimension of Extraversion, and Masculinity was mapped to the Big Five dimension of Neuroticism. However, in the case of Masculinity, the scale was viewed as a stand alone scale rather than as a mapping to a Big Five personality dimension as was suggested by previous researchers (Hough & Ones, 2001). The marginal means show that "blanks" score significantly lower on the dimensions of Extraversion, Openness to Experience, and Neuroticism than "non-blanks."

CHAPTER 5

STUDY 1 DISCUSSION

The purpose of the present study was to identify if personality differences exist between those

who report the demographic variables of gender, race, and age and those who do not. The current study

also sought to establish measurement equivalence between the two groups before examining mean

differences. However, the personality scale demonstrated non-equivalence across the two groups.

Multiple analyses of measurement equivalence were performed between like groups, and non-

equivalence resulted each time. In addition, confirmatory factor analysis techniques were performed with

an isolated group (rather than comparing the two groups), and model fit was still insufficient. It was then

determined that the scale is inherently flawed, and it is likely that the reason equivalence does not exist

between the "blanks" and "non-blanks" is because the scale is not psychometrically sound. An additional

study was conducted in an attempt to modify the scale by analyzing each item individually. Before

reviewing the results of Study 2, the results of the MANOVA (which were advised to be interpreted with

caution) will be discussed. Using the original scale data, three scales (Liking for Thinking, Drive and

Energy, and Masculinity) demonstrated a significant difference between "blanks" and "non-blanks."

Because the same dataset was used for the current research and previous research that examined

assumptions about "blanks," the conclusion that "blanks" could be members of the marginalized groups

(Tatney & Impelman, 2008) also relates to the current implications.

Liking for Thinking was found to be closely correlated to the Big Five dimension of Openness to

Experience. Results showed that "blanks" scored lower on this dimension than "non-blanks." This

suggests that people who do not report demographics may be less accepting of new experiences or

ideas. Within this context, the distinction between "blanks" and "non-blanks" seems very plausible. Since

this assessment was in an employment setting, people who feel that revealing their demographic

information may negatively impact their chances of employment or advancement may think it wiser to

avoid answering these questions. This interpretation suggests that "blanks" may be more skeptical of how the organization will use this sort of information in the hiring process, and therefore less willing to openly disclose personally intrusive information such as demographic questions. This supports the assumption that people who do not report these demographic variables may, in fact, be members of the subordinate or historically discriminated groups as was suggested by Tatney and Impelman (2008). Due to the nature of this study, however, no data was collected regarding why participants left the demographic questions blank.

The aforementioned findings could also be explained in light of previous research findings (Tatney & Impelman, 2008) which demonstrated that "non-blanks" performed higher on cognitive ability measures. Specifically, it could also be the case that persons performing higher on cognitive ability measures understand more about why organizations are collecting the demographic information and how it will be used. Thus, they are willing to provide the information. Their "blank" counterparts however, who score lower on cognitive ability, lack a full appreciation for why and how the demographic information will be used, and thus do not provide it. This alternative explanation also fits with the present findings that "non-blanks" score higher on the Liking for Thinking dimension than the "blanks."

The finding that "blanks" score lower on Openness to Experience than "non-blanks" also relates back to stereotype threat (Steele & Aronson, 1995). Stereotype threatened individuals may not want to put themselves in situations were their demographic characteristics and, hence, any negative stereotypes associated with these characteristics become salient. Therefore, they will be less open to new experiences that involve revealing this sort of information (e.g., filling out a demographic questionnaire before taking an online assessment). Contrarily, individuals who do not feel such a pressure to avoid being associated with negative stereotypes will be more open to new experiences and will be more willing to go along with all the steps in the process, which includes disclosing demographic information. However, because participants in this study could not be contacted for further questioning, it cannot be determined whether they considered taking an online assessment to be a new experience.

The next scale, Drive and Energy, was highly correlated with the Big Five dimension of Extraversion. The results showed that "blanks" scored significantly lower than "non-blanks," which suggests that "blanks" are less extraverted than "non-blanks." Specifically, this dimension of personality

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as measured by the GZTS has been linked to the facet of Activity/Energy under the dimension of Extraversion (Hough & Ones, 2001). Relating this discrepancy in scores between "blanks" and "non-blanks" back to the assumptions about people who do not fill out demographic questions is less clear in this case. A possible explanation could be that those over 40 years of age may comprise the age "blank" group, and this group of people may feel like they have less energy than they did in their younger years. As people grow older, they experience physiological changes that cause their energy and activity levels tend to decline. Conversely, those under 40, who do not experience stereotype threat effects, may report having higher Activity/Energy levels due to their youthfulness. Previous research has shown that older adults score lower than younger adults on the dimension of Extraversion (Hester & Brown, 1980), and this distinction may be due to the Activity/Energy facet. Also, in relation to stereotype threat, Sawyer and Hollis-Sawyer (2005) report that those higher in Extraversion are less prone to the effects of stereotype threat than those lower in Extraversion. Potentially, that could serve as an explanation for why "blanks" scored lower on Extraversion than "non-blanks."

The final difference between "blanks" and "non-blanks" was in the scale of Masculinity, which is most closely related to the Big Five dimension of Neuroticism. While the correlation between Masculinity and Neuroticism was found to be particularly strong in this analysis ($r = .34$), Hough and Ones (2001) felt that Masculinity was a scale that stood outside the bounds of the Big Five dimensions of personality. They consider it to be better represented as its own dimension. "Blanks" scored significantly lower than "non-blanks" on Masculinity as well. This evidence strongly supports the assumption that people who do not report gender are, in fact, women. Since masculinity is strongly correlated with gender ($r = .58$, $p < .001$), this distinction between "blanks" and "non-blanks" suggests that many of the "blanks" may be women. Relating back to stereotype threat, women who do not want to be judged by the negative stereotypes plaguing women in the workplace may avoid answering this demographic question so as to not draw attention to these negative stereotypes.

In conclusion, the personality differences found can all be associated with the assumption that those who do not report certain demographics may be members of the marginalized groups as well as with the stereotype threat assumption. However, readers were encouraged to interpret the results with caution because of the lack of measurement equivalence between the two groups. Study 2 will review the

modification of the DFS and GZTS scales in an attempt to restore measurement equivalence. If the same

personality differences surface in Study 2 as was found in Study 1, the results can be confidently

interpreted.

CHAPTER 6

STUDY 2

As was previously mentioned, the original DFS and GZTS scales were found to be psychometrically unstable. Study 2 represents an effort to improve the psychometric properties of the DFS and GZTS by analyzing each item and removing poorly performing items. Once a modified version of the DFS and GZTS scales was established, all analyses performed in Study 1 were replicated to determine if the modified scale produced different results.

CHAPTER 7

STUDY 2 METHOD

7.1 Participants

The same participants used in Study 1 were used in Study 2. The total number of "blanks" included in Study 2 was 620 and the same 620 "non-blanks" were used for Study 2 analyses.

7.2 Measures

The same measures used in Study 1 were again used in Study 2. However, the number of items in each personality scales was modified. Like Study 1, the personality assessment used in Study 2 was extracted from the Performance View™ and Performance Plus™ assessment products offered by BHI. The two personality surveys included in the assessment are the DFS (Guilford et al., 1954) and the GZTS (Guilford et al., 1976). However, the 15 (or 20) item scales were reduced down to five item scales.

7.3 Data Analysis

Item analysis was used to reduce the fifteen item scales down to five items. Specifically, the corrected item-total correlation and Cronbach alpha if-item-deleted statistics were calculated and analyzed. The highest corrected item-total correlations and the lowest Cronbach alpha if-item deleted coefficients were retained. The measurement equivalence and mean difference analyses performed in Study 1 were re-performed in Study 2 using the modified DFS and GZTS scales.

CHAPTER 8

STUDY 2 RESULTS

8.1 Item Analysis

Reliability analyses for each scale were performed in SPSS. Corrected item-total correlation and Cronbach's alpha if-item-deleted statistics were examined to determine how well each item represented the scale. The five items with the highest corrected item-total correlations and the lowest Cronbach's alpha if-item-deleted statistics were retained for the modified DFS and GZTS scales. Item analysis results for DFS retained items are displayed in Table 8, and item analysis results for retained GZTS items are displayed in Table 9. Reliability analyses were performed for the modified scales, and the internal consistency coefficients for each scale are listed in Table 10.

8.2 Measurement Equivalence

Again, the three tests of measurement equivalence that were tested were configural invariance, metric invariance, and equality of unique variances. For each test of measurement equivalence, models between the two groups were constrained to be equal and chi-square difference tests between the constrained model and the actual model were calculated and examined for non-significance. Fit indices were also examined to determine appropriate model fit. The results of each of these tests for each of the 15 personality scales using the modified DFS and GZTS scales are displayed in Table 11. As is indicated by the chi-square tests and the other fit indices, measurement equivalence between "blanks" and "non-blanks" is established in this study using the modified scales. The fit indices signify that the modified GZTS scales have superior fitting models compared to the modified DFS scales. Aside from the Need for Diversity scale, all scales have chi-square and fit index values fall into the acceptable ranges. While it is suggested to use the fit indices as a complement to the χ^2/degrees of freedom ratio and not as a firm rule (Vandenberg & Lance, 2000), the Need for Diversity scale was determined to be non-equivalent due to the fact that the majority of these indices fell outside of acceptable values. However, there is determined

to be measurement equivalence between "blanks" and "non-blanks" on this modified personality measure due to the fact that the other 14 scales show a majority of acceptable values. This establishment of equivalence allowed for further examination of mean differences.

8.3 Mean Differences

Another multivariate analysis of variance (or MANOVA) was used to test mean differences between "blanks" and "non-blanks" on the modified DFS and GZTS scale. All assumptions associated with the MANOVA were examined prior to analysis. Surprisingly, Hotelling's Trace revealed no significant differences between "blanks" and "non-blanks" on personality, $F(14, 1082) = 1.61$, $p = .070$ with partial eta squared = .020. The lack of significance in this omnibus test prohibits further examination. It is important to note that the difference in degrees of freedom between Study 1 and Study 2 is because of the reduced number of items on the modified DFS and GZTS scales.

CHAPTER 9

STUDY 2 DISCUSSION

The purpose of Study 2 was to modify the psychometrically unstable DFS and GZTS scales in an effort to achieve measurement equivalence. Establishing measurement equivalence allows mean differences assessed between groups to be meaningful and to be interpreted without caution. Modifying the original DFS and GZTS scales led to the successful establishment of measurement equivalence, however, no significant differences between groups were found with this modification. This finding was surprising and accompanied with it some important implications. First of all, this finding alludes the importance of examining measurement equivalence before examining mean differences and suggests that the differences found in Study 1 cannot be confidently concluded and may have been indicative of the non-equivalence between groups rather than actual differences between "blanks" and "non-blanks." Secondly, the current study calls the use of DFS and GZTS personality scales into question.

It was predicted that individual differences in personality may be driving some people to report the demographic variables of gender, race, and age and may be driving other people to refuse these questions. However, the results of the current study using the modified DFS and GZTS scales found no significant differences between these two groups of people on certain personality variables. This indicates that the differences found in Study 1 may not be accurate and that there may actually be no difference in personality between "blanks" and "non-blanks." Therefore, some other individual difference (besides personality) may be responsible for why some report demographics and others do not. However, of particular concern is the psychometric stability of the personality scales used in the present study to measure personality.

The DFS and GZTS personality scales have been well established and widely used in organizational settings for many years (Guilford et al., 1976). Nevertheless, the present study has demonstrated that because a measure has been widely used does not necessarily imply that it is

psychometrically sound. Analyses performed in the current study to confirm the factor structure of a single group (rather than equating two groups) produced an improperly fitting model. This lead to the conclusion that the factor structure of these scales was flawed. Review of the item content revealed some glaring problems with the DFS and GZTS scales. Due to the fact that both scales were developed over 50 years ago (Guilford et al., 1954; Guilford et al., 1976), the content may be outdated. This is not to imply that the personality constructs being measured have changed over time, but rather that the specific item wording may be outdated by today's standards. For instance, two items on the DFS scale of Need for Diversity read, "you enjoy reading stories like *Alice in Wonderland*" and "you would like to play card games like bridge or pinochle" (Guilford et al., 1954). Both of these items highlight the age of the scale. Younger generations may not be familiar with *Alice in Wonderland* and may have never heard of bridge or pinochle. These differences may be contributing to the measurement equivalence problems encountered in Study 1. Additionally, an item on the GZTS scale of People Relations reads, "in most places the traffic laws are in great need of improvement" (Guilford et al., 1976). While this item is not indicative of generational differences, it does call into question how this item would load onto a factor designed to tap People Relations. In can easily be argued that ideas about traffic laws have no relation to how well you interact with other individuals.

In conclusion, a valuable lesson can be learned from the results of Study 2. The lesson is to resist trusting the psychometric properties of a measure or a scale just because it has been published, widely used, and/or has a test manual. It may still be in need of re-validation and refinement. A review of the literature was conducted to determine if the DFS and/or GZTS scales underwent refinement or re-validation in the last 30 years, and no such evidence was found. The psychometric problems with the DFS and GZTS scales in particular make it difficult to determine reliably if there are meaningful differences in personality between "blanks" and "non-blanks." This deterrent is unfortunate because understanding personality differences between individuals who report demographic variables and those who do not offers great insight for researchers and organizations who track demographic information for ethical purposes.

CHAPTER 10

GENERAL DISCUSSION

The purpose of the current study was to examine the personality differences between those who do not report the demographic variables of gender, age, and/or race and those who do report these variables. It was expected that this knowledge could supply insight to the personality traits that drive people to eschew responding to demographic questionnaires. Unfortunately, psychometric flaws with the personality measure used in this analysis thwarted efforts to determine differences between "blanks" and "non-blanks." Specifically, measurement equivalence between the two groups could not clearly be established in the initial study, yet mean differences were detected on the mapped scales of Openness to Experience, Extraversion, and Masculinity. Because these results were to be interpreted with caution due to the lack of equivalence, a second study was conducted to modify the personality measure by analyzing each item. This effort proved to be useful in establishing measurement equivalence, but eliminated all mean differences between the two groups. Consequentially, the current study cannot reliably determine if meaningful personality differences exist between those who report demographics and those who do not.

10.1 Limitations and Future Directions

Clearly, a significant limitation to this study was the personality measure used in the analyses. Results signified that the DFS and GZTS scales were not psychometrically stable. A review of item content pointed to many reasons why the items were not functioning properly. An obvious suggestion for future research is that future studies examine personality differences between "blanks" and "non-blanks" using a psychometrically sound measure of personality. Personality differences between "blanks" and "non-blanks" may exist even though the current study was unable to confidently detect any differences. It is believed that the main reason for not finding significant differences was due to the fact that a psychometrically unstable personality measure was used. Future studies should to replicate the current study using reliable personality measures.

Additionally, had the personality measure not been as big of a problem as it was, there were still other limitations. Generalizability of the findings could be of concern. Due to the fact that the sample used in this analysis consisted mostly of managers in the restaurant industry, the results may not generalize to other industries or jobs. However, personalities are expected to differ based on the job type or industry, because different personalities have strong proclivities towards certain professions and not others (Coombs, 1978). So, generalizing these findings directly to other professions may prove to be effort in futility. Also, the fact that the sample was more homogenous in terms of occupation may serve as somewhat of a control so that differences between "blanks" and "non-blanks" are more attributable to actual differences rather than differences in occupational choice. Additionally, it may never be the case that such findings could generalize to the entire population. The better course of action may be to study the personality differences of "blanks" and "non-blanks" within certain industries or job types and then examine the similarities across job types. Nevertheless, an effort to increase generalizability of these findings was attempted by mapping the existing personality scales to the Big Five dimensions of personality.

The exploratory nature of this study may also be viewed as a limitation. An open search of personality differences was explored rather than testing specific hypotheses. However, little research has been done examining this topic. Missing variables on demographics are often viewed as a nuisance and usually get tossed aside during the analysis rather than actually being examined in the analysis. Due to the dearth of research on this topic, it is difficult to obtain a strong theoretical basis or hypotheses from which to test.

It is strongly encouraged that future research examines these missing demographic variables. Because it is assumed that minority or subordinate groups are more likely to leave these questions blank, richness of data may be jeopardized if these already small groups do not get their appropriate representation. While "blanks" may be seen as a small and insignificant number of people compared to the actual total, it is sometimes the case that "blanks" almost reach or even outnumber the total of some minority groups. Therefore, it is imperative that minority groups or subordinate groups get as much representation as possible. Organizations seeking to exercise fair and ethical practices by asking these demographic questions to monitor adverse impact lose important data when individuals fail to report this

information. With this regard, future studies should determine what effect "blanks" have on organizational pre-employment or promotion processes. It is possible that adverse impact or other such litigious outcomes can be affected by the lack of representation in these minority/subordinate groups (especially if the assumption that "blanks" are minorities or subordinate group members is true). Consequently, organizations can greatly benefit from this research.

It is also suggested that studies be conducted that actually assess the veracity of the assumption that "blanks" are members of subordinate or minority groups rather than merely making speculations. This study was unable to ascertain the true identity of the "blanks," and therefore could not confidently explain any of the findings, but rather could only surmise about the true nature of the findings. Future studies should follow-up with participants to gather data on their actual demographics.

Table 1

High and Low Score Indicators for the Big Five Personality Dimensions

Factor	High Score	Low Score
1) Emotional Stability	Well-adjusted Relaxed Self-assured Even-tempered	Moody Anxious Worrying Insecure
2) Extraversion	Energetic Active Vigorous Talkative Assertive	Introverted Silent Submissive Passive Unenergetic
3) Openness to Experience	Imaginative Curious Creative Insightful	Shallow Conventional Unanalytical Down to earth
4) Agreeableness	Amicable Cooperative Popular Affectionate Altruistic Kind	Uncooperative Disagreeable Unfriendly Selfish Hostile Egocentric
5) Conscientiousness	Organized Thorough Competent Work-oriented Perfectionistic	Disorganized Quitting Irresponsible Careless Negligent

Table 2

Reliabilities of Scores on the Dynamic Factors Survey

	LT	SR	NF	RT	ND
Men	.90	.81	.68	.77	.96
Women	.80	.78	.73	.79	.85
Men and Women	.87	.80	.71	.78	.83

Note. LT=Liking for Thinking, SR=Self-Reliance, NF=Need for Freedom, RT=Realistic Thinking, ND=Need for Diversion; Adapted from Guilford et al., 1954.

Table 3

An Interpretation of the Traits Measured by the GZTS

Trait	Definition
General Activity	This measures a person's quickness of pace, sense of urgency, physical stamina, and action orientation.
Restraint	This category measures the degree to which a person shows self-discipline, responsibility, and seriousness about work.
Ascendance	This area reflects a person's ability to be outspoken, assertive, and persuasive.
Sociability	This category measures a person's ability to interact with people and their frequency of contact.
Emotional Stability	This area measures a person's consistency of mood, tolerance for frustration, and maintenance of composure under pressure.
Objectivity	This category measures a person's ability to maintain an objective, rational perspective.
Friendliness	In the inverse, this category measures the degree to which a person is capable of making demands upon other people, being critical in evaluating standards, and facing conflict in a direct and straightforward manner.
Thoughtfulness	This area measures the degree to which a person is introspective and attempts to understand information at a deeper level.
Personal Relations	This area measures the degree of optimism and tolerance in a person's general outlook towards others.
Masculinity	This area measures the degree of masculine characteristics a person possesses.

Table 4

Guilford Zimmerman Temperament Scales and Their Internal Consistency Reliability

Scale	Reliability Coefficient
1. General Activity	.79
2. Restraint	.80
3. Ascendance	.82
4. Sociability	.87
5. Emotional Stability	.84
6. Objectivity	.75
7. Friendliness	.75
8. Thoughtfulness	.80
9. Personal Relations	.80
10. Masculinity	.85

Note: Adapted from (Guilford et al., 1978)

Table 5

Internal Consistency Reliability Coefficients for Phase One Participants

Scale	Phase One α	Existing α	Δ in α
1. Drive & Energy/General Activity	.76	.79	-.03
2. Self-Discipline/Restraint	.73	.80	-.07
3. Emotional Stability	.84	.84	.00
4. Objectivity	.82	.75	.07
5. Ascendance/Assertiveness	.78	.82	-.04
6. Sociability	.88	.87	.01
7. Friendliness	.78	.75	.03
8. Thoughtfulness	.81	.80	.01
9. People Relations	.71	.80	-.09
10. Masculinity	.83	.85	-.02
11. Liking for Thinking	.86	.87	-.01
12. Self-Reliance	.68	.80	-.02
13. Need for Freedom	.72	.71	.01
14. Realistic Thinking	.79	.78	.01
15. Need for Diversity	.77	.83	-.05

Note. α = Cronbach's alpha and Δ in α = change in Cronbach's alpha

Table 6

Results of the Correlational Analyses

Personality Scale	*r*	BFI mapping
GZTS Scales		
Drive and Energy	.53	Extraversion
Self-Discipline/Restraint	.40	Conscientiousness
Emotional Stability	-.66	Neuroticism
Objectivity	-.50	Neuroticism
Ascendance/Assertiveness	.60	Extraversion
Sociability	.72	Extraversion
Friendliness	---	No mapping
Thoughtfulness/Long-Range Thinking	.53	Openness
People Relations	---	No mapping
Masculinity	-.34	Neuroticism
DFS Scales		
Liking for Thinking	.31	Openness
Self-Reliance	-.34	Neuroticism
Need for Freedom	-.36	Conscientiousness
Realistic Thinking	-.33	Openness
Need for Diversity	.34	Openness

Table 7

Tests of Measurement Equivalence Between Blanks and Non-blanks

	df	χ²	NNFI	RMSEA	SRMR	CFI	NFI
Liking For Thinking							
Configural Invariance	182	1459.71	.69	.11	.08	.73	.70
Metric Invariance	196	2354.67	.70	.11	.08	.72	.69
Equality of Unique Variance	210	2413.73	.71	.10	.08	.71	.69
Self-Reliance							
Configural Invariance	182	1031.95	.55	.07	.06	.61	.57
Metric Invariance	196	1063.05	.57	.07	.06	.60	.55
Equality of Unique Variance	210	1092.93	.59	.06	.06	.59	.54
Need for Freedom							
Configural Invariance	182	1311.55	.60	.08	.06	.66	.62
Metric Invariance	196	1361.57	.62	.08	.07	.64	.60
Equality of Unique Variance	210	1530.61	.59	.08	.07	.59	.55
Realistic Thinking							
Configural Invariance	182	1127.50	.73	.07	.06	.77	.73
Metric Invariance	196	1142.16	.75	.07	.06	.77	.73
Equality of Unique Variance	210	1151.12	.77	.07	.06	.77	.73
Need for Diversity							
Configural Invariance	182	2072.11	.54	.10	.09	.60	.57
Metric Invariance	196	2081.82	.57	.10	.09	.60	.57
Equality of Unique Variance	210	2106.35	.60	.10	.09	.60	.57
Assertiveness							
Configural Invariance	342	2059.75	.62	.07	.07	.66	.62
Metric Invariance	361	3123.86	.69	.09	.08	.70	.67
Equality of Unique Variance	380	3155.16	.70	.09	.08	.70	.67

Table 7 – Continued

Emotional Stability							
Configural Invariance	182	2659.12	.49	.12	.10	.56	.54
Metric Invariance	196	2679.25	.52	.11	.10	.56	.53
Equality of Unique Variance	210	2790.98	.54	.11	.10	.54	.52
Friendliness							
Configural Invariance	182	1638.78	.59	.09	.07	.64	.61
Metric Invariance	196	1709.28	.60	.09	.08	.63	.59
Equality of Unique Variance	210	1737.52	.62	.09	.08	.62	.59
Drive and Energy							
Configural Invariance	182	1603.82	.66	.09	.07	.71	.68
Metric Invariance	196	1752.90	.66	.09	.08	.68	.65
Equality of Unique Variance	210	1791.28	.68	.09	.08	.68	.64
Masculinity							
Configural Invariance	182	1319.96	.71	.08	.07	.75	.72
Metric Invariance	196	1398.37	.71	.08	.08	.73	.70
Equality of Unique Variance	210	1448.98	.72	.08	.08	.72	.69
Objectivity							
Configural Invariance	182	1613.90	.61	.09	.08	.66	.63
Metric Invariance	196	1655.71	.63	.09	.08	.66	.62
Equality of Unique Variance	210	1676.78	.65	.08	.08	.65	.62
People Relations							
Configural Invariance	182	1177.03	.78	.07	.06	.81	.78
Metric Invariance	196	1206.40	.79	.07	.06	.80	.77
Equality of Unique Variance	210	1228.97	.80	.07	.06	.80	.77
Restraint							
Configural Invariance	342	2620.32	.42	.08	.08	.47	.44

Table 7 – Continued

Metric Invariance	361	2676.13	.43	.08	.08	.46	.42
Equality of Unique Variance	380	2707.92	.46	.08	.08	.46	.41
Sociability							
Configural Invariance	182	1354.99	.70	.08	.07	.74	.71
Metric Invariance	196	1433.99	.71	.08	.07	.73	.69
Equality of Unique Variance	210	1467.07	.72	.08	.08	.72	.68
Thoughtfulness							
Configural Invariance	182	1529.22	.62	.09	.07	.67	.64
Metric Invariance	196	1563.53	.64	.08	.08	.66	.63
Equality of Unique Variance	210	1605.42	.66	.08	.08	.66	.62

Table 8

Item Analysis of DFS Scales

Retained Items	Alpha if-item deleted	Item-total *r*
Liking for Thinking		
Item 6	.798	.587
Item 3	.802	.553
Item 15	.805	.499
Item 11	.804	.515
Item 5	.806	.490
Self-Reliance		
Item 13	.557	.354
Item 9	.565	.315
Item 11	.568	.300
Item 5	.569	.297
Item 7	.575	.281
Need for Freedom		
Item 10	.620	.478
Item 6	.637	.400
Item 7	.648	.338
Item 4	.655	.338
Item 8	.644	.344
Realistic Thinking		
Item 12	.718	.556
Item 10	.727	.476
Item 14	.729	.466
Item 9	.728	.473
Item 6	.731	.434
Need for Diversity		
Item 15	.686	.464
Item 9	.686	.451
Item 6	.694	.392
Item 3	.693	.389
Item 1	.697	.361

Table 9

Item Analysis of GZTS Scales

Retained Items	Alpha if-item deleted	Item-total *r*
Assertiveness		
Item 19	.694	.472
Item 6	.702	.418
Item 14	.704	.375
Item 16	.706	.358
Item 7	.706	.358
Emotional Stability		
Item 1	.719	.469
Item 13	.721	.455
Item 9	.722	.445
Item 15	.726	.428
Item 5	.728	.411
Friendliness		
Item 9	.692	.466
Item 4	.694	.459
Item 1	.695	.443
Item 5	.697	.428
Item 14	.701	.399
Drive and Energy		
Item 12	.616	.379
Item 3	.621	.357
Item 9	.622	.347
Item 1	.628	.325
Item 4	.631	.311
Masculinity		
Item 6	.694	.488
Item 5	.700	.445
Item 7	.702	.422
Item 4	.706	.394
Item 11	.710	.359
Objectivity		
Item 6	.675	.477
Item 13	.673	.468
Item 2	.674	.457
Item 8	.683	.398
Item 11	.685	.380

Table 9 – Continued

Retained Items	Alpha if-item deleted	Item-total r
People Relations		
Item 11	.783	.632
Item 3	.792	.524
Item 10	.795	.492
Item 13	.795	.490
Item 6	.798	.457
Restraint		
Item 1	.511	.313
Item 10	.519	.278
Item 11	.527	.256
Item 14	.524	.250
Item 7	.529	.228
Sociability		
Item 12	.733	.517
Item 1	.739	.502
Item 11	.739	.466
Item 4	.747	.445
Item 5	.743	.428
Thoughtfulness		
Item 5	.707	.533
Item 1	.711	.498
Item 15	.717	.452
Item 11	.722	.401
Item 14	.723	.390

Table 10

Internal Consistency Reliability Coefficients for Modified DFS and GZTS Scales

Personality Scale	Cronbach's Alpha
DFS Scales	
Liking for Thinking	.72
Self-Reliance	.49
Need for Freedom	.54
Realistic Thinking	.69
Need for Diversity	.70
GZTS Scales	
Ascendance/Assertiveness	.62
Emotional Stability	.61
Friendliness	.70
Drive and Energy	.49
Masculinity	.64
Objectivity	.67
People Relations	.71
Self-Discipline/Restraint	.43
Sociability	.63
Thoughtfulness/Long Range Thinking	.66

Table 11

Tests of Measurement Equivalence Between Blanks and Non-blanks Using Modified Scales

	df	χ²	NNFI	RMSEA	SRMR	CFI	NFI
Liking For Thinking							
Configural Invariance	12	56.19	.84	.08	.03	.90	.88
Metric Invariance	16	61.07	.88	.07	.05	.90	.87
Equality of Unique Variance	20	86.93	.86	.08	.07	.86	.83
Self-Reliance							
Configural Invariance	12	15.93	.98	.02	.02	.99	.94
Metric Invariance	16	22.51	.97	.03	.03	.97	.92
Equality of Unique Variance	20	24.03	.98	.02	.03	.98	.91
Need for Freedom							
Configural Invariance	12	19.54	.90	.03	.03	.94	.88
Metric Invariance	16	33.66	.84	.04	.04	.88	.79
Equality of Unique Variance	20	53.66	.75	.05	.07	.75	.66
Realistic Thinking							
Configural Invariance	12	67.47	.89	.09	.04	.93	.92
Metric Invariance	16	76.93	.91	.08	.04	.93	.91
Equality of Unique Variance	20	80.71	.93	.07	.05	.93	.91
Need for Diversity							
Configural Invariance	12	45.88	.66	.07	.05	.79	.75
Metric Invariance	16	46.26	.77	.06	.05	.81	.75
Equality of Unique Variance	20	52.56	.81	.05	.06	.81	.72
Assertiveness							
Configural Invariance	12	12.13	.99	.00	.03	.99	.77
Metric Invariance	16	18.14	.97	.05	.04	.98	.76
Equality of Unique Variance	20	20.26	.91	.06	.06	.93	.76

Table 11 – Continued

Emotional Stability							
Configural Invariance	12	39.36	.87	.06	.04	.92	.89
Metric Invariance	16	40.42	.91	.05	.05	.93	.89
Equality of Unique Variance	20	85.86	.79	.07	.08	.79	.74
Friendliness							
Configural Invariance	12	29.24	.96	.05	.03	.98	.96
Metric Invariance	16	30.88	.98	.04	.03	.98	.96
Equality of Unique Variance	20	32.30	.98	.03	.03	.98	.96
Drive and Energy							
Configural Invariance	12	21.26	.93	.04	.03	.96	.91
Metric Invariance	16	22.96	.96	.03	.03	.97	.91
Equality of Unique Variance	20	30.10	.96	.03	.04	.96	.88
Masculinity							
Configural Invariance	12	20.71	.98	.04	.03	.99	.97
Metric Invariance	16	22.10	.99	.03	.03	.99	.96
Equality of Unique Variance	20	31.07	.98	.03	.04	.98	.95
Objectivity							
Configural Invariance	12	18.57	.98	.03	.02	.99	.97
Metric Invariance	16	19.74	.99	.02	.03	.99	.97
Equality of Unique Variance	20	21.73	.99	.01	.03	.99	.97
People Relations							
Configural Invariance	12	28.59	.97	.05	.03	.98	.97
Metric Invariance	16	33.19	.97	.04	.04	.98	.96
Equality of Unique Variance	20	36.97	.98	.04	.04	.98	.96
Restraint							
Configural Invariance	12	22.45	.91	.04	.02	.95	.89

Table 11 – Continued

Metric Invariance	16	27.93	.92	.04	.03	.94	.87
Equality of Unique Variance	20	29.85	.95	.03	.03	.95	.86
Sociability							
Configural Invariance	12	18.11	.98	.03	.03	.99	.97
Metric Invariance	16	34.66	.95	.04	.06	.96	.94
Equality of Unique Variance	20	36.31	.97	.04	.06	.97	.93
Thoughtfulness							
Configural Invariance	12	28.22	.96	.05	.03	.98	.96
Metric Invariance	16	31.22	.97	.04	.04	.98	.96
Equality of Unique Variance	20	34.52	.98	.04	.04	.98	.95

APPENDIX A

BIG FIVE PERSONALITY ITEMS

Big Five Inventory Items

bfi001   Is talkative

bfi002   Tends to find fault with others

bfi003   Does a thorough job

bfi004   Is depressed, blue

bfi005   Is original, comes up with new ideas

bfi006   Is reserved

bfi007   Is helpful and unselfish with others

bfi008   Can be somewhat careless

bfi009   Is relaxed, handles stress well

bfi010   Is curious about many different things

bfi011   Is full of energy

bfi012   Starts quarrels with others

bfi013   Is a reliable worker

bfi014   Can be tense

bfi015   Is ingenious, a deep thinker

bfi016   Generates a lot of enthusiasm

bfi017   Has a forgiving nature

bfi018   Tends to be disorganized

bfi019   Worries a lot

bfi020   Has an active imagination

bfi021   Tends to be quiet

bfi022   Is generally trusting

bfi023   Tends to be lazy

bfi024   Is emotionally stable, not easily upset

bfi025   Is inventive

bfi026   Has an assertive personality

bfi027   Can be cold and aloof

bfi028	Perseveres until the task is finished
bfi029	Can be moody
bfi030	Values artistic, aesthetic experiences
bfi031	Is sometimes shy, inhibited
bfi032	Is considerate and kind to almost everyone
bfi033	Does things efficiently
bfi034	Remains calm in tense situations
bfi035	Prefers work that is routine
bfi036	Is outgoing, sociable
bfi037	Is sometimes rude to others
bfi038	Makes plans and follows through with them
bfi039	Gets nervous easily
bfi040	Likes to reflect, play with ideas
bfi041	Has few artistic interests
bfi042	Likes to cooperate with others
bfi043	Is easily distracted
bfi044	Is sophisticated in art, music, or literature

APPENDIX B

DYNAMIC FACTORS SURVEY AND GUILFORD ZIMMERMAN ITEMS

Dynamic Factor Survey and Guilford Zimmerman Temperament Items

G1*   You are happiest when you get involved in some project that calls for rapid action.

G2   You like to have plenty of time to stop and rest.

G3*   You are the kind of person who is "on the go" all the time.

G4*   People think you are a very energetic person.

G5   You are quick in your actions.

G6   You always seem to have plenty of vigor and vitality

G7   You sometimes wish that people would slow down a bit and give you a chance to catch up.

G8   You are able to work for unusually long hours without feeling tired.

G9*   You are inclined to rush from one activity to another without pausing enough for rest.

G10   You are less energetic than many people you know.

G11   You get things done in a hurry.

G12*   At work or play other people find it hard to keep up with the pace you set.

G13   You dislike to be hurried in your work.

G14   People sometimes tell you to "slow down" or "take it easy."

G15   Others are often amazed by the amount of work you turn out.

R1*   You believe in the idea that we should "eat, drink and be merry, for tomorrow we die."

R2   You are inclined to stop to think things over before you act.

R3   You like work that requires considerable attention to details.

R4   You are a carefree individual.

R5   You take life very seriously.

R6   You often crave excitement.

R7*   You sometimes make quick decisions that you later wish you hadn't made.

R8   You have a habit of starting things and then losing interest in them.

R9   It is difficult for you to understand people who get very concerned about things.

R10*   You make decisions on the spur of the moment.

R11*   You often act on the first thought that comes to your head.

R12   You are a happy-go-lucky individual.

R13   You can listen to a lecture without feeling restless.

        You like wild enthusiasm, sometimes to a point bordering on rowdiness, at a

R14*   football or baseball game.

R15   You keep at a task until it is done, even after nearly everyone else has given up.

R16   You seldom let your responsibilities interfere with your having a good time.

R17   You generally feel as though you haven't a care in the world.

R18   You usually say what you feel like saying at the moment.

R19   When you get angry, if you let yourself go you feel better.

R20   You enjoy playing games that require you to take risks.

E1*   You are sometimes bubbling over with energy and sometimes very sluggish.

E2   You sometimes feel "just miserable" for no good reason at all.

E3   You often feel grouchy.

E4   You daydream a great deal.

        You have frequent ups and downs in mood, sometimes with and sometimes

E5*   without apparent cause.

E6   There are times when your future looks very dark.

E7   You feel lonesome even when with other people.

        Your mood often changes from happiness to sadness, or vice versa, without

E8   your knowing why.

        There are times when your mind seems to work very slowly and other times

E9*   when it works very rapidly.

        You are sometimes bothered by having a useless thought come into your mind

E10   over and over.

E11   You have often lost sleep over your worries.

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E12   Your daydreams are often about things that can never come true.

E13*   Your mood is very easily influenced by people around you.

E14   You generally keep cool and think clearly in exciting situations.

E15*   You sometimes feel listless and tired for no good reason.

O1   You nearly always receive all the credit that is coming to you for things you do.

O2*   People talk about you behind your back.

O3   Other people often blame you for things you didn't do.

O4   You are touchy about some things.

O5   You get over a humiliating experience very quickly.

O6*   Certain people deliberately say or do things to annoy you.

O7   You have felt that certain persons are secretly trying to get the better of you.

O8*   You have been seriously slighted more than once.

O9   Other people too often take the credit for things you yourself have done.

O10   You often feel that a speaker is talking about you personally.

O11*   You have days in which it seems that everything goes wrong.

O12   You are too sensitive for your own good.

O13*   People have criticized you unjustly to others.

          When you lose something, you often begin to suspect someone of either having

O14   taken it or having misplaced it.

O15   There are times when it seems that everyone is against you.

          You have more than once taken the lead in organizing a project or a group of

A1   some kind.

          If you hold an opinion that is radically different from that expressed by a

          lecturer, you are likely to tell the person about it either during or after the

A2   lecture.

A3   You are satisfied to let someone else take the lead in group activities.

A4   When people do not play fair you hesitate to say anything about it to them.

A5   You enjoy applying for a job in person.

A6*   The thought of making a speech frightens you.

          You find it difficult to ask people for money or other donations, even for a cause

A7*   in which you are interested.

          When you were a child, many of your playmates naturally expected you to be

A8   the leader.

          You hesitate to walk into a meeting when you know that everyone's eyes will be

A9   upon you.

A10   You take the lead in putting life into a dull party.

          When you are served stale or inferior food in a restaurant, you say nothing

A11   about it.

A12   You go out of your way to meet new people whom you find interesting.

A13   You speak out in meetings to oppose those whom you feel sure are wrong.

A14*   You like to sell things (that is, to act as a salesperson).

          When you think you recognize people you see in a public place, you ask them

A15   whether you have met them before.

A16*   You feel self-conscious in the presence of important people.

          You would like to take on important responsibilities such as organizing a new

A17   business.

          You find it difficult to get rid of a salesperson to whom you do not care to listen

A18   or give your time.

A19*   You like to speak in public.

          If someone you know has been spreading untrue and bad stories about you,

A20   you see the person as soon as possible and have a talk about it.

S1*   You find it easy to make new acquaintances

S2   You like to take part in many social activities.

S3   It is difficult for you to chat about things in general with people.

S4*   You enjoy getting acquainted with people.

S5*   You find it easy to start conversation with strangers.

S6	You are so naturally friendly that people immediately feel at ease with you.
S7	You sometimes avoid social contacts for fear of doing or saying the wrong thing.
S8	After being introduced to someone, you just cannot think of things to say to make good conversation.
S9	You have difficulty in making new friends.
S10	You are inclined to limit your acquaintances to a select few.
S11*	There are only a few friends with whom you can relax and have a good time.
S12*	People think of you as being a very social type of person.
S13	Other people say that it is difficult to get to know you well.
S14	You have hesitated to make or to accept "dates" because of shyness.
S15	Shyness keeps you from being as popular as you should be.
F1*	You would like to tell certain people a thing or two.
F2	In most cases it is important to get what you want even if you have to fight to get it.
F3	You hate to lose in a contest.
F4*	You know someone whom you would particularly like to see "put in his (or her) place."
F5*	You have frequently felt like telling "nosey" people to mind their own business.
F6	In group undertakings you almost always feel that your own plans are best.
F7	When people become bossy or domineering, you want to do the opposite of everything they tell you.
F8	You get a lot of satisfaction from making other people do as you want them to.
F9*	When people are not playing fair, you like to see them beaten at their own game.
F10	You are unhappy unless things in an organization go pretty much as you want them to.
F11	You would like to have enough money or power in order to impress people who think they are better than you are.

F13   It bothers you to have other people tell you what you should do.

F14*   There are some people whose actions seem continually to irritate you.

F15   If anyone steps ahead of you in line, he or she is likely to hear from you about it.

F12   You have often found it necessary to fight for what you believe to be right.

T1*   You often try to analyze the motives of others.

T2   You are usually too busy to spend time in reflective thought.

T3   You make it a policy to evaluate your past actions carefully.

T4   You like to discuss the more serious questions of life with your friends.

You often would like to know the underlying reasons behind the actions of other

T5*   people.

T6   You enjoy thinking through complicated problems.

T7   You often take time out just to meditate about things.

T8   You find it very interesting to watch people to see what they will do.

T9   You try to sense what people are thinking about as they talk to you.

T10   You enjoy analyzing your own thoughts and feelings.

T11*   You often watch others to see what effects your words or actions have on them.

T12   You often wonder about why human life exists and what its future is.

You are inclined to live in the present, leaving the past and the future out of your

T13   thoughts.

T14*   You like to have time to be alone with your thoughts.

T15*   You often wonder why people behave as they do.

P1   In most places the traffic laws are in great need of improvement.

Most people keep to the "straight and narrow path" only because of the fear of

P2   being caught.

Far too many people try to take as much as they can and give as little as

P3*   possible back to society.

P4   Most people today try to do an honest day's work for a day's pay.

P5   There are far too many useless laws which hamper an individual's personal

freedom.

P6*   Most people who get ahead today do so because they have "pull."

         In general, people higher up tend to assume their share of the dirty work, not

P7   leaving it for others to do.

P8   If you want a thing done right, you must do it yourself.

P9   Some people pay more attention to your comings and goings than they should.

P10*   Most people use politeness to cover up what is really "cutthroat" competition.

P11*   Most people are out to get more than they give.

P12   Some people deliberately make things hard for you.

P13*   Most people will tell a lie now and then in order to get ahead.

         There are entirely too many employees who deserve higher pay than their

P14   bosses.

P15   Nearly all people try to do the right thing when given a chance.

M1   You would like to go hunting with a rifle for wild game.

M2   You can look at snakes without shuddering.

M3   When a parent, teacher, or boss scolds you, you feel like crying.

M4*   The idea of finding a bug or a worm crawling on you makes you shudder.

M5*   You like to read true stories about love and romance.

M6*   You would rather be a forest ranger than a dress designer.

M7*   You would rather be an interior decorator than an architectural engineer.

M8   You would rather go to an athletic event than to a dance.

M9   You can handle a loaded gun without feeling at all jittery.

M10   You cry rather easily.

M11*   You would rather be a building contractor than a nurse.

M12   You feel sorry for a fish that is caught on a hook.

M13   You feel uncomfortable openly expressing your feelings.

M14   You would rather be a miner than a florist.

M15   When you become emotional you come to the point of tears.

LT1   You like to talk to friends about various ideas or theories.

LT2   You like to do logical-type problems.

LT3*   You would like to study logical methods.

LT4   You would like to use statistics to predict business trends.

LT5*   You would like to study the philosophy of science.

LT6*   You would like to study principles of probability.

LT7   You would like to take part in debates.

LT8   You would like to discuss philosophical problems.

LT9   You would like to work mathematical puzzles.

LT10   You would like to learn more about the history of human thought.

LT11*   You would like to develop a new statistical formula.

LT12   You like to do serious thinking toward a rational solution of current problems.

LT13   You would like to work things out by rules of logic.

LT14   You would like to figure out an accounting system for a pension plan.

LT15*   You would like to develop a short-cut calculating system.

SR1   You sometimes carry a good luck charm.

SR2   You seem to be at the mercy of people who are more dominant than you are.

SR3   You usually try to get someone to help you with tough assignments.

           One of the best things about eating in a restaurant is having someone wait on
SR4   you.

SR5*   Sometimes you are just too agreeable.

           You almost always ask the advice of an older and more experienced person
SR6   before making personal decisions.

SR7*   You must have an inspiring leader in order to do your best work.

SR8   You like to have people do favors for you.

SR9*   You sometimes forget to mail a letter at the time you intend to.

SR10   You often prepare for examinations by last-minute cramming.

SR11*   You need a stronger person to depend on now and then.

SR12   You are strong believer in luck.

SR13*   You usually get help when you have to make an important decision.

        You become so attached to your friends that you can hardly get along without

SR14   them.

SR15   You often tell others of your personal problems.

        You would like to have your supervisor set definite deadlines for completing

NF1   your work.

NF2   Too much emphasis on neatness interferes with efficiency.

NF3   People waste too much time trying to plan everything ahead of time.

NF4*   You have always hated regulations.

NF5   You seldom know ahead of time how you will spend the evening.

NF6*   Sometimes you get satisfaction out of breaking the rules.

NF7*   You dislike following a set schedule.

NF8*   You hate to be ordered around.

NF9   You are irritated when your boss tells you what to do rather than asks you.

NF10*   You are annoyed when living under strict discipline.

NF11   In order to be happy, you always have to feel free to come and go as you like.

NF12   There are too many old-fashioned people who spoil your fun.

        People should be permitted to act as they please without worrying about the

NF13   opinions of others.

NF14   Most people are too conservative.

NF15   You dislike bossy people.

RT1   You like to imagine what other people might be doing at a particular time.

RT2   You like to imagine yourself to be the hero of success stories.

RT3   You like to make up exciting plots with yourself as a character.

RT4   You would like to see someone you dislike placed in an embarrassing position.

RT5   You would like to see someone make a fool of the villain in a movie.

RT6*   You spend a lot of time imagining yourself in the future.

RT7	You like to be around people who are always cracking jokes.
RT8	You like to think about what you might have said in situations you were in.
RT9*	You like to imagine what you would do if you won the grand prize in a big contest.
RT10*	You like to think of all the things that you would do if you were more wealthy.
RT11	You would like to spend every minute of your spare time in fun and amusement.
RT12*	You like to dream about what it would be like to be famous.
RT13	You like to think about all the great things you might have done.
RT14*	You would like to think about how you would act after you did some heroic deed.
RT15	You like to have personal heroes.
ND1*	You like to read books about fantastic places and happenings.
ND2	You would enjoy telling fairy tale stories to children.
ND3*	You would enjoy seeing movies about trips to Mars.
ND4	You like to solve riddles.
ND5	You would like to spend all day just watching the animals at the zoo.
ND6*	You enjoy reading stories like Alice in Wonderland.
ND7	You get a lot of fun out of playing new games.
ND8	You would enjoy operating a miniature railroad.
ND9*	You like to read adventure stories.
ND10	You enjoy reading detective stories.
ND11	Flying a kite is fun for you.
ND12	You would like to play card games like bridge or pinochle.
ND13	You get a lot of fun out of playing with dogs or other pets.
ND14	You would like to be a contestant on a TV show.
ND15*	You enjoy reading stories about human-like creatures on other planets.

Note: (*) represents retained items; G = Drive and Energy, R = Restraint, E = Emotional Stability, O = Objectivity, A = Assertiveness, S = Sociability, F = Friendliness, T = Thoughtfulness, P = People Relations, M = Masculinity, LT = Liking for Thinking, SR = Self-Reliance, NF = Need for Freedom, RT = Realistic Thinking, and ND = Need for Diversity

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Inc.

BIOGRAPHICAL INFORMATION

Chloe Tatney received her master's degree in Industrial/Organizational Psychology on May 12, 2008. Ms. Tatney maintained a 4.0 GPA in four of the five semesters of her master's program. After completing her master's degree, Ms. Tatney continued in the psychology program to pursue a doctorate degree in Experimental Psychology. Her research interests include diversity issues, fairness in the workplace, and cognitive ability testing in the workplace. Ms. Tatney has presented research at many conferences including the Society for Industrial and Organizational Psychologists' Annual Conference 2007 and 2008, Psi Chi Annual Conference 2007, and the Annual Celebration of Excellence in Students Conference 2008.