SELECT
DEVELOP
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HOGAN**SELECT**

ADVANTAGE

AN OFF-THE-SHELF SOLUTION FOR CANDIDATE SELECTION

TECHNICAL MANUAL

POWERED BY HOGAN

Hogan Advantage Technical Manual

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1 – INTRODUCTION

This technical manual outlines the development of the Hogan Advantage. The Hogan Advantage is a 74-item personality assessment that predicts performance on three competencies essential for success in many entry-level jobs. These performance competencies include Dependability, Composure, and Customer Focus.

In this manual, we describe these competencies and research linking them to performance in entry-level jobs. We present research that aligns the personality characteristics assessed by the Hogan Advantage to each performance criterion and strategies for applying data from previous studies to validate the assessment. Also, we discuss considerations for using Hogan Advantage results for various Human Resource Management applications.

1.1 Personality as a Predictor of Important Outcomes Personality assessment samples self-presentational behavior, or how a person portrays him or herself to others on the job. Using an assessment instrument for measurement purposes allows us to aggregate these behavioral samples, assign them numbers according to certain agreed-upon rules, and use these numbers to make predictions about a person's future behavior (Ghiselli, Campbell, & Zedeck, 1981). More importantly, personality measurement provides highly meaningful information, as previous research shows that personality predicts numerous work and non-work related outcomes. Recently, Hough and Oswald (2008) provided a summary of the value of applied personality assessment.

For example, personality predicts a number of major life outcomes, such as academic achievement, mortality, divorce, subjective well-being, and occupational attainment (O'Connor & Paunonen, 2007; Roberts, Kuncel, Shiner, Caspi, & Goldberg, 2007; Rothstein, Paunonen, Rush, & King, 1994; Steel, Schmidt, & Shulz, 2008). Research also demonstrates that personality predicts health-related behaviors including the use of drugs and alcohol (Bogg & Roberts, 2004; Cooper-Hakim & Viswesvaran, 2002; Paunonen, Haddock, Forsterling, & Keinonen, 2003; Roberts, Chernyshenko, Stark, & Goldberg, 2005). Illustrating the value of personality across contexts, Ozer and Benet-Martinez (2006) noted that, at an individual level, personality dispositions relate to happiness, physical and psychological health, spirituality, and identity. At an interpersonal level, the authors also found personality related to the quality of peer, family, and romantic relationships. Finally, at a social/institutional level, personality relates to occupational choice, satisfaction, performance, community involvement, criminal activity, and political ideology (Ozer & Benet-Martinez, 2006).

Additional research illustrates the value of personality for predicting work-related outcomes. For example, researchers consistently find that personality predicts overall job performance (e.g., Barrick, Mount, & Judge, 2001; Dudley, Orvis, Lebiecki, & Cortina, 2006; J. Hogan & Holland, 2003), task performance (Dudley et al., 2006; Hurtz & Donovan, 2000), expatriate performance (Mol, Born, Willemsen, & Van Der Molen, 2005) and performance in teams (Peeters, Van Tuijl, Rutte, & Reymen, 2006). Also, personality predicts a range of contextual performance variables including Organizational Citizenship Behaviors (OCBs), altruism, job dedication, interpersonal facilitation, and generalized compliance (Borman, Penner, Allen, & Motowidlo, 2001; Dudley et al., 2006; Hurtz & Donovan, 2000; LePine, Erez, & Johnson, 2002; Organ & Ryan, 1995).

Regarding specific work skills and individual competence, researchers report that personality predicts training performance and skill acquisition (Barrick & Mount, 1991; Barrick et al., 2001; Colquitt, LePine, & Noe, 2000), goal setting (Judge & Ilies, 2002; Steel, 2007), creativity and innovation (Hough, 1992; Feist, 1998; Hough & Dilchert, 2007), teamwork (Barrick, Mount, & Gupta, 2003; J. Hogan & Holland, 2003), and job and career satisfaction (Judge, Heller, & Mount, 2002; Ng, Eby, Sorensen, & Feldman, 2005). Among leaders and managers, personality shows significant correlations with overall managerial effectiveness, promotion, and managerial level (Hough, Ones, & Viswesvaran, 1998), as well as leader emergence and effectiveness (Bono & Judge, 2004; Judge, Bono, Ilies, & Gerhardt, 2002).

Organizations can use personality measures to identify employees likely to engage in Counterproductive Work Behaviors (CWBs), or behaviors that violate the norms of an organization and cause harm to the organization itself, specific members of the organization, or both (Berry, Ones, & Sackett, 2007; Gruys & Sackett, 2003). Personality-based integrity tests predict more specific negative outcomes such as theft, disciplinary actions, and absenteeism (Ones, Viswesvaran, & Schmidt, 1993, 2003).

In summary, personality assessment provides measurement capability for predicting a range of important outcomes at both the individual and organizational levels. Although some of these outcomes affect individual factors such as health and quality of life, others focus on group- and organizational-level factors such as teamwork and organizational productivity. We designed the Hogan Advantage to predict specific work-related outcomes across countries, languages, and cultures.

1.2 The Structure of Personality For personality assessment, the most important question is "*What should we measure?*" Historically, the answer

depends on a test author's personal interests (e.g., Locus of Control; Rotter, 1966), practical concerns (e.g., Minnesota Multiphasic Personality Inventory; Hathaway & McKinley, 1943), or theory (e.g., Myers-Briggs Type Indicator; Briggs-Meyers, McCaulley, Quenk, & Hammer, 1998; Thematic Apperception Test; Morgan & Murray, 1935). Multi-dimensional personality inventories developed during the 1940s and 1950s measured traits, or hypothetical structures believed to underlie differences in social behavior (cf. Allport, 1937). Early approaches to personality inventory construction led to more advanced test development strategies, and improved the quality and interpretability of the instruments.

Current thinking in personality assessment converges on the idea that most personality characteristics reflect five broad personality dimensions. The Five-Factor Model (FFM; cf. Digman, 1990; Goldberg, 1992; John, 1990, p. 72; McCrae & Costa, 1987), which emerged from fifty years of factor analytic research on the structure of observer ratings (cf. Norman, 1963; Thurstone, 1934; Tupes & Christal, 1961), suggests that we think about and describe others and ourselves (Goldberg, 1990) in terms of five themes:

I. ***Surgency/Extraversion*** - The degree to which a person is outgoing and talkative.

II. ***Agreeableness*** - The degree to which a person is rewarding to deal with and pleasant.

III. ***Conscientiousness*** - The degree to which a person complies with rules, norms, and standards.

IV. ***Emotional Stability*** - The degree to which a person appears calm and self-accepting.

V. ***Intellect/Openness to Experience*** - The degree to which a person seems creative and open-minded.

The FFM provides the starting point for several prominent personality inventories constructed within the last twenty years (e.g., NEO-PI: Costa & McCrae, 1992; Big Five Markers: Goldberg, 1992; IPIP: Goldberg, Johnson, Eber, Hogan, Ashton, Cloninger, & Gough, 2006; HPI: R. Hogan & Hogan, 1995, 2007; Personal Characteristics Inventory: Mount & Barrick, 2001; Inventario de Personalidad de Cinco Factores: Salgado & Moscoso, 1999). The five dimensions provide a useful taxonomy for classifying individual differences in social behavior (i.e., reputation). Evidence suggests that all existing multidimensional

personality inventories conform, with little difficulty, to these five dimensions (Wiggins & Pincus, 1992). Consequently, the FFM represents the dominant paradigm for current research in personality assessment (R. Hogan & Hogan, 2007).

The FFM rests on observers' descriptions of others. These observations form the basis for one's reputation, or how people describe coworkers or peers (R. Hogan, 1983). Reputations grow from social consensus regarding consistencies in a person's behavior, and develop from behavior during social and occupational interaction. These behaviors consist, at least in part, of actions designed by the individual to establish, defend, or enhance his or her identity or view of him or herself (cf. Goffman, 1958). Reputations are public, tell us about observable tendencies in behavior, can be measured reliably, and can be used to forecast future behavior (cf. Emler, 1990). Consequently, a person's reputation represents an invaluable source of information about work-related strengths and shortcomings; it also influences the direction of careers.

Despite the importance and widespread application of the FFM to personality measures, it is not without its critics. For example, Hough and her colleagues (Hough, 1992, 1998; Hough & Oswald, 2000; Schneider & Hough, 1995) have long argued that combining multi-faceted personality scales into larger factors ignores both important distinctions among the facets and relationships with other variables of interest such as job performance. Moreover, when the goal is to predict specific work behaviors, individual personality facets, or combinations of facets, may be more predictive than higher order, FFM scales (J. Hogan, Hogan, & Busch, 1984; J. Hogan & Hogan, 1989; Hough & Ones, 2002).

For example, Hough (1992) argued that the Conscientiousness scale of the FFM, while comprised of several individual personality facets, groups into two constituent factors relating to dependability and achievement. She argues that Conscientiousness is more predictive of specific work outcomes when examined at the facet level rather than as one overriding personality factor. Furthermore, Ones and colleagues (i.e., Ones & Viswesvaran, 1996; Ones, Dilchert, Viswesvaran, & Judge, 2007), demonstrate that compound personality variables, composed of facets from multiple FFM personality dimensions, exhibit high validities for predicting specific outcomes of interest such as ratings of stress tolerance or customer support. Ones, Viswesvaran, and Dilchert (2005) noted that the highest operational validities of single scales (.40s) are associated with measures assessing broad, compound personality characteristics such as integrity and customer service orientation. The authors conclude that the predictive

power of these broad personality constructs lies in the fact that they incorporate facets of multiple FFM dimensions.

As stated by J. Hogan and Roberts (1996), "the nature of the criteria dictates the choice of predictors and matching predictors with criteria always enhances validity" (p. 627). The authors argue that criteria are complex constructs, not specific educational skills. Complex criteria cannot be predicted by single narrow personality measures. Instead, combining multiple personality facets that align with specific work components into broad scales provides the best method for predicting job performance.

Providing further support for these ideas, Paunonen and colleagues spent ten years comparing the predictive power of narrow personality traits versus broad, FFM-level dimensions. In an early effort, Paunonen (1998) found that narrow personality facets and broad factors predicted most criterion variables, but the incremental validity of the facet measures beyond the factor measures was generally much larger than that of the factors beyond the facet measures. Based on these findings, he concluded that aggregating facet measures into a broader, factor-level measure could result in a loss of predictive accuracy due to the loss of trait-specific variance. In subsequent research, he translated this conclusion into a recommendation that professionals combine multiple trait-level personality measures to form a multivariate prediction strategy. The authors suggest that facet-level measurement enjoys both a predictive and an explanatory advantage compared to a single, factor-level personality assessment (Paunonen & Nicol, 2001).

Expanding on these research efforts, Ashton (1998) and Paunonen and Ashton (2001) found that narrow facets predict behavioral criteria better than broad factors because the facets account for large portions of criterion variance. Because the facets substantially increased the maximum prediction achieved by the factors, the authors proposed a more detailed approach to personality assessment than the use of the FFM dimensions alone. Paunonen et al. (2003) later took a cross-cultural approach to this research, examining the predictive accuracy of narrow and broad personality predictors on a variety of behavioral outcomes across Canada, England, Germany, and Finland. Consistent with earlier findings, their results indicated that the narrow traits accounted for more criterion variance than the broad personality factors. Most recently, O'Connor and Paunonen (2007) replicated these results in the prediction of academic performance.

These findings increased reliance on combining individual personality facets into scales aimed at predicting specific work outcomes. Using this approach, we developed the Hogan Advantage to predict work outcomes relating to three broad, universal competencies: Dependability, Composure, and Customer Focus.

1.3 Personality on the Global Stage Business writers and researchers alike recognize that competition on a global stage increasingly impacts the way modern businesses operate, organize, and perform (D'Aveni, 1989; Dunnette, 1998; Hamel & Prahalad, 1994). However, as organizations become more global, they require the ability to develop and employ Human Resource Management strategies across multiple geographic regions, countries, and languages. To help meet this need, we designed the Hogan Advantage to predict important individual differences in work behaviors across cultures.

Following the globalization of business, there is an increasing amount of research demonstrating the cross-cultural relevance of personality. Specifically, researchers investigated translations of a number of English-based personality measures (BFI: Schmitt, Allik, McCrae, & Benet-Martinez, 2007; FFPI: Rodriguez-Fornells, Lorenzo-Seva, & Andres-Pueyo, 2001; NEO-PI-R: McCrae & Allik, 2002; OPQ: Beaujouan, 2000; 16PF: Cattell, 2004) to demonstrate that their structures replicate across continents, countries, languages, and regions. Conclusions from this research demonstrate that personality measures represented by the FFM retain their applicability across borders. This accumulation of evidence supports the applicability and utility of personality assessment at a global level.

Although the FFM of personality developed initially from U.S.-based measures, several studies support this structure of personality in many other countries as well. Specifically, McCrae and colleagues demonstrated the replicability of the five-factor structure in countries throughout Europe and Asia (Allik & McCrae, 2004; McCrae & Costa, 1997; McCrae, Zonderman, Costa, & Bond, 1996; Schmitt, Allik, McCrae, & Benet-Martinez, 2007). We have noted similar results with analyses of data from the Hogan Personality Inventory (HPI; R. Hogan & Hogan, 2007). Equivalency analyses demonstrate that the structure of the HPI replicates across multiple languages and cultures, including Portuguese, Danish, French, German, Polish, Turkish, and Romanian (Hogan Assessment Systems, 2008). In cross-cultural research in Asia, researchers note this same pattern of support in both *imposed-etic* (i.e., U.S. measures adapted to China) and *emic* (i.e., Chinese measure used in China) assessments, suggesting that the original source of the measure does not greatly affect its applicability across other cultures (Church & Lonner, 1998). In fact, based on the wide support of the FFM structure across cultures, McCrae and Costa (1997) claim a biological basis for personality, which

they argue represents a human *universal*. R. Hogan (1983) originally argued this point of view with his socio-analytic theory of personality during the early 1980s.

In addition to examining the equivalence and relevance of FFM personality assessment across cultures, another important factor concerns group differences. Generally, examining group differences focuses on differences in personality dimensions across demographic groups such as gender, age, and ethnicity. In these efforts, research consistently demonstrates that personality measures result in no appreciable adverse impact across demographic groups, particularly when compared to other commonly used selection instruments such as interviews and cognitive ability tests (Foldes, Duehr, & Ones, 2008; Hough, Oswald, & Ployhart, 2001).

Another primary concern associated with personality assessments is response distortion, or "faking." Despite the concern expressed by some, evidence indicates that, when data are collected in business settings, faking does not adversely affect the validity of personality measures in predicting important work outcomes (J. Hogan, Barrett, & Hogan, 2007; Hough, 1998; Jackson, Wroblewski, & Ashton, 2000). Furthermore, J. Hogan, Barrett, and Hogan (2007) demonstrated that applicants cannot effectively alter their scores on personality assessments, even when highly motivated to do so.

Considering the applied value of personality in predicting a range of important business-related outcomes, as well as the robustness of these measures against the pitfalls of adverse impact and faking, it is advantageous for organizations to use personality assessment to predict meaningful job performance outcomes. In addition, evaluations of predictive effectiveness and operational validity of assessment inventories are essential to demonstrate business necessity. The next section describes the Hogan Personality Inventory (HPI), a reliable, valid, and well-established assessment instrument that serves as the foundation of the Hogan Advantage.

2 – THE HOGAN PERSONALITY INVENTORY

To predict work behaviors associated with Dependability, Composure, and Customer Focus, we initially reviewed research related to three long-standing and well-validated occupational scales derived from the Hogan Personality Inventory (HPI: R. Hogan & Hogan, 1995, 2007): (a) Stress Tolerance, (b) Service Orientation, and (c) Reliability. Each occupational scale is comprised of multiple personality facets derived from the seven primary scales of the HPI. In this chapter, we describe the HPI's primary scales and their constituent facets.

Validating any assessment instrument relies on accurate measurement. Measurement consists of "any procedure that assigns numbers systematically to characteristic features of people according to explicit rules" (Ghiselli, Campbell, & Zedeck, 1981). Professionals use these numbers to make predictions or to forecast future behavior(s). Assigning numbers in a systematic fashion to characteristics is a necessary, but not sufficient, requirement of any assessment tool. Every instrument should also provide evidence to support (a) the reliability of the instrument and (b) relationships between scores on the instrument and job-relevant behaviors or outcomes (Equal Employment Opportunity Commission, 1978). At a minimum, professionals should evaluate the reliability of assessments in terms of the degree to which (a) items or questions on a scale relate to one another (internal item consistency) and (b) results or scores remain stable over time (test-retest reliability).

Test publishers should document an assessment's ability to predict job-relevant behaviors or outcomes in credible scientific sources. The supporting evidence should include significant and interpretable relations between scores on the instrument and indices of job performance. Moreover, evidence should demonstrate that scores on the instrument predict job performance criteria critical to success in the job of interest, rather than an ability to predict performance outcomes unrelated to critical work or behaviors.

Assessment instruments should also be "fair," in that they should not discriminate unfairly based on age, gender, or race (Equal Employment Opportunity Commission, 1978). As such, professionals must validate procedures that result in adverse impact in accordance with the *Uniform Guidelines on Employee Selection Procedures* (Equal Employment Opportunity Commission; hereafter "*Uniform Guidelines*"). Unfortunately, many instruments currently used in applied contexts fail to meet the criteria outlined above (R. Hogan, Hogan, & Trickey, 1999). The HPI was the first measure of normal personality developed explicitly to assess the FFM in occupational settings. The

measurement goal of the HPI is to predict real-world outcomes. As such, it is an original and well-known measure of the FFM and considered a marker instrument for personality measures in English and other languages as well.

To illustrate the relationships between the HPI and other well-known personality assessments, Tables 2.1 through 2.4 present correlations between the HPI and other assessments of the FFM. Figure 2.1 shows median correlation coefficients that summarize HPI relations with Goldberg's (1992) Big-Five Markers (R. Hogan & Hogan, 2007), the Personal Characteristics Inventory (Mount & Barrick, 1995), the Inventario de Personalidad de Cinco Factores (IP/5F: Salgado & Moscoso, 1999), and the NEO PI-R (Goldberg, 2000).

Table 2.1 Correlations between Goldberg's Big-Five Markers and the HPI Scales

Scale	**ADJ**	**AMB**	**SOC**	**INP**	**PRU**	**INQ**	**LRN**
Factor I	.04	.55*	.44*	.31*	-.24*	.29*	-.03
Factor II	.13	-.11	.02	.56*	.23*	-.12	-.17*
Factor III	.10	.24*	-.26*	-.07	.36*	-.17*	-.08
Factor IV	.70*	.39*	-.04	.27*	.01	.28*	.11
Factor V	.05	.22*	-.04	-.01	.03	.33*	.35*

Note. N = 168. Table taken from the *HPI Manual* (R. Hogan & Hogan, 2007). Factor 1 = Surgency; Factor II = Agreeableness; Factor III = Conscientiousness; Factor IV = Emotional Stability; Factor V = Intellect; ADJ = Adjustment; AMB = Ambition; SOC = Sociability; INP = Interpersonal Sensitivity; PRU = Prudence; INQ = Inquisitive; LRN = Learning Approach. * $p < .05$, one-tailed; directional relationships hypothesized a priori.

Table 2.2 Correlations between the PCI Primary Scales and the HPI Scales

Scale	**ADJ**	**AMB**	**SOC**	**INP**	**PRU**	**INQ**
Extraversion	.04	.39*	.64*	.26*	-.09	.18*
Agreeableness	.50*	.25*	.09	.61*	.21*	-.03
Conscientiousness	.24*	.39*	-.06	.17*	.59*	.08
Stability	.69*	.59*	-.02	.46*	.25*	.06
Openness	.12	.36*	.15	.17*	-.05	.57*

Note. N = 154. ADJ = Adjustment; AMB = Ambition; SOC = Sociability; INP = Interpersonal Sensitivity; PRU = Prudence; INQ = Inquisitive. * $p < .05$.

Table 2.3 Correlations between the IP/5F and the HPI Scales

Scale	ADJ	AMB	SOC	INP	PRU	INQ
Extraversion	.24*	.60*	.62*	.35*	.04	.41*
Agreeableness	.22*	-.12	-.10	.37*	.25*	-.10
Conscientiousness	.22*	.35*	.08	.30*	.49*	.19*
Stability	-.66*	-.50*	-.16*	-.31*	-.32*	-.26*
Openness	.11	.44*	.51*	.25*	-.15*	.69*

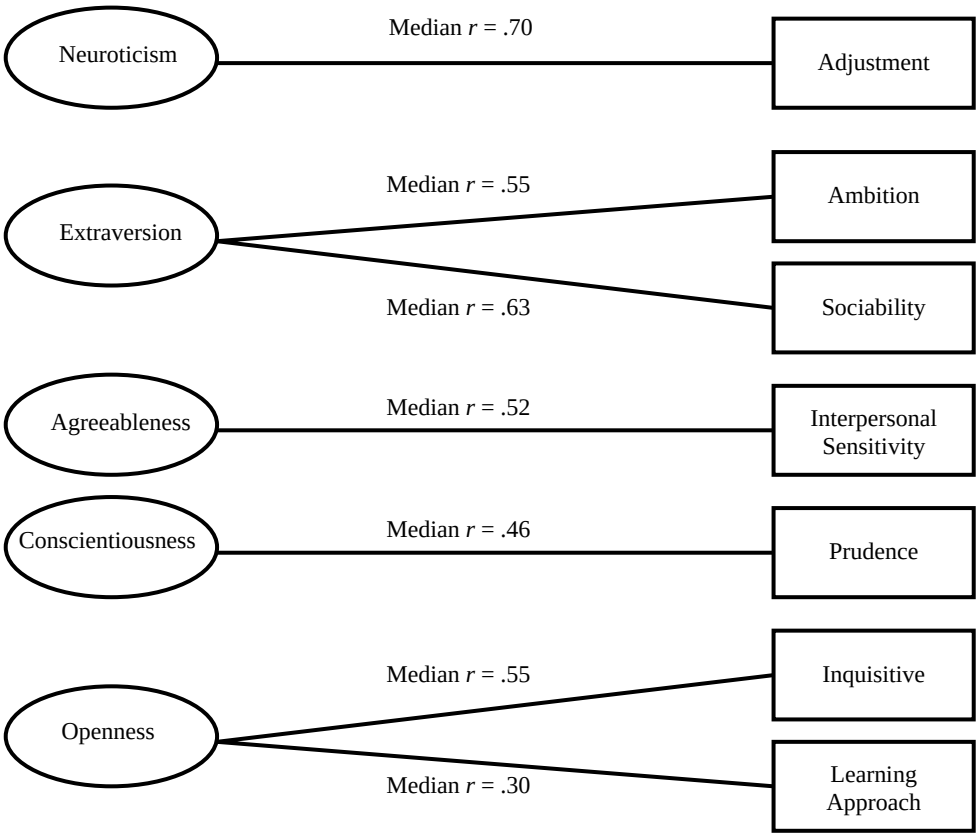
Note. N = 200. ADJ = Adjustment; AMB = Ambition; SOC = Sociability; INP = Interpersonal Sensitivity; PRU = Prudence; INQ = Inquisitive. * $p < .05$.

Table 2.4 Correlations between the NEO-PI-R and the HPI Scales

Scale	ADJ	AMB	SOC	INP	PRU	INQ	LRN
Extraversion	.16*	.54*	.63*	.44*	-.06	.22*	.08*
Agreeableness	.31*	-.12*	-.24*	.47*	.46*	-.20*	-.08*
Conscientiousness	.24*	.37*	-.05	.08	.42*	.05	.16*
Neuroticism	-.72*	-.53*	-.08*	-.27*	-.22*	-.15*	-.17*
Openness	.01	.20*	.38*	.19*	-.31*	.52*	.24*

Note. N = 679. ADJ = Adjustment; AMB = Ambition; SOC = Sociability; INP = Interpersonal Sensitivity; PRU = Prudence; INQ = Inquisitive; LRN = Learning Approach. * $p < .05$.

Figure 2.1 Relationships between FFM Inventories and the HPI Scales



Note. Median correlation coefficients summarize HPI relations with the NEO PI-R (Goldberg, 2000), Goldberg's (1992) Big-Five Markers (R. Hogan & Hogan, 2007), Personal Characteristics Inventory (Mount & Barrick, 2001), and the Inventario de Personalidad de Cinco Factores (Salgado & Moscoso, 1999). The coefficient ranges are as follows: Adjustment/Emotional Stability/Neuroticism (.66 to .72); Ambition/Extraversion/Surgency (.39 to .60); Sociability/Extraversion/Surgency (.44 to .64); Interpersonal Sensitivity/Agreeableness (.37 to .61); Prudence/Conscientiousness (.36 to .59); Inquisitive/Openness/Intellect (.33 to .69); Learning Approach/Openness/Intellect (.24 to .35). Reprinted with permissions from the authors. All rights reserved.

2.1 Description of the HPI

- Based on the FFM, development of the HPI began in the late 1970s, with construction and validation conducted in accordance with professional standards and the *Uniform Guidelines*. In terms of instrument development, an initial pool of 420 items was refined using factor analysis and empirical validation procedures to assign 206 items to seven primary scales.

- Favorable reviews of the HPI appear in the Buros Institute of Mental Measurements, the 13th edition of the Mental Measurements Yearbook (Lobello, 1998), and the British Psychological Society Psychological Testing Centre Test Reviews (Creed & Shackleton, 2007).

- HPI norms include data from over 150,000 working adults and job applicants from a variety of industry sectors including healthcare, military services, transportation, protective services, retail, manufacturing, and hospitality. This normative sample is representative of 14 of the 23 U.S. Department of Labor occupational categories.

- Over 250 validation studies, evaluating occupational performance across jobs and industries, have used the HPI. Jobs studied represent 95% of the industry coverage of the Dictionary of Occupational Titles (U.S. Department of Labor, 1991).

- Meta-analyses of HPI scales indicate that the estimated true scale validities for predicting job performance are as follows: Adjustment (.43), Ambition (.35), Interpersonal Sensitivity (.34), Prudence (.36), Inquisitive (.34), and Learning Approach (.25). These peer-reviewed results appear in the *Journal of Applied Psychology* (J. Hogan & Holland, 2003).

- To date, research indicates no adverse impact for the HPI on protected racial/ethnic, gender, or age groups.

- Recent research indicates that real job applicants who completed the HPI as part of the job application process did not/could not "fake" their scores on a second occasion having been rejected the first time (J. Hogan, Barrett, & Hogan, 2007).

- The HPI incorporates the FFM with an internal factor structure supporting seven scales. The test-retest reliabilities range from .69 to .87. The 2007 *Hogan Personality Inventory Manual* (3rd edition) documents the background, development, and psychometric properties of the inventory.

- HPI scales demonstrate adequate psychometric qualities (Lobello, 1998). Items retained in the final battery predict significant non-test behavior. There is no item overlap between the primary scales and the validity scale. Empirical validation research conducted over the last 20 years provides a firm understanding of construct validity and the nature and range of job performance prediction. Overall, the HPI is a well-validated instrument that predicts job performance across occupations and organizations (Axford, 1998; J. Hogan & Holland, 2003).

2.2 Constructs Measured We define the HPI scales (and associated FFM constructs) as follows:

The **Adjustment** scale reflects the degree to which a person is steady in the face of pressure, or conversely, moody and self-critical (FFM: Emotional Stability).

The **Ambition** scale evaluates the degree to which a person seems leader-like, status seeking, and achievement-oriented (FFM: Extraversion).

The **Sociability** scale assesses the degree to which a person needs and/or enjoys social interaction (FFM: Extraversion).

The **Interpersonal Sensitivity** scale reflects social sensitivity, tact, and perceptiveness (FFM: Agreeableness).

The **Prudence** scale concerns self-control and conscientiousness (FFM: Conscientiousness).

The **Inquisitive** scale reflects the degree to which a person seems imaginative, adventurous, and analytical (FFM: Intellect/Openness).

The **Learning Approach** scale reflects the degree to which a person enjoys academic activities and values education as an end in itself (FFM: Intellect/ Openness).

2.3 Homogenous Item Composites (HICs) During the development of the HPI, it appeared that each scale could be broken down into a set of related facets. Because the items in these facets clustered together, they were named Homogenous Item Composites (Zonderman, 1980), or HICs. For each HPI scale, the items comprising each HIC represent themes within the larger construct. The number of "facets" comprising each scale varies, ranging from four (Learning Approach) to eight (Adjustment).

In the spring of 1992, Hogan conducted factor analyses on the HIC correlation matrix. Analyses indicated that eight factors comprise the matrix, forming the basis of the HPI scales. Because a few HICs had substantial loadings on two factors, we used this information to balance the number of items on each scale by assigning HICs accordingly. The third edition of the HPI contains 44 HICs, with no overlap between items, HICs, and scales. Table 2.5 presents the HPI scales, HICs underlying each scale, and descriptions and sample items for each HIC.

To develop predictive algorithms for each Hogan Advantage competency, we combined HIC-level data from the Hogan archive with criterion performance ratings for the selected competencies.

Table 2.5 HPI Scales, HICs, Descriptions, and Sample Items

HPI Scale	**Description**	**Sample Item**
Adjustment		
• Empathy	Concern for others	I dislike criticizing people, even when they need it
• Not Anxious	Absence of worry	Deadlines don't bother me
• No Guilt	Absence of regret	I rarely feel guilty about the things I have done
• Calmness	Not volatile	I keep calm in a crisis
• Even Tempered	Patience	I hate to be interrupted
• No Complaints	Complacence	I almost never receive bad service
• Trusting	Belief in others	People really care about one another
• Good Attachment	Good relations with authority	In school, teachers liked me
Ambition		
• Competitive	Desire to win	I want to be a success in life
• Self Confident	Self-assurance	I expect to succeed at everything
• Accomplishment	Personal effectiveness	I am known as someone who gets things done
• Leadership	Leadership tendencies	In a group I like to take charge of things
• Identity	Satisfaction with one's life	I know what I want to be
• No Social Anxiety	Social self-confidence	I don't mind talking in front of a group of people

Table 2.5 HPI Scales, HICs, Descriptions, and Sample Items (Continued)

Sociability		
• Likes Parties	Affability	I would go to a party every night if I could
• Likes Crowds	Affiliativeness	Being part of a large crowd is exciting
• Experience Seeking	Needs variety	I like a lot of variety in my life
• Exhibitionistic	Showing off	I like to be the center of attention
• Entertaining	Being witty and engaging	I am often the life of the party
Interpersonal Sensitivity		
• Easy to Live With	Being easy-going	I work well with other people
• Sensitive	Being considerate	I always try to see the other person's point of view
• Caring	Social sensitivity	I am sensitive to other people's moods
• Likes People	Companionable	I enjoy just being with other people
• No Hostility	Tolerant	I would rather not criticize people
Prudence		
• Moralistic	Self-righteousness	I always practice what I preach
• Mastery	Diligent	I do my job as well as I possibly can
• Virtuous	Perfectionism	I strive for perfection in everything I do
• Not Autonomous	Conformity	Other people's opinions of me are important
• Not Spontaneous	Planful	I always know what I will do tomorrow
• Impulse Control	Self-disciplined	I rarely do things on impulse
• Avoids Trouble	Professed probity	When I was in school, I rarely gave the teachers any trouble

Table 2.5 HPI Scales, HICs, Descriptions, and Sample Items (Continued)

Inquisitive		
• Science	Analytical	I am interested in science
• Curiosity	Investigative	I have taken things apart just to see how they work
• Thrill Seeking	Stimulus seeking	I would like to be a race car driver
• Intellectual Games	Playful cognition	I enjoy solving riddles
• Generates Ideas	Ideational fluency	I am known for having good ideas
• Culture	Cultural interests	I like classical music
Learning Approach		
• Good Memory	Powers of recall	I have a large vocabulary
• Education	Academic talent	As a child, school was easy for me
• Math Ability	Numerical talent	I can multiply large numbers quickly
• Reading	Verbal talent	I would rather read than watch TV
Other		
• Self Focus	Introspection	I often think about the reasons for my actions
• Impression Management	Reputation control	I often wonder what other people are thinking of me
• Appearance	Public self-consciousness	My success depends on how others perceive me

3 – REPORT STRUCTURE

3.1 Using Personality to Predict Competencies As organizations adapt to a global market, they often struggle to become more flexible and responsive, leading to strategic changes to processes and structure. Such strategic changes include an increasing reliance on work teams and flattening layers of management (Ashkenas, Ulrich, Jick, & Kerr, 1995; Howard, 1995; Keidel, 1994). As a result, traditional job analysis procedures do not serve human capital interventions as effectively as before (Barnes-Nelson, 1996; Olian & Rynes, 1991; Sanchez, 1994), leaving many organizations to rely on competency models as a more contemporary basis for their Human Resource Management applications.

The work of David McClelland (1973) provides the driving force behind the widespread growth of competencies. McClelland argued that aptitude tests, almost universally used to predict performance, do not serve their intended purpose particularly well and are prone to cultural biases. McClelland also noted that other traditional measures, such as examination results and references, are equally poor at predicting success on the job. Based on these limitations, McClelland suggested that individual competence might provide a more promising alternative for forecasting effectiveness. These competencies represent underlying individual characteristics that enable superior performance in a given job, role, or context.

As the popularity of competencies grows, so do their applications. The 1980s witnessed a growth in competency applications for predicting long-term success in managerial jobs (McClelland & Boyatzis, 1982) and determining characteristics that enable managers to be effective in various leadership roles (Boyatzis, 1982). These applications led to the development of competency-based selection tools such as behavioral event interviews (Boyatzis, 1994; McClelland, 1998; Spencer, McClelland, & Spencer, 1994). In turn, these advances provided the catalyst for development of high-level management and leadership competency models (Hollenbeck, McCall, & Silzer, 2006). Assessments gained even greater popularity in the applied world as organizations discovered that well-designed competency-based assessments could make important contributions to the selection and development of high potential individuals (McClelland, 1994).

Most recently, we see the application of competencies in such areas as emotional intelligence (Boyatzis, 2007; Boyatzis & Sala, 2004), coaching others to overcome dysfunctional behavior (Boyatzis, 2006), and linking performance with intelligence and personality (Heinsman, de Hoogh, Koopman, & van Muijen, 2007). Competencies appear in educational, training, employment, and

assessment contexts, where the fundamental question involves identifying individual characteristics that lead to success (Boyatzis, Stubbs, & Taylor, 2002; Rubin et al., 2007; Spencer & Spencer, 1993).

Consistent with this trend, we developed an entry-level competency model for predicting performance in non-managerial and non-professional jobs. Then, we developed the Hogan Advantage to forecast and predict these competencies. This report provides a technical summary of the developmental research behind the Hogan Advantage. The research conforms to guidelines and practices outlined in *The Principles for the Validation and Use of Personnel Selection Procedures* (Society for Industrial and Organizational Psychology, 2003; hereafter "*Principles*"). In areas where the *Principles* prove vague or inapplicable, we refer to the broader scientific and professional literature.

3.2 Entry-level Competency Model In creating the Hogan Advantage, we first identified the competencies most critical for success across entry-level jobs. Entry-level jobs include the five job families described below.

- The *Operations and Trades* job family includes skilled craft workers, semi-skilled operatives, and unskilled laborers. In these types of jobs, employees primarily gain job knowledge through on-the-job training and experience. Individuals require little prerequisite knowledge or skill to enter these jobs.

- The *Technicians and Specialists* job family includes fields of specialization such as engineering, machine trades, and processing. In such positions, employees work to solve practical problems, often under the direction of a professional. Because these jobs require specialized knowledge and skill to perform activities, personnel who work in these occupations usually complete two years of college, attend a technical school, or learn thorough on-the-job training certification.

- The *Sales and Customer Support* job family includes positions where employees are responsible for interacting with prospects and clients to sell and/or support products and services. These employees rely upon their interpersonal skills and communication techniques to meet their customers' needs, and provide courteous and helpful service to customers after the sale.

- The *Administrative and Clerical* job family includes positions that involve planning, directing, or coordinating support services, preparing/compiling documents, and maintaining accounts, records, and

files. These employees engage in a variety of non-manual activities that can include distributing mail, handling information requests, operating telephone equipment, preparing correspondence, arranging conference calls, scheduling meetings, and providing other office support services.

- The *Service and Support* job family includes police, firefighters, recreation and amusement workers, and other personal service providers. This category includes positions where employees perform protective and non-protective services to others.

To identify competencies critical for success across each of these five job families, we relied on published research outlining critical work components across entry-level jobs, and archival data from Hogan's job analysis instrument, the Job Evaluation Tool (JET). The JET includes a component that provides a comprehensive list of competencies that appear in, or can be translated from, major taxonomic sources, including the "Great Eight" (Bartram, 2005). This section, called the Competency Evaluation Tool (CET), asks Subject Matter Experts (SMEs) to indicate the extent to which each of 56 listed competencies relates to successful performance in the job or job family under study. Raters evaluate each competency using a five-point scale ranging from "0" (*Not associated with job performance*) to "4" (*Critical to job performance*). Generally, competencies considered critical are those that receive mean ratings greater than "3" (*Important to performance*). SME ratings provide a basis for developing structural models to compare job domains and competencies across jobs within and across families (J. Hogan, Davies, & Hogan, 2007). The CET appears in Appendix A.

Of all the CET competencies, we identified three that (a) received significant attention in previous research examining critical performance competencies in entry-level jobs, and (b) were rated as "important" or "critical" across entry-level jobs by at least 75% of respondents. These three competencies aligned with Dependability, Composure, and Customer Focus. The following sections define each of these competencies and summarize the research literature examining the relationships between personality variables and job performance for each competency.

3.3 Dependability We define Dependability as the degree to which a person will follow established rules and procedures, make work and work-related activity a priority, accept supervision, and follow through on assigned tasks and responsibilities. Persons high on Dependability tend to be hard working and

reliable. Persons with low scores on Dependability are more likely to be careless, uneven in their job performance, and potentially rebellious or insubordinate.

Although numerous researchers (e.g., Sackett, Burris, & Callahan, 1989; Sackett & Decker, 1979; Sackett & Harris, 1984; Sackett & Wanek, 1996) have examined dependability, R. Hogan and Hogan (1995) are among the first to do so through personality assessment, using the HPI's Reliability occupational scale (J. Hogan & Hogan, 1989). The Dependability scale represents a syndrome of inter-related personality characteristics associated with successful performance in the area of organizational citizenship. Researchers apply other terms (e.g., honesty, integrity, trustworthiness, reliability) to describe this construct (Wanek, Sackett, & Ones, 2003). As such, we use these terms interchangeably.

Researchers (e.g., Hough & Schneider, 1996; Imber, 1973; Rempel, Holmes, & Zanna, 1985) investigating individual determinants of Dependability indicate that the construct links to several components such as trust and predictability. In addition, examining "generic work behaviors," Hunt (1996) outlined nine performance dimensions that contribute to performance for nearly any entry-level job: (a) adherence to confrontational rules, (b) industriousness, (c) thoroughness, (d) schedule flexibility, (e) attendance, (f) off-task behavior, (g) unruliness, (h) theft, and (i) drug use. A cursory review of these dimensions reveals that all relate to integrity and dependably performing minimal work requirements.

Dependability arises from organizational citizenship behavioral themes including acting with integrity, earning trust, and consistently producing quality work. Accordingly, researchers have worked to identify relationships between FFM personality dimensions and Dependability. Collectively, this research indicates a strong relationship with FFM Conscientiousness (Hogan & Ones, 1997). Other FFM dimensions also influence Dependability, although these relationships are more complex and, at times, more ambiguous than are links to Conscientiousness.

Research examining the influence of personality on Dependability indicates a strong positive relationship with measures of Conscientiousness (being rule-compliant, careful, and thoughtful). For example, in a recent meta-analysis of 44 unique personality instruments, Foldes, Duehr, and Ones (2008) assigned personality scales across these assessments to FFM dimensions using a working taxonomy developed by Hough and Ones (2001). As noted by Foldes et al., dependability and cautiousness/impulse control represent facets with strong

and positive influences on Conscientiousness. These facets alone illustrate the obvious linkages between Conscientiousness and Dependability.

In the most recent review of the literature, Berry, Sackett, and Wiemann (2007) noted that Conscientiousness demonstrates the strongest and most consistent relationship with traditional measures of integrity. For example, J. Hogan and Brinkmeyer (1997) examined responses to items across two integrity-related instruments, the HPI Reliability occupational scale (R. Hogan & Hogan, 1995) and the Reid Report (Reid, 1967). On one hand, all items from the HPI Reliability occupational scale loaded on one factor. On the other hand, items from the Reid Report loaded onto three factors, dealing with punitive attitudes, admissions, and drug use. However, when the authors conducted a second-level confirmatory factor analysis on all four factor scores, results indicated that all loaded on a single factor – Conscientiousness.

Subsequent research conducted by Wanek et al. (2003) largely confirms these findings. Specifically, in their analyses of 798 items from seven different integrity tests, the authors identified 23 distinct underlying composite variables. These variables loaded onto four broader components: (a) antisocial behavior, (b) socialization, (c) positive outlook, and (d) orderliness/diligence. Using these four components, the authors computed correlations with the FFM scales. Although results indicated relationships with Emotional Stability and Agreeableness, Conscientiousness demonstrated the most consistent relationships across all four factors. These results, combined with the research previously described, suggest that Dependability exists as a hierarchical construct composed of an overall Conscientiousness factor and other facets of personality from across the FFM dimensions (J. Hogan & Brinkmeyer, 1997; Wanek et al., 2003). Taken together, this body of research indicates that responsible and cautious individuals who avoid trouble and act out of a sense of duty (i.e., highly conscientious individuals) are likely to be perceived as more dependable than less responsible and impulsive individuals.

Although Conscientiousness provides the strongest, most positive, and direct link to Dependability, this dimension alone does not account for all variance and does not account for as much variance in CWBs or job performance outcome variables as does integrity. In fact, partialling Conscientiousness out of integrity has only a small effect on integrity test validity, but doing the converse reduces the criterion-related validity of Conscientiousness to near zero (Murphy & Lee, 1994; Ones, 1993). In other words, although Conscientiousness primarily drives Dependability, it is not the *only* factor that plays a role. Illustrating this point, three of the four broad components identified by Wanek et al. (2003) reference

personality, with two of those describing dimensions other than Conscientiousness.

Consistent with the above argument, Wanek et al.'s (2003) "socialization" factor included achievement orientation, locus of control, and extraversion/introversion as components. To this point, Foldes et al. (2008) also identified sociability as a facet of Extraversion in their research. As such, we consider sociability as one aspect of Extraversion (being outgoing, talkative, and assertive) related to Dependability. However, unlike the strong and positive association with Conscientiousness, it appears from the literature that the relationship of Extraversion to Dependability may exist at a lower level in the hierarchy previously described (Berry et al., 2007). In addition, it is likely that the relationship between Dependability and Extraversion runs in the opposite direction from Conscientiousness, with others rating more social and experience-seeking employees as less dependable than those not interested in socializing and more interested in getting the job done.

The third of Wanek et al.'s (2003) factors referencing personality, "positive outlook," includes temptations and impulse control. Additionally, Foldes et al. (2008) identified curiosity, a highly similar construct, as a facet of Openness to Experience. Based on these findings, we consider positive outlook a facet of Openness to Experience (being intellectually curious and preferring variety) that relates to Dependability. It also appears that the relationship between Openness to Experience and Dependability may mirror that with Extraversion, existing at a lower hierarchical level (Berry et al., 2007). Judging by these component factors, the Openness to Experience – Dependability relationship is also likely to be negative, with others rating curious employees craving variety as less dependable than less inquisitive employees who are more comfortable in a consistent environment. Considering the above discussion as well, it appears from the existing literature that Dependability crosses several personality dimensions, with being careful and thoughtful (FFM Conscientiousness), *not* being overly sociable (FFM Extraversion), and *not* being overly curious nor craving variety as significant predictors of employee Dependability.

Researchers use a number of different means to predict and otherwise measure Dependability, including polygraphs, overt measures of integrity, and personality-based assessments. Professionals used polygraphs prior to the late 1980s to screen job applicants for dishonesty. However, after researchers found unsatisfactory validity evidence for these instruments and the U.S. Congress passed the Employee Polygraph Protection Act of 1988, prohibiting most private employers from using these devices, their use faded quickly (Sackett et al., 1989;

Yap, 2008). Following these events, researchers developed a number of overt integrity tests designed to assess information about employee wrongdoing (Sackett et al., 1989). In fact, a literature review by Ones and Viswesvaran (1998) describes over 40 integrity tests, including the London House Personnel Selection Inventory (PSI; McDaniel & Jones, 1988), Stanton Survey (SSI; Harris & Dillon, 1989), and Reid Report (Reid, 1967). Overt integrity tests commonly include two sections, one assessing the individual's beliefs and attitudes about theft, and the second seeking admissions of theft and wrongdoing (Berry et al., 2007; Yap, 2008).

Although overt integrity tests do predict CWBs and job performance (Ones, Viswesvaran, & Schmidt, 1993; Sackett & Wanek, 1996), they suffer from two problems. The first concerns group differences. Specifically, Ones and Viswesvaran (1998) examined gender, age, and race differences on overt integrity tests using a sample of over 700,000 job applicants. Their findings indicate that females score higher on these tests than males, with smaller differences also noted for age (applicants under 40 vs. those 40 and older) and race/ethnicity (comparing mean scores for Blacks, Hispanics, Asians, and Alaskan Natives/American Indians against those of Whites). The second and more obvious problem concerns the complete transparency of overt integrity test items. Employees may intentionally fake their responses on these instruments, providing desirable responses to obvious items such as "I stole more than $5,000 from my last employer." Research supports the propensity to fake on overt integrity tests, especially when individuals complete such assessments as part of pre-employment screening. These researchers also noted that people more easily fake overt integrity tests than personality assessments (Alliger & Dwight, 2000; Hurtz & Alliger, 2002; Ryan & Sackett, 1987). Considering this research, as well as research by J. Hogan, Barrett, and Hogan (2007) showing that individuals are largely ineffective in faking personality assessments, personality-based assessments may prove more effective than overt integrity tests as a means of predicting and measuring Dependability.

As opposed to overt integrity tests, covert or personality-based instruments combine responses across specific facets of personality dimensions to predict dishonest behaviors. These instruments closely resemble normal-range personality assessments. Compared to overt integrity tests, however, they are considerably broader in focus and not explicitly aimed at theft or other CWBs (Berry et al., 2007). Commonly used personality-based integrity tests include the Personnel Reaction Blank (Gough, 1972), the PDI Employment Inventory (PDI-EI; Personnel Decisions Inc., 1985), the Honesty-Humility (H-H) scale from the

HEXACO personality model (Lee, Ashton, & de Vries, 2005; Marcus, Lee, & Ashton, 2007), and the Hogan Reliability scale (J. Hogan & Hogan, 1989).

Specifically, the Hogan Reliability scale combines facets of the Adjustment (FFM Emotional Stability), Interpersonal Sensitivity (FFM Agreeableness), and Prudence (FFM Conscientiousness) scales from the Hogan Personality Inventory (HPI; R. Hogan & Hogan, 2007). As defined by the authors, the Reliability occupational scale identifies individuals likely to be honest, dependable, and responsive to supervision. Individuals who score high on the scale have a reputation for being efficient, organized, agreeable, and cooperative. In contrast, others view individuals who score low on the scale as rude, bold, and as having active imaginations. Following initial development, J. Hogan and Hogan (1989) validated this scale in 13 concurrent validation studies. Results of these studies indicated that the Reliability scale predicted a range of objective and subjective conscientious/dependability-oriented performance criteria across jobs. Woolley and Hakstian (1992) examined the construct validity of the Reliability occupational scale by correlating scale scores against those from the Reid Report (Reid, 1967), the Personnel Reaction Blank (Gough, 1972), and the PDI Employment Inventory (PDI-EI; Personnel Decisions Inc., 1985). Results provided further convergent and discriminant validity evidence for the Reliability scale, with consistently higher correlations between the personality-based instruments compared to those between the Reliability scale and the Reid report. More recently, Yap (2008) compared the Reliability scale against two other integrity measures for predicting CWBs and job performance. Of the three integrity measures, the Reliability scale best predicted CWBs, and effectively predicted a range of job performance variables (Yap, 2008).

Research shows that both overt and personality-based integrity scales predict multiple performance outcomes, such as overall job performance, poor work attitudes, illegal drug use, and theft (Berry et al., 2007; J. Hogan & Hogan, 1989; Ones & Viswesvaran, 2001a; Ones et al., 1993). Schmidt and Hunter (1998) identified integrity tests as the personnel selection method with the greatest incremental validity in predicting job performance over measures of cognitive ability. These results are not surprising as CWBs relate to other job performance measures such as supervisor judgments about overall job performance (Borman, White, & Dorsey, 1995; Borman, White, Pulakos, & Oppler, 1991; Colquitt, Scott, & LePine, 2007; Rotundo & Sackett, 2002) and OCBs (Dalal, 2005; Dudley, Orvis, Lebiecki, & Cortina, 2006; Sackett, Berry, Wiemann, & Laczo, 2006).

Beyond these findings, results from recent meta-analyses support the validity of measures of integrity and Dependability. For instance, Ones (1992) estimated the

mean criterion-related validity of the Hogan Reliability scale in predicting CWBs at .45. In a later and more extensive effort examining 665 validity coefficients across 576,460 data points, Ones et al. (1993) estimated the mean operational validity of integrity tests for predicting supervisory job performance ratings at .41. The authors estimated the mean operational validity of predicting CWBs at .47 (Ones et al., 1993).

In summary, research demonstrates that measures relating to Dependability are predictive of multiple work outcomes. Hogan's client research reinforces these finding as SMEs completing the JET for entry-level jobs rate Dependability as "critical for performance" 72% of the time and either "important" or "critical" 96% of the time. These results, along with our review of previous research, support including Dependability in our entry-level competency model.

3.4 Composure We define Composure as the degree to which an employee can handle stress and pressure without becoming upset or emotional. Persons with high scores on Composure tend to remain calm, relaxed, and focused on their job even under pressure. Persons with low scores on Composure are more likely to become visibly upset. They tend to become easily frustrated, nervous, and irritable, requiring extra attention and reassurance.

Among other researchers, R. Hogan and Hogan (1995) pioneered personality-based research in this area using the HPI Stress Tolerance occupational scale. In addition to this effort, prior research on coping strategies (DeLongis & Holtzman, 2005; O'Brien & DeLongis, 1996; Penley & Tomaka, 2002) and employee burnout (Ghorpade, Lackritz, & Singh, 2007; Zellars, Perrewe, & Hochwarter, 2000) indicates that unique combinations of personality characteristics may facilitate or hinder an individual's ability to handle stress effectively (Lau, Hem, Berg, Ekeberg, & Torgesen, 2006; Tyssen et al., 2007; Vollrath & Torgesen, 2000).

As such, Composure does not represent a single, homogeneous personality construct, but a pattern of dimensions required for jobs characterized by high levels of occupational stress. Applicants who display these unique combinations of personality dimensions are likely to respond to stress through positive, task-focused behavior. Conversely, applicants who do not exhibit these personality characteristics are more likely to respond to stress using more emotional or avoidant behavior (Lee-Baggley, Preece, & DeLongis, 2005). By selecting applicants who are more resistant to the negative effects of stress, organizations can enhance performance (Judge & Bono, 2001; Witt, Andrews, & Carlson, 2004) and decrease negative outcomes such as increased healthcare costs (Grant &

Langan-Fox, 2006) associated with increased employee strain (Zellars, Perrewe, Hochwarter, & Anderson, 2006), emotional exhaustion (Bakker, Van Der Zee, Lewig, & Dollard, 2006), and burnout (Tokar, Fischer, & Subich, 1998).

Previously, researchers (e.g., Kim, Shin, & Umbreit, 2007; Miller, Griffin, & Hart, 1999; Zakay, 1984) sought to understand how various individual and situational determinants contributed to occupational stress. Motowidlo, Packard, and Manning (1986) identified 45 stressful events and job conditions in a sample of nurses. Based on ratings provided by a subsequent sample of nurses, their findings indicated that several individual factors correlated significantly with self-reported perceptions of stressful events, subjective stress, depression, and hostility. These individual components included: (a) sensitivity, (b) warmth, (c) consideration, (d) tolerance, (e) concentration, (f) composure, (g) perseverance, and (h) adaptability. Based on these findings, it becomes apparent that personal characteristics represent important influences on one's ability to remain composed and perform effectively under stress.

Accordingly, researchers attempted to identify relationships between FFM personality scales and Composure. Collectively, their research indicates a strong relationship between FFM Emotional Stability and stress tolerance, with more complex and subtle relationships for other personality dimensions.

Most studies investigating the impact of personality on Composure find strong and positive relations between measures of Emotional Stability (being calm, even-tempered, and resilient) and stress tolerance (Besser & Shackelford, 2007; Kling, Ryff, Love, & Essex, 2003; Perkins & Corr, 2006; Vasilopoulos, Cucina, & Hunter, 2007). Specifically, research indicates that individuals with lower scores on Emotional Stability experience higher perceptions of stress (Conrad & Matthews, 2008; Tyssen et al., 2007) and threat (Shewchuk, Elliott, MacNair-Semands, & Harkins, 1999) than do individuals with more emotionally stable profiles. In turn, everyday coping strategies and individual outcomes reflect these differences in Emotional Stability. For example, Grant and Langan-Fox (2006) found that, in combination with other FFM personality dimensions, high Emotional Stability scores predicted low levels of perceived stress, poor physical health, job dissatisfaction, and high levels of task-focused coping in a sample of over 200 managers. Conversely, research indicates that low scorers on Emotional Stability report distress, worry, and emotionally focused coping (Matthews et al., 2006). Perhaps because of these perceptions of distress and worry, research indicates negative relations between Emotional Stability assessments and two key markers of employee burnout – emotional exhaustion and depersonalization (Bakker et al., 2006; Ghorpade et al., 2007). Together, these results indicate that

emotionally stable individuals are consistently better able to cope with stress and its negative effects than are individuals who are more anxious, prone to worry, and excitable.

Research on the remaining FFM dimensions indicates mixed effects for Composure. For example, some researchers note a positive relationship between Conscientiousness (being rule-compliant, careful, and thoughtful) and Composure (Ghorpade et al., 2007; Grant & Langan-Fox, 2006; Zellars et al., 2006). In general, these studies show that Conscientiousness buffers employees against stress (Tyssen et al., 2007; Vollrath & Torgersen, 2000; Zellars et al., 2006) and enhances task-focused coping mechanisms (Matthews et al., 2006; Shewchuk et al., 1999). Although these findings suggest a positive relationship between Conscientiousness and stress tolerance, other research indicates a more complex relationship between these constructs. For example, Miller et al. (1999) used a framework of occupational stress research to investigate the effects of personality on organizational health. The authors found that Conscientiousness did not influence employee well-being or perceptions of the work environment within this framework. Other researchers note that high Conscientiousness may actually lead to depressive symptoms in stressed employees (Vearing & Mak, 2007). Considering this research, it appears that the relationship between Conscientiousness and stress tolerance may not be straightforward. Instead, Conscientiousness may influence Composure and associated performance outcomes through interactions with other constructs rather than through simple cause and effect mechanisms (Witt et al., 2004).

Existing research on the relationship between Extraversion (being outgoing, talkative, and assertive) and Composure provides similar results. Some researchers theorize that Extraversion exerts a "buffering effect" between stressors and perceived stress (Hudiburg, Pashaj, & Wolfe, 1999) such that extraverts are more protected against stress than individuals who are more introverted (Lau et al., 2006; Tyssen et al., 2007). These researchers further postulate that these effects protect extraverts from negative, stress-related work outcomes such as burnout (Bakker et al., 2006; Ghorpade et al., 2007; Tokar et al., 1998). However, other researchers note that the relationship between Extraversion and Composure may be more complex and nuanced than some suggest. Specifically, Vollrath and Torgesen (2000) investigated the combined effects of FFM personality dimensions on stress experience and coping. Unlike the effects noted for other scales, Extraversion showed no strong favorable effect against stress. Instead, the effects of Extraversion were more ambiguous, and appeared to depend on the specific combinations of other FFM dimensions. Considering this research, Grant and Langan-Fox (2007) examined the role of

personality in the occupational stressor-strain relationship. This more recent research noted a direct, positive effect for Extraversion on physical and psychological strain. These findings stand in contrast to previously outlined research theorizing that Extraversion may serve as a buffer against stress. As with the research on Conscientiousness, the literature on Extraversion and Composure indicates a complex relationship depending on other personality facets.

Finally, a handful of researchers examined the impact of Agreeableness (being pleasant and accommodating in social situations) and Openness to Experience (being intellectually curious and preferring variety) on Composure. These efforts do not indicate consistently significant effects for either factor. For example, although some have investigated potential effects of these factors on stress-related burnout (Bakker et al., 2006; Ghorpade et al, 2007; Kim et al., 2007), these efforts indicate that other FFM scales exert more influence than do Agreeableness and Openness to Experience. More specifically, research on the direct impact of FFM dimensions on the occupational stressor-strain relationship indicates that Agreeableness and Openness to Experience are unrelated to strain (Grant & Langan-Fox, 2006, 2007).

Practitioners and some researchers use different methods for predicting stress tolerance. For example, some argue that common selection methods such as resume screening and interviews prove ineffective in measuring stress tolerance (Varca, 2006). In addition, although biodata inventories significantly correlate with other outcome variables of interest, these measures do not correlate significantly with resistance to stress (Chait, Carraher, & Buckley, 2000). Researchers devised several alternative scales to measure stress tolerance, including the Employee Attitude Inventory Job Burnout Scale, PEOPLE Survey Wellness Scale, and the PEAK Procedures Stress Scale (Ones, & Viswesvaran, 2001). However, considering the limitations of alternative measurement techniques, personality assessment appears one of the most effective alternatives for predicting and assessing Composure.

Based on the knowledge that professionals could use personality assessment to predict stress tolerance, R. Hogan & Hogan (1995) outlined the use of specific facets of the Adjustment (FFM Emotional Stability) and, to a lesser extent, Ambition (FFM Extraversion) scales from the Hogan Personality Inventory (HPI; R. Hogan & Hogan, 1995, 2007) to construct the HPI's Stress Tolerance occupational scale. The authors designed this scale to identify individuals capable of coping with pressure effectively. Others describe individuals scoring at the high end of this scale as able to handle stress and pressure without

becoming upset, moody, or anxious. Such individuals have a reputation for being quiet, reserved, relaxed, and emotionally stable. In contrast, others describe individuals scoring at the low end of this scale as tense, temperamental, or easily distracted in stressful situations. McDonald, Beckett, and Hogdon (1988) later correlated Stress Tolerance scale scores with those from the Profile of Mood States (POMS; McNair, Lorr, & Droppleman, 1971) and the Tennessee Self Concept Scale (TSCS; Fitts, 1965) for active duty personnel in the U.S. Navy. All results supported the construct validity of the Stress Tolerance scale. Most importantly, J. Hogan, Hogan, & Briggs (1984) found that the Stress Tolerance scale correlated with subsequent measures of job performance, including number of work days missed for medical reasons and number of commendation letters received.

Just as personality dimensions predict composure under stress, behaviors related to Composure predict a number of important performance-related work outcomes. For example, Perkins and Corr (2006) found that stress-intolerant profiles predicted substandard performance in military samples. Similarly, Grant and Langan-Fox (2006) found stress tolerance to predict stress exposure, physical ill health symptoms, and job dissatisfaction. Specifically, in this sample, stress tolerant participants showed lower stress exposure, fewer ill health symptoms, lower job dissatisfaction, and more functional coping mechanisms than did stress intolerant participants. Penley and Tomaka (2002) corroborated these results, finding that stress tolerant participants use more task-focused coping mechanisms than do stress intolerant participants. Finally, research (Bakker et al., 2006; Ghorpade et al., 2007; Kim et al., 2007) indicates that stress tolerant employees exhibit fewer behaviors associated with emotional burnout than do stress intolerant employees.

Beyond these outcomes, previous meta-analyses demonstrate that self-report stress tolerance scales produce operational validities as high as .41 with job performance measures, and .42 with measures of CWBs (Ones & Viswesvaran, 2001a). Also, research demonstrates that measures of stress tolerance have incremental validity above other common selection instruments such as cognitive ability measures (Ones & Viswesvaran, 2001). Although the samples for some of these meta-analyses were limited, these data show that well validated measures of stress tolerance can be useful in selection settings.

In summary, research demonstrates that measures relating to Composure are predictive of multiple work outcomes. Hogan's client research shows that SMEs completing the JET for entry-level jobs rate Composure as "critical for performance" 52% of the time and either "important" or "critical" 90% of the

time. These results, along with our review of previous research, support including Composure in our entry-level competency model.

3.5 Customer Focus We define Customer Focus as a person's capacity to relate to clients or customers, who may be either internal or external to an organization, in a friendly, positive, and helpful manner. Persons with high scores on Customer Focus will listen effectively to customers' questions and concerns, and are polite, patient, attentive, and helpful. Persons with low scores on Customer Focus are more likely to be irritable, impatient, or even rude when responding to customers' concerns, often making it difficult to resolve problems effectively.

J. Hogan, Hogan, and Busch (1984) first defined and published research using the HPI Service Orientation occupational scale. As outlined by the authors, others describe individuals who score high on the scale as helpful, thoughtful, considerate, dependable, well adjusted, and cooperative. Along these lines, prior research on altruistic personality (Carlo, Eisenberg, Troyer, & Switzer, 1991) and prosocial organizational behavior (Brief & Motowidlo, 1986; Organ, 1988) indicates that patterns of stable personality characteristics may lead to service-oriented behavior (Sanchez, Fraser, Fernandez, & De La Torre, 1993). In other words, Customer Focus does not represent a single dimension of personality, but rather a syndrome or pattern of inter-related personality characteristics associated with successful performance in jobs requiring customer service. Job applicants with assessment results that match these patterns are likely to engage in positive, service-oriented behaviors at work (Bowen, Siehl, & Schneider, 1989). Furthermore, by selecting applicants who are predisposed to service behaviors, organizations can increase the effectiveness of their customer service programs (Sanchez et al., 1993).

Several researchers (e.g., R. Hogan & Hogan, 2007; Paajanen, 1991; Saxe & Weitz, 1982) have used market research and job analysis to define determinants of Customer Focus. For example, in the development of the ServiceFirst Inventory, Fogli and Whitney (1991) found effective customer relations were characterized as being active, polite, helpful, and personalized. Parasuraman, Zeithaml, and Berry (1985) conducted focus groups with customers of organizations in several sectors, including banking, credit, securities brokerage, and product repair and maintenance. These consumer focus groups identified ten key determinants of service quality: (a) reliability, involving consistency of performance and dependability; (b) responsiveness, concerning the willingness to provide timely service; (c) competence, or the possession of required skills and knowledge to perform services; (d) access, involving approachability and ease of contact; (e) courtesy, or being polite, respectful, considerate, and friendly; (f)

communication, involving listening to customers and keeping them informed in an understandable manner; (g) credibility, or being trustworthy, believable, honest, and having the customer's best interests at heart; (h) security, or the freedom from danger, risk, or doubt; (i) understanding/knowing the customer, involving making an effort to understand the customer's needs; and (j) tangibles, including physical facilities and tools and equipment. From this list, one can see the roles that various personality dimensions play in effective Customer Focus.

Common themes emerging from these diverse research efforts include being reliable, responsive, friendly, and courteous. A number of researchers also identified relationships between FFM personality scales and Customer Focus. Specifically, research indicates that four of the FFM scales predict service orientation: Conscientiousness, Agreeableness, Emotional Stability, and Extraversion.

Multiple studies find positive correlations between measures of Conscientiousness (being rule-compliant, careful, and thoughtful) and Customer Focus (Frei & McDaniel, 1998; Furnham & Coveney, 1996; Ones & Viswesvaran, 1996, 2001). In fact, in their multi-level study of employees, managers, and customers of 25 different restaurants, Liao and Chuang (2004) found Conscientiousness as one of only two individual variables that explained service orientation differences between employees within the same store. These results stand out in particular because highly conscientious employees enhanced perceptions of service performance for both internal (i.e., managers) and external (i.e., customers) audiences. In addition, situational influences were constant because this was a within-store investigation.

Several researchers report a positive correlation between Agreeableness (being pleasant and accommodating in social situations) and Customer Focus (Frei & McDaniel, 1998; Ones & Viswesvaran, 1996). In fact, Ones and Viswesvaran (2001) found that, among FFM dimensions, Agreeableness had the highest true validity (.70) with customer service scales. Examining the effects of personality on customer service behavior among frontline sales personnel in fast-food convenience stores, Hurley (1998) found Agreeableness as one key personality dimension underlying trait descriptors provided by customers, managers, and salespeople to describe superior customer service providers. Brown, Mowen, Donavan, and Licata (2002) identified Agreeableness as one of three personality dimensions accounting for 39% of variance in employee customer orientation. Finally, recent research by Motowidlo, Brownlee, and Schmit (2008) concluded that Agreeableness predicted service orientation, even after accounting for the effects of Conscientiousness and other factors (i.e., ability, experience).

Emotional Stability (being calm, even-tempered, and resilient to stressful situations) is also related to successful performance in customer service contexts (Frei & McDaniel, 1998; Furnham & Coveney, 1996; Ones & Viswesvaran, 1996, 2001). Considering Hurley's (1998) research on the effects of personality on customer service among convenience store sales personnel, Emotional Stability represented another key personality dimension underlying customer, manager, and salesperson trait descriptors for superior customer service providers. Additionally, Brown, Mowen, Donavan, and Licata (2002) identified Emotional Stability as the second of three personality dimensions accounting for 39% of variance in employee customer orientation.

Although the evidence linking Extraversion (being outgoing, talkative, and assertive) to Customer Focus is mixed, a number of researchers report that the two are related (i.e., Furnham & Coveney, 1996; Hurley, 1998). Specifically, in their multi-level research of restaurant employees, managers, and customers, Liao & Chuang (2004) identified Extraversion as the second individual difference variable explaining service orientation differences between employees from the same restaurant. Consistent with their findings on Conscientiousness, it appears that both managers and customers favorably rate the service performance of highly gregarious and outgoing employees. These findings suggest a positive relationship between Extraversion and Customer Focus.

However, the relationship between Extraversion and Customer Focus also may be curvilinear. In other words, the most highly extraverted employees may focus more on the social aspects of their job than the task-related job requirements. Stewart and Carson (1995) confirmed this hypothesis, finding a negative relation between Extraversion and customer service. The authors speculate that highly outgoing and sociable employees give insufficient attention to completing customer interactions effectively. As such, it appears from the available research evidence that being reasonably (but not extremely) gregarious and outgoing (FFM Extraversion), careful and thoughtful (FFM Conscientiousness), pleasant and socially accommodating (FFM Agreeableness), and even-tempered and calm under stress (FFM Emotional Stability) predicts Customer Focus. This is the concept that Kaplan and Kaiser (2006, 2009) report as "under doing" and "over doing."

Other than using personality to predict Customer Focus, a great deal of research focuses on improving Customer Focus among existing employees. Although researchers investigated several alternatives to personality for measuring and predicting customer service among both job applicants and incumbents, these efforts enjoy minimal success. For example, although biodata inventories can

predict customer service, these scales correlate highly with personality-based customer service measures and do not provide an advantage in validity (Chait et al., 2000). Other methods include interviews and assessment centers, although research indicates that both of these methods suffer from problems surrounding construct validity (van Iddekinge, Raymark, Eidson, & Attenweller, 2004). Considering these limitations, it appears that personality assessment remains the most promising avenue for predicting and otherwise assessing Customer Focus.

Building on this research, Hogan and colleagues (J. Hogan & Hogan, 1986; J. Hogan, Hogan, & Busch, 1984) used specific facets of Adjustment (FFM Emotional Stability), Interpersonal Sensitivity (FFM Agreeableness), Prudence (FFM Conscientiousness), and Sociability (FFM Extraversion) scales from the HPI to construct the Service Orientation Index (SOI). The SOI identifies individuals who provide courteous, timely, and helpful service to both internal and external customers. Specifically, others see individuals who score high on this scale as energetic, sociable, and efficient. In contrast, others view individuals who score low on the scale as lazy, withdrawn, and bashful. The SOI also showed no evidence of discrimination against racial/ethnic groups, and evidenced a sensible pattern of correlations with other well-known personality and vocational preference measures. Most importantly, the SOI showed predictive validity of on-the-job performance, not in terms of technical competence, but rather in terms of maintaining good relations with customers and other members of the organization.

Just as various personality scales relate to Customer Focus, behaviors associated with Customer Focus predict a variety of important objective and subjective work outcomes. Using terms valued by most client organizations, Bowen et al. (1989) recount performance outcomes of prior customer service research. As they describe, Porter (1980) illustrated how providing responsive customer service can increase the value-added component the organization provides the buyer. Buzzell and Gale (1987) add that customer service represents an important determinant of the customer's perception of product quality, which relative to the competition, remains the most significant factor affecting long-term performance. Moreover, as it contributes to overall perceptions of quality, customer service can contribute substantially to market share and return on investment (Anderson & Zeithaml, 1984; Parasuraman et al., 1985; Phillips, Chang, & Buzzell, 1983).

Beyond its positive impact on consumer perceptions and organizational outcomes, Customer Focus predicts a number of individual outcomes as well. Specifically, meta-analysis shows that customer service scales produce

operational validities as high as .39 with job performance measures (Ones & Viswesvaran, 2001a; Ones, Viswesvaran, & Dilchert, 2005). In fact, these validities may reach as high as .50 once corrected for criterion unreliability and range restriction (Frei & McDaniel, 1998). Customer service orientation also predicts such diverse performance criteria as communication skills, relational skills, working well with customers under pressure, interview ratings, aptitude test scores, and overall performance ratings (Brown et al., 2002; DeGroot & Kleumper, 2007; Donavan, Brown, & Mowen, 2004; Frei & McDaniel, 1998; Furnham & Miller, 2008; J. Hogan, Hogan, & Busch, 1984; Liao & Chuang, 2004). Furthermore, customer service orientation predicts negative performance criteria, with meta-analytic operational validities as high as .42 with measures of CWBs (Ones & Viswesvaran, 2001a).

In summary, research demonstrates that measures relating to Customer Focus are predictive of multiple work outcomes across jobs and industries. Hogan's client research shows that SMEs completing the JET for entry-level jobs rate Customer Focus as "critical for performance" 64% of the time and either "important" or "critical" 86% of the time. These results, along with our review of previous research, support including Customer Focus in our entry-level competency model.

4 – DEVELOPMENT OF THE HOGAN ADVANTAGE

4.1 Competency Algorithms As previously discussed, narrow personality facets enjoy a predictive and explanatory advantage over broad factors because facets account for narrow segments of criterion variance unaccounted for by the broader factors (J. Hogan & Roberts, 1996; Paunonen & Ashton, 2001; Paunonen & Nicol, 2001). Combinations of narrow personality variables also exhibit incremental validity beyond prediction based on broader personality factors (Paunonen, 1998; Paunonen et al., 2003). Because combinations of narrow personality variables are more predictive of many work-related outcomes (e.g., competencies) than are single personality scales (Ones, Dilchert, Viswesvaran, & Judge, 2007; Tett & Christiansen, 2007), one would expect that combining facet-level results across personality scales would improve the prediction of specific competencies. Consistent with this idea, Hogan developed mathematical scoring algorithms to combine results across multiple personality facets to maximize the prediction of specific job performance competencies.

Realizing the need for such models, Hough (2001) recommended such an approach to maximize the prediction of important organizational outcomes using narrow personality facets across FFM dimensions. Specifically, she stated:

> *What is needed is a database that can be used with synthetic validation models to build prediction equations for specific situations. First, however, I/O psychologists need research data to provide information about the relationships between predictor constructs and the criterion constructs…* (p. 37)

Applying these recommendations, we describe the research examining the use of personality variables to predict Dependability, Composure, and Customer Focus. Because research demonstrates that various personality facets can predict these important work-related outcomes, we can develop scoring algorithms to provide maximum prediction of these competencies using predictive personality facets from across HPI scales (J. Hogan & Roberts, 1996). As Hough (2001) notes, such efforts require a database from which to draw data for building predictive equations. The Hogan archive, including data from nearly 600 applied research efforts conducted over the last 30 years, provides an adequate source of data for this purpose.

The development of competency-based scoring algorithms requires three steps. First, clear competency definitions must exist. To predict performance for a specific competency, researchers must first know what it is they are trying to

forecast. We addressed this step by researching each competency. The second step entails identifying facets of personality measures that predict competency criterion ratings. We completed this step by identifying individual HICs relating to each competency from the HPI. The third and final step involves examining alternative scoring algorithms to assess empirical validity across multiple datasets. The methods for combining personality facets, such as using the weight or importance given to specific HICs over others, can affect the predictive validity of a scoring algorithm. For this reason, we tested multiple algorithms for each competency to maximize predictive validity.

4.2 Research Approach and Rationale To develop algorithms, we balanced research- and data-driven approaches, aggregating theoretical and empirical findings for each competency. Specifically, we identified HICs with both theoretical and empirical relationships with each competency. In addition, to avoid redundancies and overlap across scoring algorithms, we used each HIC only once.

Using these linkages, Hogan developed final algorithms for predicting each competency. First, we identified studies in the Hogan archive containing criterion data relating to each competency. Next, we identified HICs associated with each of these facets. Finally, we developed and examined the empirical predictive validity of algorithms used to combine HICs to predict supervisor ratings of each competency. The next section of this report outlines this process in detail.

4.3 Algorithm Development The first step to develop the Hogan Advantage involved creating scoring algorithms to predict each component of the entry-level competency model. Development of predictive algorithms requires a balanced, parallel approach of qualitative, expert judgment-driven methods and quantitative, data-driven methods. The theoretical approach relies on expert, theory-driven judgment to identify personality constructs that predict competency-based performance. The empirical approach relies on studies that include both predictor and job performance data in the Hogan archive for each competency under study.

Using theoretical, expert judgment-driven methods to develop predictive algorithms, Hogan followed a three-step process. First, we relied on the competency components to determine personality constructs likely to predict performance. Second, we identified potentially predictive HPI scales and candidate HICs. Finally, we identified specific HICs hypothesized to predict

competencies. An expert panel with over 60 years of combined experience using the HPI to forecast job performance completed these steps.

For empirical development, the Hogan archive served as the warehouse for developing data-driven algorithms to predict job performance. To derive these formulae, Hogan followed a three-step process. First, we identified all studies in the Hogan archive containing both HPI and performance data relating to each competency in the model. Second, we correlated HIC scores and performance measures. Finally, we developed scoring algorithms composed of HICs that showed significant relationships with supervisory performance ratings for each competency across studies.

To develop algorithms, Hogan aggregated results to identify core HICs – those with both theoretical and empirical links – for each component of the model. Table 4.1 presents the HICs associated with each competency.

As seen in the table, each competency is associated with four HICs. No HICs are included in predictive algorithms for more than one competency, and other HICs are not used at all. These parallel strategies represent two significant characteristics of the development process, ensuring that only the most predictive facets of personality contribute to final competency scores and that minimal item overlap exists between competencies.

Table 4.1 HPI HICs Selected for Entry-Level Competencies

HPI Scale	HIC	Competency		
		Dependability	**Composure**	**Customer Focus**
Adjustment	Empathy		X	
	Not Anxious		X	
	No Guilt			
	Calmness		X	
	Even Tempered		X	
	No Complaints			
	Trusting			X
	Good Attachment			
Ambition	Competitive			
	Self Confidence			X
	Accomplishment			
	Leadership			
	Identity			
	No Social Anxiety			
Sociability	Likes Parties			
	Likes Crowds			
	Experience Seeking	X		
	Exhibitionistic			
	Entertaining			
Interpersonal Sensitivity	Easy to Live With			
	Sensitive			
	Caring			
	Likes People			X
	No Hostility			
Prudence	Moralistic			
	Mastery			
	Virtuous			X
	Not Autonomous			
	Not Spontaneous			
	Impulse Control	X		
	Avoids Trouble	X		

Table 4.1 HPI HICs Selected for Entry-Level Competencies (Continued)

HPI Scale	HIC	Competency		
		Dependability	**Composure**	**Customer Focus**
Inquisitive	Science Ability			
	Curiosity	X		
	Thrill Seeking			
	Intellectual Games			
	Generates Ideas			
	Culture			
Learning Approach	Education			
	Math Ability			
	Good Memory			
	Reading			

4.4 Method Hogan used meta-analysis to examine expected validities for the selected competencies. Meta-analysis averages findings from multiple studies examining relationships between similar variables. The procedure controls for error due to sampling, measurement, range restriction, and potential moderating variables and provides a best estimate of these relationships across jobs and organizations (Smith & Glass, 1977). Moderators represent other job or organizational characteristics that affect the relations under examination.

We used procedures outlined by Hunter and Schmidt (2004), who argue that differences in a test's validity across studies reflect statistical artifacts (e.g., sampling deficiency) and measurement problems (e.g., predictor/criterion unreliability, range restriction) rather than other characteristics unique to specific jobs or situations. These meta-analytic procedures demonstrate that correlations between performance measures and cognitive ability tests (Schmidt & Hunter, 1977), biographical data inventories (Schmidt & Rothstein, 1994), personality inventories (Barrick & Mount, 1991; Barrick, Mount, & Gupta, 2003; J. Hogan & Holland, 2003; Hough, 1992; Judge, Bono, Ilies, & Gerhardt, 2002; Salgado, 1997, 1998; Tett, Jackson, & Rothstein, 1991), assessment center exercises (Arthur, Day, McNelly, & Edens, 2003; Gaugler, Rosenthal, Thornton, & Benson, 1987), and situational judgment tests (McDaniel, Morgeson, Finnegan, Campion, & Braverman, 2001) generalize across jobs and organizations.

According to the *Principles*, "reliance on meta-analysis results is more straightforward when they are organized around a construct or set of constructs"

(SIOP, 2003). Schmidt and Hunter (1977) used a construct orientation in their well-known meta-analysis of cognitive ability measures. J. Hogan and Holland (2003) did the same using a domain skills model as the basis for a meta-analysis of personality predictor correlations. They showed that personality predicts job performance more strongly than previously reported from studies examining personality and overall job performance. Such a construct driven approach, aligning facets of personality with work-related outcomes, has two advantages. First, theory drives professional judgment, which is unavoidable when compiling data from multiple studies. Second, a theory-driven approach provides a framework for interpreting results.

4.4.1 Case Selection Hogan used a criterion-centric approach (Bartram, 2005; Campbell, 1990; J. Hogan & Holland, 2003, Hough, 1992; Hurtz & Donovan, 2000) to develop competency-based scoring algorithms for each component of the model. Case selection for each competency began with a search of the Hogan archive to identify studies with criterion measures of each competency. To be included for consideration, studies had to (a) include job analysis information, (b) contain HPI HIC data, (c) use a concurrent or predictive validation strategy, and (d) contain criterion data explicit to one of the competencies. In addition, studies were excluded if they (a) were not conducted with the assistance of Hogan researchers. (b) contained only self-report criterion data, or (c) were unrelated to work contexts (e.g., student performance).

4.4.2 Job Analysis Studies included in our sample used some type of job analysis as part of the criterion-related validation methodology. Most studies used the JET. Hogan designed the JET to identify critical personal requirements and competencies required for effective performance. A copy of the CET section of the JET appears in Appendix A. Other forms of job analysis included detailed task analysis, job observation, focus groups, and interviews with SMEs.

4.4.3 Meta-Analysis Procedures Hogan used zero-order product-moment correlations (r) as effect sizes for all studies included in the meta-analyses. Moreover, as recommended by Hunter and Schmidt (2004), we used a random-effects model, allowing the population parameter to vary from study to study. As a result, this model provides for the possibility that relationships between variables may vary across jobs and organizations. This feature is in contrast to a fixed-effects model, which assumes the relationship between variables is consistent across all possible studies.

The use of a random effects model allows researchers to present both confidence intervals and credibility intervals with meta-analytic results. On the one hand,

confidence intervals estimate the statistical significance of the relationship between variables across all jobs and organizations. If the lower end of a 95% confidence interval does not include zero, there is less than a 5% chance that the results of the meta-analysis are simply due to chance. On the other hand, credibility intervals estimate the variability of results across studies. If the lower end of a 80% credibility interval does not include zero, more than 90% of the results across studies will be in the expected direction (i.e., will have positive correlations). In other words, confidence intervals estimate the *accuracy* of the relationship between variables across jobs and organizations, and credibility intervals estimate the *variability* in results across specific studies.

Although some researchers (e.g., Murphy & DeShon, 2000) argue against the use of rater-based reliability estimates, we followed procedures outlined by Barrick and Mount (1991) and Tett et al. (1991), using the .508 reliability coefficient proposed by Rothstein (1990) as the estimate of the reliability of supervisory ratings of job performance. Job performance measures lack perfect reliability, meaning that supervisory ratings may vary due to factors such as the characteristics of the supervisor and the time during which measures are collected. This lack of reliability attenuates correlations between predictors and measures of job performance. The correction for unreliability used in this study estimates the true relationship between scores produced from the competency-based scoring algorithms and individual job performance on these competencies.

Hunter and Schmidt (2004) point out that meta-analytic results can be biased unless each sample contributes approximately the same number of correlations to the analysis. To eliminate such bias, we used only one criterion measure per study to represent each competency. Note that this procedure uses both negative and positive correlations rather than mean absolute values for averaging correlations. This is the major computational difference between the current analyses and those presented by Tett et al. (1991, p. 712). We did not correct correlation coefficients to estimate validity at the construct level. Although some (e.g., Mount & Barrick, 1995; Ones, Viswesvaran, & Schmidt, 1993) argue this is an artifact that can be corrected, we believe it is premature to estimate the validity of perfect constructs when there is no agreement regarding what they are. That is, scales on different personality measures that purportedly assess the same construct are nuanced and extend the boundaries of those constructs in directions beyond the central theme (Barrett & Rolland, 2009).

4.5 Competency Results Table 4.2 presents the relationships between scores for each competency-based scoring algorithm and respective measures of rated job performance found across multiple studies in the Hogan archive. As seen in the

table, we identified at least 12 studies containing criterion data for each competency. These studies included between 1,282 and 2,855 participants to assess the validity of the scoring algorithms for prediction of the competencies.

Table 4.2 Validity Results for Competency Algorithms

Scale	k	N	r_{obs}	SD_r	ρ	SD_ρ	%VE	80% CV	95% CI
Dependability	12	1,282	.20	.09	.28	.13	99	.20	.15
Composure	17	2,855	.19	.08	.27	.11	93	.18	.16
Customer Focus	12	1,357	.26	.13	.36	.19	44	.14	.18

Note. Results corrected for criterion unreliability. k = Number of correlations; N = Sample size; r_{obs} = Observed mean correlation; SD_r = Sample-weighted standard deviation; ρ = Sample weighted correlation corrected for unreliability in the criteria; SD_ρ = Standard deviation of the corrected population correlation; %VE = Percent of variance accounted for by sampling error and artifact corrections' 90% CV = lower 10% boundary of 80% Credibility Interval; 95% CI = lower 2.5% boundary of 95% Confidence Interval.

Table 4.2 shows that the lower bounds for credibility intervals and confidence intervals do not include zero for any competency. Because over 90% of all samples produce positive results for each algorithm, and each algorithm produces scores significantly related to components of the entry-level competency model, these results support implementing the competency-based scoring algorithms in the Hogan Advantage.

4.6 Scoring For each competency included in the model, we computed final scale scores by converting results from each algorithm to a 0-100 scale. Table 4.3 presents means and standard deviations for each scale from the Hogan Advantage normative sample outlined in Chapter 8.

Table 4.3 Scale Means and Standard Deviations

Scale	*M*	*SD*
Dependability	41.76	14.53
Composure	80.98	15.91
Customer Focus	80.05	12.84

Note. N = 5,785. *M* = Mean; *SD* = Standard Deviation.

As seen in Table 4.3, means and standard deviations varied across scales, indicating that score distributions also varied. For this reason, we used normative results to convert scores on each dimension of the competency model to a common metric. We compute scores on the Hogan Advantage using "Low,"

"Below Average," "Average," "Above Average," and "High" score ranges for each competency.

In addition to the three primary scales, the inventory contains a validity key. This 14-item scale is designed to detect careless or random responding. The scale was constructed rationally using items endorsed consistently "yes" or "no" by respondents. Therefore, an incorrect response to one of these items is an infrequent occurrence. In fact, over half (55%) of the Hogan Advantage normative dataset (N = 5,785) described in Chapter 8 obtained a perfect score on this scale.

4.7 Correlations Between Scales To examine relationships between each of the three entry-level scales, we computed correlations using data in the Hogan Advantage normative sample (N = 5,785). We examined test-retest reliability using a sample of 412 respondents in client organizations who completed the HPI on multiple occasions. This sample included data from 221 males and 117 females (74 respondents did not indicate their gender). Respondent ages ranged from 18 to 62 with a mean of 28.09 years (*SD* = 18.14). Duration between the first and second administrations of the HPI ranged from 0 to 64 months with a mean of 11.30 (SD = 9.98). We did not examine internal consistently reliability using coefficient alphas. The primary scales on the HPI were constructed using factor analysis, which optimizes internal consistency. Because we combined HICs from multiple HPI primary scales to form the heterogeneous Hogan Advantage scales, the statistical independence of these HICs reduces internal consistency. Therefore, test-retest reliability is not only more appropriate, but more accurately reflects the practical application of the Hogan Advantage. Table 4.4 presents correlations between scales in columns and rows and test-retest reliability data in the diagonal.

Table 4.4 Correlations between Hogan Advantage Competencies

	Dependability	**Composure**	**Customer Focus**
Dependability	*.64*		
Composure	.16	*.63*	
Customer Focus	.11	.48	*.68*

Note. All correlations are significant at the .001 level. Diagonal results (those in italics) represent test-retest reliability results.

As seen in Table 4.4, correlations between components of the model ranged from .11 to .48. Although moderate, relationships between competencies varied widely. We attempted to use HICs for each competency to devise broad

composite predictors. Results in Table 4.4 suggest that our attempts were largely successful and that the competencies comprising the Hogan Advantage do not significantly relate. The .48 correlation between Composure and Customer Focus represents the exception to this rule. However, this association makes intuitive sense, as successful customer service employees will require a basic level of composure when dealing with difficult and/or dissatisfied customers.

4.8 Description of the Hogan Advantage

- 74 true/false items with no psychiatric content
- Comprised of existing HICs from the Hogan Personality Inventory (HPI)
- Contains 3 personality-based competency scales and 1 validity scale with no item overlap
- Written at a 4th grade reading level
- Available in over 25 different languages
- 5-10 minute completion time
- Designed for ages 18 and above
- Designed for use in personnel selection and development applications
- Internet-based administration and reporting

Scores from the Hogan Advantage populate a simple, two-page candidate report useful for helping personnel managers decide whether a candidate should move forward in a selection process. This report includes definitions of the Hogan Advantage scales, candidate scores on each scale, suggested interview questions to follow-up with candidates on scores for each scale, and an overall candidate employability score. A sample Hogan Advantage report appears in Appendix B of this manual.

5 - VALIDITY

5.1 Construct Validity This chapter addresses a fundamental question concerning what scores on the Hogan Advantage scales mean. This is the issue of validity, a much discussed but often misunderstood topic. In our view, the "job" of assessment is to predict significant outcomes. The more significant outcomes predicted, the more useful the assessment. For example, Gough's (1975) goal for the California Psychological Inventory, one of the most extensively validated assessments of personality in the history of measurement, is to predict important social outcomes. Similarly, we designed the Hogan Advantage scales to predict outcomes, not to measure traits. In general, personality measures have succeeded in accomplishing this goal (Roberts, Kuncel, Shiner, Caspi, & Goldberg, 2007)

As presented elsewhere in this document, we have a theory about the content of each scale. Specifically, we designed each scale to assess a particular characteristic needed for success in entry-level jobs. Thus, the validity of the Hogan Advantage scales depends not only on having robust external correlates, but also on having external correlates that make sense given our theory of each scale's content (cf. R. Hogan, Hogan, & Roberts, 1996).

5.2 Correlations with Other Assessments In the sections that follow, we define the characteristics each scale intends to capture, and then review the evidence regarding the pattern of external correlates for each scale. Correlational analyses are one source of evidence for construct validity. In this section, we provide correlation matrices for three domains of psychological assessments. We provide relational results between the Hogan Advantage and personality measures, values/needs/motives/interest inventories, and cognitive ability tests. In many cases, respondents completed the HPI and other instruments for which we examine correlations. In such cases, we derived scores for the Hogan Advantage scales for these samples, and used these scores to compute correlations. Results from 12 matrices are presented in this section; additional matrices are available that are contained as part of Goldberg's (2008) Eugene-Springfield Community Sample.

5.2.1 Procedure We collected HPI data using online internet testing in both proctored and unproctored conditions, and calculated Hogan Advantage scale scores based on those data. The data presented in this chapter come from multiple studies specifically designed to assess construct validation between Hogan assessments and other instruments. Although Hogan researchers lead many of these efforts, external researchers in both academic and applied settings collected data for other instruments. Specifically, we obtained data for several

comparisons through the longitudinal Eugene-Springfield Community Sample coordinated by Dr. Lewis Goldberg. Dr. Goldberg recruited approximately 1,000 individuals to participate in the project. However, because Dr. Goldberg collected data on 30 different assessments, only a portion of this sample completed each instrument.

5.2.2 Samples and Instruments

HPI. First, we review Hogan Advantage correlations with the Hogan Personality Inventory (HPI; R. Hogan & Hogan, 1995, 2007). As outlined in Chapter 2, we developed the Hogan Advantage using facets scales (HICs) from the HPI. As such, correlations between Hogan Advantage and HPI scales reflect overlap between the two assessments and primarily serve as an indicator of where this overlap exists.

We administered both measures to 28,564 applicants and incumbents employed in non-managerial jobs within private sector organizations in the U.S. (see Table 5.1). The sample included 14,566 males and 11,340 females (2,658 individuals did not indicate gender). Ages of subjects ranged from 17 years to 91 years with a mean of 36.13 years (*SD* = 9.84).

The HPI is a 206-item true-false measure of normal personality, whose measurement foundation is in the Five-Factor Model (De Raad & Perugini, 2002; Wiggins, 1996) and whose conceptual foundation is socioanalytic theory (R. Hogan, 1983, 1991, 1996). The HPI is normed on 156,614 working adults with norming samples representing a stratification of the U.S. workforce (R. Hogan & Hogan, 2007). The HPI contains seven primary scales and a validity scale. In addition, a number of occupational scales are available for specialized applications. The seven primary scales are Adjustment (ADJ), Ambition (AMB), Sociability (SOC), Interpersonal Sensitivity (INP), Prudence (PRU), Inquisitive (INQ), and Learning Approach (LRN). The validity key (VAL) contains 14 items designed to detect careless or random responding. R. Hogan and Hogan (2007) present the technical features of the HPI including reliability, confirmatory factor analysis, and validity. Professional reviews are available in the Mental Measurements Yearbook (Lobello, 1998) and in the British Psychological Society's psychological centre's test reviews (British Psychological Society, 2007).

J. Hogan and Holland (2003, p. 104) demonstrate that the HPI is an adequate measure of the FFM. Median correlations with other FFM inventories range from .30 to .69. The HPI is a well-established measure that predicts job performance and does not result in adverse impact. Further, faking on the HPI

(or other personality measures used for personnel decisions) is not a significant problem (J. Hogan, Barrett, & Hogan, 2007).

HDS. Second, we review Hogan Advantage correlations with the Hogan Development Survey (HDS; R. Hogan & Hogan, 2009) (see Table 5.2). We administered both measures to 757 managers and professionals employed in private sector organizations in the U.S. All participants were pursing corporate programs of professional development where the assessments were a component of the program. The sample included 488 males and 247 females (22 individuals did not indicate gender). Ages of subjects ranged from 19 years to 65 years with a mean of 38.27 years (*SD* = 9.97). All had completed a high school education and most had post-graduate training.

The HDS is a 168-item true-false measure of personality characteristics that can derail careers, relationships, and productive life activities. The HDS is normed on 109,103 working adults with norming samples representing a stratification of the U.S. workforce (R. Hogan & Hogan, 2009). The HDS contains 11 scales. These scales are Excitable (EXC), Skeptical (SKE), Cautious (CAU), Reserved (RES), Leisurely (LEI), Bold (BOL), Mischievous (MIS), Colorful (COL), Imaginative (IMA), Diligent (DIL), and Dutiful (DUT). R. Hogan and Hogan (2009) present the technical features of the HDS, including reliability, factor analysis, and validity.

CPI. Third, we review Hogan Advantage correlations with the California Psychological Inventory (CPI; Gough, 1996) (see Table 5.3). We obtained data for these correlations through the Eugene-Springfield Community study. Data were limited to participants who completed both the HPI and the CPI, resulting in a sample of 160 individuals. The sample included 68 males and 92 females. Ages of subjects ranged from 29 years to 79 years with a mean of 49.39 years (*SD* = 9.51).

The CPI is a 434-item true-false measure of personality and behavior. The CPI is normed on 52 male and 42 female samples. These norming samples include a high school sample, college sample, graduate and professional school sample, and occupational samples. The CPI contains twenty folk and three vector scales. The twenty folk scales are Dominance (Do), Capacity for Status (Cs), Sociability (Sy), Social Presence (Sp), Self-acceptance (Sa), Independence (In), Empathy (Em), Responsibility (Re), Socialization (So), Self-control (Sc), Good Impression (GI), Communality (Cm), Well-being (Wb), Tolerance (To), Achievement via Conformance (Ac), Achievement via Independence (Ai), Intellectual Efficiency (Ie), Psychological-mindedness (Py), Flexibility (Fx), and Femininity/Masculinity (F/M). The three vector scales are Externality/Internality (v.1), Norm-

doubting/Norm-favoring (v.2), and Ego-integration (v.3). Gough (1996) presents the technical features of the CPI, including reliability, factor analysis, and validity.

NEO PI-R. Fourth, we review Hogan Advantage correlations with the NEO PI-R (Costa & McCrae, 1992) (see Table 5.4). We obtained data for these correlations through the Eugene-Springfield Community study. Data were limited to participants who completed the HPI and the NEO PI-R, resulting in a sample of 152 individuals. The sample included 67 males and 85 females. Ages of subjects ranged from 29 years to 72 years with a mean of 49.34 years (*SD* = 9.40).

The NEO PI-R is a 240-item true-false measure of personality. Specifically, it measures five major dimensions of personality, as well as important facets of each domain with applicability in both clinical and research domains. The NEO PI-R is normed on 1,000 adults with norming samples representing a stratification of the U.S. population based on race and age (Costa & McCrae, 1992). The NEO PI-R contains five domain scales and thirty facet scales. The five domains are Neuroticism (N), Extraversion (E), Openness (O), Agreeableness (A), and Conscientiousness (C). There are six facet scales that fall within each domain. The Neuroticism facets are Anxiety (N1), Angry Hostility (N2), Depression (N3), Self-Consciousness (N4), Impulsiveness (N5), and Vulnerability (N6). The Extraversion facets are Warmth (E1), Gregariousness (E2), Assertiveness (E3), Activity (E4), Excitement-Seeking (E5), and Positive Emotions (E6). The Openness facets are Fantasy (O1), Aesthetics (O2), Feelings (O3), Actions (O4), Ideas (O5), and Values (O6). The Agreeableness facets are Trust (A1), Straightforwardness (A2), Altruism (A3), Compliance (A4), Modesty (A5), and Tender-Mindedness (A6). The Conscientiousness facets are Competence (C1), Order (C2), Dutifulness (C3), Achievement Striving (C4), Self-Discipline (C5), and Deliberation (C6). Costa and McCrae (1992) present the technical features of the NEO PI-R, including reliability, factor analysis, and validity.

IPIP. Fifth, we review Hogan Advantage correlations with the International Personality Item Pool (IPIP; Goldberg, Johnson, Eber, Hogan, Ashton, Cloninger, & Gough, 2006) (see Table 5.5). We obtained data for these correlations through the Eugene-Springfield Community study. Data were limited to participants who completed the HPI and the IPIP, resulting in a sample of 131 individuals. The sample included 59 males and 72 females. Ages of subjects ranged from 29 years to 79 years with a mean of 49.77 years (*SD* = 9.82).

The International Personality Item Pool (Goldberg, 1999; Goldberg, et al., 2006) is an online pool of over 2,000 items assessing personality. The purpose of IPIP is to continuously develop and refine personality inventories. IPIP is available for

anyone to contribute items and to use. Currently, assessment users can create 269 scales from the available items. Researchers regularly update the IPIP and corresponding scales to use new and refined items. Norms for the IPIP are not available; the authors argue they would be misleading. However, the authors also inform users of the IPIP that local norms can be created based on one's own sample. For the correlations presented here, we used the following scales: Extraversion (EXT), Agreeableness (AGR), Conscientiousness (CON), Emotional Stability (EMS), and Intellect/Imagination (I/I). Goldberg et al. (2006) and the International Personality Item Pool website (http://ipip.ori.org) present the technical features of the IPIP, including scale construction and validity indices.

16PF. Sixth, we review Hogan Advantage correlations with the Sixteen Personality Factor Questionnaire (16PF; Conn & Rieke, 1994; Russell & Karol, 2002) (see Table 5.6). We obtained data for these correlations through the Eugene-Springfield Community study. The sample was limited to participants who completed the HPI and the 16PF, resulting in a sample of 156 individuals. The sample included 66 males and 90 females. Ages of subjects ranged from 29 years to 79 years with a mean of 49.39 years (*SD* = 9.74).

The 16PF is a 185-item measure of normal personality, whose foundation rests on factor analyzing all English-language adjectives describing human behavior. The 16PF is normed on 10,261 adults with norming samples representing a stratification of the U.S. adult population. The 16PF contains sixteen primary personality factor scales, which are bipolar scales (high and low scores have meaning). In addition to the sixteen primary scales, there are five global factor scales and an Impression Management Index assessing social desirability. The sixteen factor scales are Factor A: Warmth, Factor B: Reasoning, Factor C: Emotional Stability, Factor E: Dominance, Factor F: Liveliness, Factor G: Rule-Consciousness, Factor H: Social Boldness, Factor I: Sensitivity, Factor L: Vigilance, Factor M: Abstraction, Factor N: Privateness, Factor O: Apprehension, Factor Q1: Openness to Change, Factor Q2: Self-Reliance, Factor Q3: Perfectionism, and Factor Q4: Tension. The five global factor scales are Extraversion (EX), Anxiety (AX), Tough-mindedness (TM), Independence (IN), and Self-Control (SC). Conn and Rieke (1994) present the technical features of the 16PF, including reliability, item analysis, factor analysis, and validity.

OPQ. Seventh, we review Hogan Advantage correlations with the Occupational Personality Questionnaire (OPQ; SHL, 2006). Researchers administered both the HPI and the OPQ to 159 entry-level employees identifying themselves as belonging to one of seven different occupations across industry sectors (see Table 5.7). The sample included 53 males and 106 females. Ages of subjects ranged from 20 years to 64 years with a mean of 33.18 years (*SD* = 9.71).

The normative version of the OPQ32 is a 230-item measure of personality (the ipsative version of the OPQ32 contains 416 items) with the goal of describing 32 dimensions or scales of preferred or typical style of behavior at work. The OPQ32 is normed in over 80 regional norm groups describing various occupational groups from undergraduates to senior managers. Sample sizes for these norm groups range from 273 to 17,368. The general population norm contains data from 2,028 individuals from the United Kingdom. The 32 scales of the OPQ32 fall into eight broad categories. These categories and scales are as follows: (a) Influence – Persuasive, Controlling, Outspoken, Independent-Minded; (b) Sociability – Outgoing, Affiliative, Socially Confident; (c) Empathy – Modest, Democratic, Caring; (d) Analysis – Data Rational, Evaluative, Behavioral; (e) Creativity and Change – Conventional, Conceptual, Innovative, Variety Seeking, Adaptable; (f) Structure – Forward Thinking, Detail Conscious, Conscientious, Rule Following; (g) Emotion – Relaxed, Worrying, Tough Minded, Optimistic, Trusting, Emotionally Controlled; (h) Dynamism – Vigorous, Competitive, Achieving, Decisive. The OPQ32 technical manual (SHL, 2006) presents the technical features of the OPQ32, including item content, reliability, factor analysis, and validity.

MVPI. Eighth, we review Hogan Advantage correlations with the Motives, Values, Preferences Inventory (MVPI; J. Hogan & Hogan, 1996). We administered both the HPI and MVPI to 28,535 applicants and incumbents employed in non-managerial jobs within private sector organizations in the U.S. (see Table 5.8). The sample included 14,566 males and 11,340 females (2,658 individuals did not indicate gender). Ages of subjects ranged from 17 years to 91 years with a mean of 36.13 years (*SD* = 9.84).

The MVPI is a 200-item measure of motives, values, and preferences with the goal of evaluating fit between an individual and an organization. A second goal of the MVPI is to assess a person's motives directly. For example, is a person motivated by money, security or fun? The MVPI is normed on 3,015 adults, most of whom are employees or job applicants (J. Hogan & Hogan, 1996). The MVPI contains ten scales: Aesthetic (Aes), Affiliation (Aff), Altruistic (Alt), Commercial (Com), Hedonistic (Hed), Power (Pow), Recognition (Rec), Scientific (Sci), Security (Sec), and Tradition (Tra). Hogan constructed each scale to reflect five themes: Lifestyles, Beliefs, Occupational Preferences, Aversions, and Preferred Associations. J. Hogan and Hogan (1996) present the technical features of the MVPI, including item content, reliability, factor analysis, and validity.

CISS. Ninth, we review Hogan Advantage correlations with the Campbell Interest and Skill Survey (CISS; Campbell, Hyne, & Nilsen, 1992) (see Table 5.9). We obtained data for these correlations through the Eugene-Springfield

Community study. Data were limited to participants who completed the HPI and the CISS, resulting in a sample of 141 individuals. The sample included 62 males and 79 females. Ages of subjects ranged from 29 years to 79 years with a mean of 49.30 years (*SD* = 10.14).

The CISS maps self reported skills and interests to the occupational world, with the purpose of providing individuals with career guidance. It is intended for use with most adults and students as young as 15. This survey contains 200 interest items and 120 skill items measured on a six-point scale. The interest scales provide an indicator for the strength of attraction to occupational areas, while the skills scales are an estimate of competence. Overall, there are seven major Orientation scales, which indicate attraction to and confidence in each orientation. The Orientation Scales are: Influencing, Organizing, Helping, Creating, Analyzing, Producing, and Adventuring. Each orientation provides both an interest score and a skills score. A respondent can be high or low on both, providing four interest/skill combinations. There are 29 Basic Interest and Skill scales that are subscales of the Orientations and cover specific topics (i.e., public speaking, mathematics, etc.) The CISS is normed on 5,000 people from over 60 different occupations. Campbell, Hyne, and Nilsen (1992) present the technical features of the CISS, including item analysis, scale construction, reliability, and validity.

JPI-R. Tenth, we review Hogan Advantage correlations with the Jackson Personality Inventory - Revised (JPI-R; Jackson, 1994) (see Table 5.10). We obtained data for these correlations through the Eugene-Springfield Community study. Data were limited to participants who completed the HPI and the JPI-R, resulting in a sample of 167 individuals. The sample included 71 males and 96 females. Ages of subjects ranged from 29 years to 79 years with a mean of 49.20 years (*SD* = 9.65).

The JPI-R is a 300-item true-false measure of personality concerning individuals' interpersonal patterns of interaction, cognitive styles, and value orientations, which is primarily intended for use in normal populations. The JPI-R is normed on four different populations, high school students, blue-collar workers, executives, and adults (college students). Jackson (1994) combines the college, blue collar and executive norm groups to form an overall norm group of 1,436 individuals. The JPI-R contains fifteen content scales: Complexity (Cpx), Breadth of Interest (Bdi), Innovation (Inv), Tolerance (Tol), Empathy (Emp), Anxiety (Axy), Cooperativeness (Cpr), Sociability (Soc), Social Confidence (Scf), Energy Level (Enl), Social Astuteness (Sas), Risk Taking (Rkt), Organization (Org), Traditional Values (Trv), and Responsibility (Rsy). These fifteen content scales group into five meaningful clusters: Analytical, Emotional, Extroverted,

Opportunistic, and Dependable. Jackson (1994) presents the technical features of the JPI-R, including item analysis, reliability, factor analysis, and validity.

HBRI. Next, we review Hogan Advantage correlations with the Hogan Business Reasoning Inventory (HBRI; R. Hogan, Barrett, & Hogan, 2007). We administered both the HPI and HBRI to 757 managers and professionals employed in private sector organizations in the U.S. (see Table 5.11). All participants were pursing corporate programs of professional development where the assessments were a component of the program. The sample included 488 males and 247 females (22 individuals did not indicate gender). Ages of subjects ranged from 19 years to 65 years with a mean of 38.27 years (*SD* = 9.97). All had completed a high school education and most had post-graduate training.

The HBRI is a 24-item measure of cognitive skills and business reasoning, intended for use with college educated (Bachelor's degree) managers and professionals. Items reflect cognitive tasks and content similar to work in actual business operations. The HBRI is designed for computer administration. The HBRI is normed on 2,484 university students, adult volunteers, job applicants, and existing employess (R. Hogan, Barrett, & Hogan, 2007). The HBRI contains two scales, strategic reasoning and tactical reasoning. R. Hogan, Barrett, and Hogan (2007) present the technical features of the HBRI, including reliability, scale construction, factor analysis, and validity.

Watson-Glaser. Finally, we review Hogan Advantage correlations with the Watson-Glaser Critical Thinking Appraisal subtests and total test scores (Watson-Glaser; Watson & Glaser, 1980, 2002) (see Table 5.12). We administered both the HPI and the WGCTA to 598 managers in the national transportation industry. The sample included 453 males and 116 females (29 respondents did not indicate their gender). Ages of subjects ranged from 20 years to 55 years with a mean of 24.90 years (*SD* = 10.30).

The Watson-Glaser is a 160-item measure of important abilities involved in critical thinking. Critical thinking is relevant to many occupations, especially those in which careful, analytical thinking is a necessity. The Watson-Glaser is normed on 1,778 business employees and civil service employees and applicants (Watson & Glaser, 1980). The Watson-Glaser consists of five subtests, Inference, Recognition of Assumptions, Deduction, Interpretation, and Evaluation of Arguments. Items contain two types of content, neutral (e.g., weather and scientific facts) and controversial (e.g. political, economic, and social issues). Watson and Glaser (1980) present the technical features of the Watson-Glaser, including reliability and validity.

Table 5.1 Correlations between Hogan Advantage Scales and HPI Scales

HPI Scale	Dependability	Composure	Customer Focus
Adjustment	.15	.88	.64
Ambition	-.14	.37	.45
Sociability	-.49	.07	.23
Interpersonal Sensitivity	.03	.41	.57
Prudence	.53	.40	.50
Inquisitive	-.47	.22	.23
Learning Approach	-.09	.27	.26

Note. N = 28,564; Correlations ≥ .03 are significant at $\rho < .05$ (two-tailed).

Table 5.2 Correlations between Hogan Advantage Scales and HDS Scales

HDS Scale	Dependability	Composure	Customer Focus
Excitable	-.10	-.65	-.51
Skeptical	-.33	-.44	-.46
Cautious	.16	-.43	-.51
Reserved	.00	-.20	-.46
Leisurely	-.16	-.27	-.28
Bold	-.35	-.11	.01
Mischievous	-.60	-.07	-.02
Colorful	-.36	-.08	.14
Imaginative	-.52	-.18	-.11
Diligent	.03	-.14	-.02
Dutiful	.11	-.08	-.07

Note. N = 754; Correlations ≥ .07 are significant at $\rho < .05$ (two-tailed).

Table 5.3 Correlations between Hogan Advantage Scales and CPI Scales

CPI Scale	Dependability	Composure	Customer Focus
Dominance	-.17	.06	.25
Capacity for Status	-.23	.18	.38
Sociability	-.16	.13	.46
Social Presence	-.26	.21	.33
Self-Acceptance	-.23	.06	.28
Independence	-.13	.28	.22
Empathy	-.16	.24	.30
Responsibility	.13	.22	.29
Socialization	.33	.37	.34
Self-Control	.34	.43	.26
Good Impression	.25	.45	.35
Communality	-.11	.17	.27
Well-Being	.08	.57	.48
Tolerance	.14	.28	.39
Achievement via Conformance	.11	.28	.35
Achievement via Independence	-.13	.21	.25
Intellectual Efficiency	-.11	.26	.26
Psychological-Mindedness	-.15	.22	.18
Flexibility	-.16	.08	.07
Femininity/Masculinity	.30	-.28	-.06
Externality/Internality	.28	.04	-.20
Norm-Doubting/Norm-Favoring	.24	.20	.22
Ego-Integration	-.01	.38	.40

Note. N = 160; Correlations ≥ .16 are significant at $\rho < .05$ (two-tailed).

Table 5.4 Correlations between Hogan Advantage Scales and NEO PI-R Scales/Facets

NEO-PI-R Scale/Facet	Dependability	Composure	Customer Focus
Neuroticism	-.08	-.60	-.51
Anxiety	.02	-.56	-.42
Angry Hostility	-.16	-.67	-.35
Depression	-.08	-.46	-.47
Self-Consciousness	.02	-.29	-.46
Impulsiveness	-.13	-.34	-.26
Vulnerability	-.04	-.45	-.40
Extraversion	-.15	.09	.51
Warmth	.12	.13	.50
Gregariousness	-.04	-.02	.51
Assertiveness	-.07	-.03	.26
Activity	-.18	-.01	.20
Excitement-Seeking	-.35	.00	.05
Positive Emotions	-.06	.26	.36
Openness	-.34	.00	.01
Fantasy	-.23	.01	-.08
Aesthetics	-.22	.01	.04
Feelings	-.16	-.20	.08
Actions	-.37	.13	.09
Ideas	-.32	.03	-.05
Values	-.13	-.01	.00
Agreeableness	.30	.32	.24
Trust	.23	.42	.54
Straight-forwardness	.29	.13	.09
Altruism	.24	.23	.33
Compliance	.25	.41	.14
Modesty	.08	.02	-.16
Tender-Mindedness	.09	.01	.04
Conscientiousness	.15	.18	.26
Competence	.14	.27	.31
Order	.13	.05	.22
Dutifulness	.20	.09	.13
Achievement Striving	-.11	.06	.22
Self-Discipline	.13	.21	.23
Deliberation	.24	.16	.08

Note. N = 152; Correlations ≥ .16 are significant at $\rho < .05$ (two-tailed).

Table 5.5 Correlations between Hogan Advantage Scales and IPIP Big 5 20-Item Scales

IPIP Big-Five 20-Item Scale	Dependability	Composure	Customer Focus
Extraversion	-.04	-.03	.47
Agreeableness	.08	.16	.46
Conscientiousness	.09	.09	.16
Emotional Stability	.10	.75	.42
Intellect/Imagination	-.32	.10	.04

Note. N = 131; Correlations ≥ .19 are significant at $\rho < .05$ (two-tailed).

Table 5.6 Correlations between Hogan Advantage Scales and 16PF Scales

16PF Scale	Dependability	Composure	Customer Focus
Warmth	.19	-.08	.40
Reasoning	-.09	-.07	-.12
Emotional Stability	-.03	.55	.49
Dominance	-.29	-.28	.04
Liveliness	-.28	-.03	.20
Rule-Consciousness	.23	.20	.16
Social-Boldness	-.01	.00	.41
Sensitivity	.21	-.16	-.01
Vigilance	-.14	-.33	-.41
Abstractedness	-.35	-.14	-.19
Privateness	-.06	.14	-.25
Apprehension	.04	-.41	-.31
Openness to Change	-.37	-.05	.00
Self-Reliance	-.03	-.05	-.42
Perfectionism	.11	-.08	.08
Tension	-.15	-.50	-.37

Note. N = 157; Correlations ≥ .16 are significant at $\rho < .05$ (two-tailed).

Table 5.7 Correlations between Hogan Advantage Scales and OPQ32 Scales

OPQ32 Scale	Dependability	Composure	Customer Focus
Influence			
Persuasive	-.27	.24	.33
Controlling	-.18	.25	.23
Outspoken	-.30	-.06	.11
Independent Minded	-.43	-.03	-.03
Sociability			
Outgoing	-.24	.13	.49
Affiliative	.04	.14	.47
Socially Confident	-.11	.38	.56
Empathy			
Modest	.15	-.03	-.31
Democratic	.18	.14	.29
Caring	.15	.20	.34
Analysis			
Data Rational	-.10	.10	-.05
Evaluative	-.11	-.02	.10
Behavioral	-.12	.10	.14
Creativity and Change			
Conventional	.50	-.02	.01
Conceptual	-.38	.05	.00
Innovative	-.50	.15	.06
Variety Seeking	-.45	.03	.07
Adaptable	-.01	-.06	-.11
Structure			
Forward Thinking	.09	.01	.20
Detail Conscious	.28	.02	.08
Conscientious	.15	.06	.06
Rule Following	.51	-.02	.01
Emotion			
Relaxed	-.19	.66	.48
Worrying	.26	-.48	-.35
Tough Minded	-.28	.49	.30
Optimistic	-.08	.50	.50
Trusting	.13	.37	.48
Emotionally Controlled	.00	.07	-.34
Dynamism			
Vigorous	-.02	.08	.17
Competitive	-.08	.03	.01
Achieving	-.24	.12	.18
Decisive	-.28	.12	.16

Note. N = 159; Correlations ≥ .16 are significant at $\rho < .05$ (two-tailed).

Table 5.8 Correlations between Hogan Advantage Scales and MVPI Scales

MVPI Scale	Dependability	Composure	Customer Focus
Aesthetics	-.24	-.02	.04
Affiliation	-.21	.16	.35
Altruistic	-.07	.14	.25
Commerce	-.19	.13	.12
Hedonism	-.30	-.19	-.13
Power	-.32	.04	.08
Recognition	-.33	-.11	.00
Science	-.29	.13	.09
Security	.31	.09	.05
Tradition	.09	.04	.09

Note. N = 28,535; Correlations ≥ .02 are significant at $\rho < .05$ (two-tailed).

Table 5.9 Correlations between Hogan Advantage Scales and CISS Interest/Skill Scales

CISS Interest Scale	Dependability	Composure	Customer Focus
Influencing	-.18	.03	.32
Organizing	-.01	-.08	.10
Helping	.08	.07	.25
Creating	-.12	-.07	.08
Analyzing	-.36	.02	-.18
Producing	-.47	.05	-.10
Adventuring	-.29	.14	.12
CISS Skill Scale			
Influencing	-.22	-.01	.20
Organizing	-.11	-.08	.07
Helping	-.08	-.02	.20
Creating	-.22	-.05	.10
Analyzing	-.35	.04	-.13
Producing	-.45	.09	-.07
Adventuring	-.38	.13	.04

Note. N = 141; Correlations ≥ .18 are significant at $\rho < .05$ (two-tailed).

Table 5.10 Correlations between Hogan Advantage Scales and JPI-R Scales

JPI-R Scale	Dependability	Composure	Customer Focus
Analytical Cluster			
Complexity	-.17	-.12	-.10
Breadth of Interest	-.34	.01	.08
Innovation	-.45	.05	.07
Tolerance	-.15	.28	.27
Emotional Cluster			
Empathy	.05	-.31	.06
Anxiety	-.04	-.70	-.36
Cooperativeness	.17	-.14	-.01
Extroverted Cluster			
Sociability	-.04	-.10	.35
Social Confidence	-.12	.04	.44
Energy Level	-.20	.22	.31
Opportunistic Cluster			
Social Astuteness	-.08	-.01	.12
Risk Taking	-.52	.02	-.01
Dependable Cluster			
Organization	.24	.02	.12
Traditional Values	.24	.09	.04
Responsibility	.18	.09	.25

Note. N = 167; Correlations ≥ .17 are significant at $\rho < .05$ (two-tailed).

Table 5.11 Correlations between Hogan Advantage Scales and HBRI Scales

HBRI Scale	Dependability	Composure	Customer Focus
Tactical Reasoning	-.02	.05	.09
Strategic Reasoning	-.08	.03	.04

Note. N = 754; Correlations ≥ .08 are significant at $\rho < .05$ (two-tailed).

Table 5.12 Correlations between Hogan Advantage Scales and Watson-Glaser Scales

Watson-Glaser Scale	Dependability	Composure	Customer Focus
Inference	-.04	-.01	.04
Recognition of Assumptions	-.02	.03	.02
Deduction	-.02	-.02	.03
Interpretation	.03	.02	.04
Evaluation of Arguments	-.08	.00	.05
TOTAL	-.04	.01	.05

Note. N = 598

5.2.3 Results of Scale to Scale Correlates

Dependability. The Dependability scale predicts behaviors ranging from reliable and hard work at the high end to carelessness and inconsistent performance at the low end. Dependable people tend to follow organizational policies and procedures, prioritize work and work-related activities, respond appropriately to supervision, and follow assigned tasks through to completion. Consequently, these individuals frequently emerge as top performers. Others view them as trustworthy and predictable.

It is likely that, as children and adolescents, these people learned to accommodate authority by adhering to established rules, following established norms regarding timeliness and attendance, and finishing what they started. These are the adults who, as children, received perfect attendance awards at school and "colored within the lines." As a result, high scores on the Dependability scale are associated with acting with integrity, earning others' trust, and producing quality work. Negative behaviors associated with low scores include rebelliousness, inconsistency in performance, potential insubordination, and questionable integrity.

Tables 5.1 through 5.7 contain correlations between the Dependability scale and other major personality assessments. Table 5.1 indicates that the Dependability scale correlates most strongly with the HPI scales that include component HICs of Dependability. Specifically, Dependability has the largest positive correlation (.53) with the Prudence scale of the HPI. Dependability demonstrates negative correlations of -.49 and -.47 with the Sociability and Inquisitive scales of the HPI, respectively. This pattern of correlations underscores the nature of the scale, with highly dependable individuals being conscientious and not intellectually curious or experience-seeking. Table 5.2 indicates that the Dependability scale is correlated most strongly with the HDS Mischievous (-.60) and Imaginative (-.52) scales. This suggests that high scorers on the Dependability scale appear risk-averse and practical. Dependability correlates with the Colorful (-.36) and Bold (-.35) scales of the HDS at -.35 or greater, showing that individuals who are high on Dependability appear responsible and self-restrained. Table 5.3 presents correlations between the Dependability scale and the CPI scales. These correlations suggest two characteristics. First, strong negative correlations with the Social Presence (-.26), Capacity for Status (-.23), and Self-Acceptance (-.23) scales suggest that high scorers are unlikely to demand status or call attention to themselves. They are likely to strive to fulfill their need for accomplishment. Second, strong positive correlations with the Self-Control (.34), Socialization (.33), and Good Impression (.25) scales suggest that high scorers internalize social norms, comply with rules, and seek favorable impressions from others. Table 5.4

displays relations between Dependability and the NEO-PI-R scales. Strongly negative correlations with the Openness scale (-.34) and its facets suggests that highly dependable people will not seek new experiences or indulge in fantasy. A similarly negative correlation with the Excitement-Seeking facet (-.35) of Extraversion corroborates this view. However, strong positive correlations with Agreeableness (.30) and its facets, as well as the Deliberation (.24) and Dutifulness (.20) facets of Conscientiousness, suggest that high scorers will comply with directions given by their supervisors. Table 5.5 shows a similar pattern of results for the Intellect/Imagination IPIP scale (-.32), suggesting that dependable people stay on-task and do not let their imaginations carry them away from their work. Table 5.6 presents correlations between the Dependability scale and the 16PF scales. Dependability is most strongly correlated with 16PF Rule-Consciousness scale (r = .23). Although the 16PF is not structured according to the FFM, an inspection of the correlations indicates good convergent and discriminant validity for the Dependability scale, with correlations with Sensitivity (.21), Warmth (.19), Openness to Change (-.37), and Abstractedness (-.35) in expected directions and magnitudes. Table 5.7 presents correlations between Dependability and the OPQ32. As expected, this table shows that Dependability is negatively related to the Innovative (-.50), Variety Seeking (-.45), Independent Minded (-.43), Conceptual (-.38), and Outspoken (-.30) scales, suggesting that highly dependable people are unlikely to step out of line or seek new methods to get the job done when existing methods are effective. Positive correlations with the Rule Following (.51), Conventional (.50), and Detail Conscious (.28) scales confirm these observations.

Tables 5.8 through 5.10 contain correlations between the Dependability scale and selected motives and interest inventories. Table 5.8 indicates that Dependability is significantly and negatively related to the MVPI Science, Recognition, Power, Hedonism, Aesthetics, Commerce, and Affiliation scales, with all correlations -.19 or stronger. These results suggest that scientific curiosity, gaining recognition for their work, gaining positions of power, having a good time with others, appearance of work products, and making money do not drive individuals high on Dependability. In contrast, the strong correlation with MVPI Security (.31) indicates that risk-free environments providing predictability and consistency motivate these individuals as such environments fulfill their need to "get the job done." Table 5.9 shows correlations between Dependability and the CISS interest and skill scales. Relationships with Influencing, Analyzing, and Adventuring scales are negative. Table 5.10 presents correlations between the Dependability scale and the JPI-R scales, which are rooted in Murray's (1938) needs. As with the personality scales, the highest negative correlation is with the Risk Taking scale (r = -.52), which is part of the Opportunistic Cluster. Similar findings for the Innovation (-.45) and Breadth of Interest (-.34) scales of the Analytical Cluster

also match earlier observations. Correlations with the Dependability Cluster are positive, at .24, .24, and .18 with Organization, Traditional Values, and Responsibility, respectively.

Finally, Tables 5.11 and 5.12 contain correlations between the Dependability scale and two cognitive measures. Generally, cognitive ability is unrelated to Dependability. For the HBRI, the relationship of Dependability with Strategic Reasoning (-.08) is statistically significant, but not particularly meaningful due to the large sample size. Dependability is uncorrelated with the Watson-Glaser Critical Thinking Appraisal scale, often used for managerial assessments (Watson & Glaser, 1980).

Composure. The Composure scale predicts behaviors ranging from remaining calm and focused under pressure at the high end to becoming upset and requiring reassurance at the low end. High scorers tend to cope with stress through constructive, task-focused mechanisms. Consequently, these individuals frequently succeed in stressful jobs where resilience represents a core worker characteristic. In this context, others view high scorers as calm under pressure.

It is likely that, as children and adolescents, these individuals experienced stressful, but non-threatening, situations. As a result, they became stress-tolerant and gained confidence, learning that they could handle stress without resorting to ineffective emotion-based and avoidant behavior. These are the adults who, as children, learned to deal with setbacks effectively. As a result, high scores on the Composure scale are associated with remaining calm, relaxed, and focused under pressure. Negative behaviors associated with low scores include becoming easily frustrated, nervous, and irritable when challenged or threatened.

Tables 5.1 through 5.7 contain correlations between the Composure scale and other major personality assessments. Table 5.1 indicates that Composure correlates most strongly with the HPI Adjustment scale (.88) which includes the component HICs of Composure. Composure demonstrates substantial correlations with Interpersonal Sensitivity (.41), Prudence (.40), and Ambition (.37). This pattern of correlations underscores the nature of the scale, as individuals high on Composure are well-adjusted, outgoing, tactful, and conscientious. Table 5.2 indicates that the Composure scale is most strongly correlated with the HDS Excitable (-.65) scale. This suggests that high scorers on the Composure scale appear emotionally stable on the HDS. Composure shows negative correlations with the HDS Skeptical (-.44), Cautious (-.43), Leisurely (-.27), and Reserved (-.20) scales at -.20 or stronger, indicating that composed

individuals tend not to act out or withdraw from others under stressful conditions. Table 5.3 presents correlations between the Composure scale and the CPI scales. These correlations appear consistent with the main characteristics of the Composure scale. First, the strongest correlation with Composure is for the Well-Being (.57) scale. This finding suggests that high scorers feel that they relate well to others and avoid becoming irritated or annoyed under stress. Other strong positive correlations with the Good Impression (.45), Self-Control (.43), Socialization (.37), and Tolerance (.28) scales suggest that high scorers work to make good impressions on others and are rule-compliant, socially engaged, and tolerant. Table 5.4 displays relations between Composure and the NEO-PI-R scales. Strong negative correlations with the Neuroticism scale (-.60) and its facets suggests that composed individuals will not behave in an anxious, hostile, or impulsive manner under stress. However, strong positive correlations with the Agreeableness (.32) scale and its facets suggest that high scorers will appear trusting, altruistic, and compliant. Positive correlations with the Positive Emotions (.26) facet of Extraversion and the Self-Discipline (.21) facet of Conscientiousness, and a negative correlation with the Feelings (-.20) facet of Openness, further describe composed individuals as those sufficiently disciplined to maintain a positive outlook and avoid emotional responses under periods of stress. The strong correlation presented in Table 5.5 between Composure and the IPIP Emotional Stability (.75) scale also suggests a calm state for composed individuals. Table 5.6 presents correlations between the Composure scale and the 16PF scales. This table reiterates the results presented for the IPIP, with the strongest positive correlation for Composure and Emotional Stability (.55). The positive correlation with Rule-Consciousness (.20) also suggests that composed individuals conform to social norms. Negative correlations suggest that composed individuals do not appear tense (Tension r = -.50), self-doubting (Apprehension r = -.41), suspicious (Vigilance r = -.33), or emotionally reactive (Dominance r = -.28). Table 5.7 presents correlations between Composure and the OPQ32. Positive correlations with the Relaxed (.66), Optimistic (.50), Tough Minded (.49), Socially Confident (.38), and Trusting (.37) scales underscore the nature of composed individuals as calm, poised, and positive. The negative correlation with the Worrying (-.48) scale reiterates these observations.

Tables 5.8 through 5.10 contain correlations between the Composure scale and selected motives and interest inventories. Table 5.8 indicates that Composure significantly and negatively relates to the MVPI Hedonism and Recognition scales, with respective correlations of -.19 and -.11. These results suggest that publicity and excitement do not drive composed individuals. In contrast, the significant positive correlations with MVPI Affiliation (.16) and Altruistic (.14) values indicate that social interaction and opportunities to help others drive

these individuals. Table 5.9 shows correlations between Composure and the CISS interest and skill scales. No significant results emerged in this table. Table 5.10 presents correlations between the Composure scale and the JPI-R scales, which are rooted in Murray's (1938) needs. Similar to the personality scales, the strongest negative correlations are with the Anxiety (-.70) and Empathy (-.31) scales, both parts of the Emotional Cluster. The strongest positive relations appear with the Tolerance (.28) scale of the Analytical Cluster and the Energy Level (.22) scale of the Extroverted cluster.

Finally, Tables 5.11 and 5.12 contain correlations between the Composure scale and two cognitive measures. As results for both the HBRI and the Watson-Glaser indicate, cognitive ability is unrelated to Composure.

Customer Focus. The Customer Focus scale predicts behaviors ranging from relating to customers in a friendly and positive manner at the high end to doing so in an irritable or even rude manner at the low end. High scorers tend to listen to their customers' questions, concerns, and problems, and attend to those issues in a polite, patient, and helpful manner. Consequently, these individuals frequently succeed in jobs where client interactions represent a core job component, viewed by customers as considerate and service-oriented.

It is likely that, as children and adolescents, these people were discouraged for rude, selfish, and inattentive behavior, and rewarded for being polite, positive, and considerate of others. These are adults who, as children, learned to consider others first, were rewarded for making others happy, and "helped old ladies cross the street." As a result, high scores on the Customer Focus scale are associated with being cooperative, personable, and responsive. Negative behaviors associated with low scores include discourteous, inattentive, or inconsiderate interpersonal interactions.

Tables 5.1 through 5.7 contain correlations between the Customer Focus scale and other major personality assessments. Table 5.1 indicates that Customer Focus correlates strongly with the HPI scales that include component HICs of Customer Focus. Specifically, Customer Focus has strong correlations with the Ambition and Interpersonal Sensitivity scales of the HPI, at .45 and .57, respectively. Customer Focus demonstrates substantial correlations with Adjustment (.64) and Prudence (.50). This pattern of correlations underscores the nature of the scale, with customer-focused individuals being well-adjusted, outgoing, tactful, and conscientious. Table 5.2 indicates that the Customer Focus scale is correlated with the HDS Excitable (-.51) and Cautious (-.51) scales most strongly. This suggests that high scorers on the Customer Focus scale appear emotionally mature and confident. Customer Focus correlates with the Skeptical

(-.46), Reserved (-.46), and Leisurely (-.28) scales of the HDS at -.28 or stronger, indicating that customer-focused individuals do not withdraw from others, even when under stress. Table 5.3 presents correlations between the Customer Focus scale and the CPI scales. These correlations are consistent with the main characteristics of customer-focused people. First, the correlation with the Well-Being (.48) scale suggests that high scorers possess a sufficient sense of adequacy to allow them to relate well with others and avoid reacting with of irritation or annoyance. Other strong positive correlations with the Sociability (.46), Socialization (.34), and Tolerance (.39) scales suggest that high scorers are socially engaged and tolerant. Table 5.4 displays relations between Customer Focus and the NEO-PI-R scales. Strongly negative correlations with the Neuroticism scale (-.51) and its facets suggests that customer-focused individuals do not exhibit anxious, hostile, or impulsive behaviors. Strong positive correlations with the Extraversion (.51), Conscientiousness (.26), and Agreeableness (.24) scales and their constituent facets suggest that high scorers are outgoing, service-oriented, and competent. Reversing the polarity of the CPI Neuroticism scale, Table 5.5 shows a similar pattern of results for the IPIP scales to those found for the CPI. Specifically, significant correlations with the IPIP Emotional Stability (.42), Extraversion (.47), Agreeableness (.46), and Conscientiousness (.16) scales suggest that customer-focused individuals remain calm under stress and actively seek out opportunities to help others. Table 5.6 presents correlations between the Customer Focus scale and the 16PF scales. As expected, Customer Focus correlates most strongly in the positive direction with Emotional Stability (.49), Social-Boldness (.41), and Warmth (.40). Negative correlations with Customer Focus indicate that customer-focused individuals are not appearing suspicious (Vigilance r = -.41), solitary (Self-Reliance r = -.42), self-doubting (Apprehension r = -.31), tense (Tension r = -.37), or impractical (Abstractedness r = -.19). Table 5.7 presents correlations between Customer Focus and the OPQ32. Positive correlations with the Socially Confident (.56), Optimistic (.50), Outgoing (.49), Relaxed (.48), Trusting (.48), and Affiliative (.47) scales suggest that highly customer focused individuals will appear gregarious, calm, and confident in social interactions. Negative correlations with Worrying (-.35) and Modest (-.31) scales provide further support for these characterizations.

Tables 5.8 through 5.10 contain correlations between the Customer Focus scale and selected motives and interest inventories. Table 5.8 indicates that Customer Focus significantly and negatively relates to the MVPI Hedonism scale (r = -.13). This result suggests that pleasure and excitement do not drive customer-focused individuals. In contrast, the strong positive correlations with MVPI Affiliation (.35) and Altruistic (.25) values indicate that social interactions and opportunities to help others drive these individuals. Table 5.9 shows correlations between Customer Focus and the CISS interest and skill scales. Significant positive

correlations with interests and skills in Influencing and Helping scales reflect correlations from the MVPI. Table 5.10 presents correlations between the Customer Focus scale and the JPI-R scales, which are rooted in Murray's (1938) needs. As with the personality scales, the highest negative correlation is with the Anxiety scale (r = -.36), which is part of the Emotional Cluster. Correlations with the Extroverted Cluster are positive, at .44, .35, and .31 with Social Confidence, Sociability, and Energy Level respectively.

Finally, Tables 5.11 and 5.12 contain correlations between the Customer Focus scale and two cognitive measures. Generally, cognitive ability is unrelated to Customer Focus. For the HBRI in Table 5.11, the relationship of Customer Focus with Tactical Reasoning (.09) is statistically significant, but not particularly meaningful due to the large sample size. Table 5.12 shows that Customer Focus is uncorrelated with the Watson-Glaser Critical Thinking Appraisal scale, often used for managerial assessments (Watson & Glaser, 1980).

5.3 Correlations with Others' Descriptions

In this section, we present correlations between Hogan Advantage scale scores and descriptions of a person's performance and/or characteristics as rated by observers using standardized checklists. These analyses provide another method to evaluate construct validity of the Hogan Advantage scales. In addition, this is a rich source of information to guide practitioners' interpretations of results from the Hogan Advantage. In this section, we provide correlation matrices for the Hogan Advantage scales and three separate descriptive instruments, including adjectives, personality phrases, and work-oriented descriptive phrases. Note that results represent self-other relations, in contrast to self-self ratings reported in section 5.2. Self-self correlations, although not presented here, are available from Goldberg's (2008) Eugene-Springfield Community Sample.

5.3.1 Procedure We collected HPI data using online internet testing in both proctored and unproctored conditions, and calculated Hogan Advantage scale scores based on those data. The data presented in this chapter come from multiple studies specifically designed to assess construct validation between Hogan assessments and other instruments. Although Hogan researchers lead many of these efforts, external researchers in both academic and applied settings collected data for other instruments. Specifically, we obtained data for several comparisons through the longitudinal Eugene-Springfield Community Sample coordinated by Dr. Lewis Goldberg. Dr. Goldberg recruited approximately 1,000 individuals to participate in the project. However, because Dr. Goldberg collected data on 30 different assessments, only a portion of this sample completed each instrument.

5.3.2 Samples and Instruments

Adjectival Descriptions. We provide adjectival descriptive correlates between the Hogan Advantage scales and Big Five "Mini-Marker" adjectives. As part of Lewis Goldberg's longitudinal Eugene-Springfield Community study, respondents and observers (e.g., significant others, spouses, friends, acquaintances, coworkers) completed the *Self/Peer Inventories*, partly composed of items taken from Saucier's (1994) 40-item Big-Five "Mini-Markers." These results appear in Table 5.13. In this survey, respondents described how well each adjective described the target individual using a 5-point Likert scale ranging from "1" (*Extremely Inaccurate*) to "5" (*Extremely Accurate*).

Up to four observers completed these items. Observers responded to items assessing how and how well they knew the target, how much they liked the target, and basic demographic questions on gender and age. The sample of 1,756 respondents providing observer ratings included 655 males and 1,095 females. Six observers did not provide gender data. Ages of observers ranged from 6 to 94 with a mean of 48.31 years (SD = 17.77). Observers were nearly evenly split between spouses/other relatives (N = 883) and friends, coworkers, acquaintances, and significant others (N = 854). Nineteen observers did not indicate their relationship to the target. Most observers indicated knowing the target "well" or "very well" (N = 1,740), and most indicated that they "liked" the target or liked the target "very much" (N = 1,671). For each of the items, we pooled observer ratings into a composite by calculating a mean response across all observers. We used these mean responses as the basis for calculating correlations between observer ratings and Hogan Advantage scales.

Personality Phrases. We provide results from two sources of descriptive phrases. First, as part of the Eugene-Springfield Community study, respondents and observers completed the *Self/Peer Inventories.* In addition to the 40 adjectival items described above, this survey also included 44 items from the Big-Five Inventory (John & Srivastava, 1999; Benet-Martinez & John, 1998). Again, two additional items included in this survey assessed physical attractiveness. Results from the Big-Five Inventory personality phrases appear in Table 5.14. Again, respondents described how well each phrase described either themselves or the target individual using a 5-point Likert scale ranging from "1" (*Extremely Inaccurate*) to "5" (*Extremely Accurate*).

Up to four observers of each participant completed these items. Observers responded to items assessing how and how well they knew the target, how much they liked the target, and basic demographic questions on gender and age. The sample of 1,756 respondents providing observer ratings included 655 males and

1,095 females (six observers did not provide gender data). Ages of observers ranged from 6 years to 94 years with a mean of 48.31 years (*SD* = 17.77). Observers were nearly evenly split between spouses/other relatives (*N* = 883) compared with friends, coworkers, acquaintances, and significant others (*N* = 854), with 19 observers not indicating their relationship to the target. Most observers indicated knowing the target "well" or "very well" (*N* = 1,740), and most indicated that they "liked" the target or liked the target "very much" (*N* = 1,671). For each of the items, observer ratings were pooled into a composite by calculating a mean response across all observers. We used these mean responses as the basis for calculating correlations between observer ratings and Hogan Advantage scales.

The California Q-Set (CQS; Block, 1961) represents the second source of descriptive phrase correlates provided for the Hogan Advantage scales. In this survey, respondents indicated whether each of 100 phrases described the target individual by checking "yes" or "no" for each adjective based on whether or not they described the target.

Two observers completed these items for each target individual. The sample of 86 respondents providing these ratings included 28 males and 50 females (eight respondents did not indicate their gender). Ages of respondents ranged from 19 to 52 years with a mean of 25.91 years (*SD* = 7.46). Table 5.15 lists the five strongest positively correlated and the five strongest negatively correlated descriptive phrases with each Hogan Advantage scale. The full list of phrases and their correlations appears in Appendix C.

Table 5.13 Hogan Advantage Correlations with Observer Ratings for Big Five Mini-Markers

Big-Five Mini-Marker Adjective	Dependability	Composure	Customer Focus
Bashful	.06	.06	-.27
Bold	-.22	-.19	.08
Careless	-.14	.04	-.06
Cold	-.11	-.02	.02
Complex	-.17	-.19	-.04
Cooperative	.16	.12	.12
Creative	-.06	-.01	.03
Deep	-.18	-.05	-.06
Disorganized	-.20	.02	-.11
Efficient	.23	-.06	.11
Energetic	-.17	.02	.23
Envious	-.08	-.23	-.12
Extraverted	-.03	-.18	.25
Fretful	.08	-.33	-.22
Good-looking	.06	-.02	.14
Harsh	-.15	-.13	-.01
Imaginative	-.15	-.01	.01
Inefficient	-.17	-.07	-.24
Intellectual	-.14	-.09	-.05
Jealous	-.05	-.17	-.14
Kind	.15	-.08	.06
Moody	-.08	-.24	-.31
Organized	.24	-.05	.06
Philosophical	-.12	-.12	-.03
Practical	.18	.08	.13
Quiet	.01	.21	-.11
Relaxed	-.01	.27	.12
Rude	-.21	-.11	-.04
Shy	-.01	.10	-.24
Sloppy	-.16	.01	-.12
Sympathetic	.17	-.08	.07
Systematic	.13	-.09	.06
Talkative	.02	-.23	.00
Temperamental	-.13	-.28	-.15
Touchy	.03	-.22	-.06
Unattractive	.01	.05	-.17
Uncreative	.16	-.02	-.05
Unenvious	.07	.19	.08
Unintellectual	.14	.01	.05
Unsympathetic	-.13	-.08	-.08
Warm	.08	-.13	.13
Withdrawn	-.09	.06	-.32

Note. N = 160; Correlations ≥ .16 are significant at $\rho < .05$ (two-tailed).

Table 5.14 Hogan Advantage Correlations with Observer Ratings for Big-Five Inventory Phrases

Big-Five Inventory Phrase	Dependability	Composure	Customer Focus
A reliable worker	-.04	.05	.18
Can be cold and aloof	-.19	.08	-.08
Can be moody	.00	-.20	-.26
Can be somewhat careless	-.16	.02	-.10
Can be tense	.01	-.36	-.13
Considerate and kind to almost everyone	.14	.09	.14
Curious about many different things	-.19	-.10	-.09
Does a thorough job	.12	-.10	.03
Does things efficiently	.16	.03	.16
Easily distracted	-.13	-.20	-.20
Emotionally stable/not easily upset	.02	.39	.30
Finds faults with others	-.10	-.32	-.07
Full of energy	-.20	.13	.24
Generally trusting	.07	.07	.09
Generates a lot of enthusiasm	-.16	-.12	.14
Gets nervous easily	.07	-.31	-.21
Has a forgiving nature	.19	.04	.05
Has an active imagination	-.26	-.09	-.02
Has an assertive personality	-.12	-.22	.14
Has few artistic interests	.23	.08	.05
Helpful & unselfish with others	.18	.03	.09
Ingenious/deep thinker	-.17	-.11	-.12
Inventive	-.21	.04	.02
Is depressed/blue	-.10	-.42	-.37
Is reserved	-.02	.25	-.15
Likes to cooperate with others	.14	.08	.14
Likes to reflect/play with ideas	-.30	-.04	-.02
Makes plans and follows through	.13	.13	.24
Not good-looking	.04	-.04	-.16
Original/comes up with new ideas	-.23	-.05	-.01
Outgoing/sociable	.02	-.15	.35
Perseveres until the task is finished	.12	.07	.20
Physically attractive	.01	.00	.15
Prefers routine work	.29	.00	-.04
Relaxed/handles stress well	-.06	.33	.20
Remains calm in tense situations	-.05	.40	.22
Sometimes rude to others	-.25	-.21	-.13
Sometimes shy/inhibited	-.01	.11	-.18
Sophisticated in art, music, literature	-.14	-.11	-.06
Starts quarrels with others	-.11	-.23	.00
Tends to be disorganized	-.18	-.08	-.14
Tends to be lazy	.02	-.06	-.29
Tends to be quiet	-.05	.18	-.13
Values artistic, aesthetic experiences	-.15	-.13	.04
Worries a lot	.00	-.32	-.20

Note. N = 160; Correlations ≥ .16 are significant at $\rho < .05$ (two-tailed).

Table 5.15 Hogan Advantage Correlations with California Q-Set (CQS) Descriptive Phrases

Hogan Advantage Scale & CQS Phrase	**r**
Dependability	
Genuinely submissive; accepts domination comfortably	.30
Is protective of those close to him or her	.23
Behaves in a sympathetic or considerate manner	.21
Is vulnerable to real or fancied threat; generally fearful	.21
Arouses nurturant feelings in others	.18
Tends toward over-control of needs and impulses; binds tensions excessively; delays gratification unnecessarily	-.24
Thinks and associates to ideas in unusual ways; has unconventional thought processes	-.27
Values own independence and autonomy	-.32
Is critical; skeptical; not easily impressed	-.35
Characteristically pushes and tries to stretch limits; sees what he or she can get away with	-.41
Composure	
Is calm; relaxed in manner	.35
Is comfortable with uncertainty and complexity	.30
Has a clear-cut, internally consistent personality	.28
Emphasizes being with others; gregarious	.27
Judges self and others in conventional terms like "popularity," "the correct thing to do," social pressures, etc.	.27
Tends to be self-defensive	-.30
Has fluctuating moods	-.36
Is basically anxious	-.36
Is thin-skinned; sensitive to anything that can be construed as criticism or an interpersonal slight	-.38
Is sensitive to anything that can be construed as a demand	-.43
Customer Focus	
Emphasizes being with others; gregarious	.45
Regards self as physically attractive	.41
Is personally charming	.39
Is cheerful	.39
Tends to arouse liking and acceptance in people	.31
Has fluctuating moods	-.28
Is unpredictable and changeable in behavior and attitudes	-.29
Extra-punitive; tends to transfer or project blame	-.30
Is emotionally bland; has flattened affect	-.31
Is basically distrustful of people in general; questions their motivations	-.35

Note. N = 84; Correlations ≥ .22 are significant at $\rho < .05$ (two-tailed).

5.3.3 Results of Scale and Observer Description Correlates

Dependability. Table 5.13 contains correlations between Dependability scores and peer ratings for Big Five Mini-Marker adjectives. We report the five items with largest positive correlations and five with the largest negative correlations below.

Organized (.24)	Bold (-.22)
Efficient (.23)	Rude (-.21)
Practical (.18)	Disorganized (-.20)
Sympathetic (.17)	Deep (-.18)
Cooperative (.16)	Inefficient (-.17)

Table 5.14 presents correlations between Dependability scores and observer ratings for the Big-Five Inventory personality phrases. We report the five phrases with the largest positive correlations and the five with the largest negative correlations below.

Prefers routine work (.29)	Likes to reflect/play with ideas (-.30)
Has few artistic interests (.23)	Has an active imagination (-.26)
Has a forgiving nature (.19)	Sometimes rude to others (-.25)
Helpful & unselfish with others (.18)	Original/comes up with new ideas (-.23)
Does things efficiently (.16)	Inventive (-.21)

Table 5.15 presents correlations between Dependability scores and observer ratings for the California Q-Set (CQS) personality phrases. We report the five phrases with the largest positive correlations and the five with the largest negative correlations below.

Genuinely submissive; accepts domination comfortably (.30)	Characteristically pushes and tries to stretch limits; sees what he or she can get away with (-.41)
Is protective of those close to him or her (.23)	Is critical; skeptical; not easily impressed (-.35)
Behaves in a sympathetic or considerate manner (.21)	Values own independence and autonomy (-.32)
Is vulnerable to real or fancied threat; generally fearful (.21)	Thinks and associates to ideas in unusual ways; has unconventional thought processes (-.27)
Arouses nurturant feelings in others (.18)	Tends toward over-control of needs and impulses; binds tensions excessively; delays gratification unnecessarily (-.24)

Composure. Table 5.13 contains correlations between Composure scores and peer observer ratings for the Big Five Mini-Marker adjectives. We report the five items with the largest positive correlations and the five with the largest negative correlations below.

Relaxed (.27)	Fretful (-.33)
Quiet (.21)	Temperamental (-.28)
Unenvious (.19)	Moody (-.24)
Cooperative (.12)	Envious (-.23)
Shy (.10)	Talkative (-.23)

Table 5.14 presents correlations between Composure scores and observer ratings for the Big-Five Inventory personality phrases. We report the five phrases with the largest positive correlations and the five with the largest negative correlations below.

Remains calm in tense situations (.40)	Is depressed/blue (-.42)
Emotionally stable/not easily upset (.39)	Can be tense (-.36)
Relaxed/handles stress well (.33)	Worries a lot (-.32)
Is reserved (.25)	Finds faults with others (-.32)
Tends to be quiet (.18)	Gets nervous easily (-.31)

Table 5.15 presents correlations between Composure scores and observer ratings for the California Q-Set (CQS) personality phrases. We report the five phrases with the largest positive correlations and the five with the largest negative correlations below.

Is calm; relaxed in manner (.35)	Is sensitive to anything that can be construed as a demand (-.43)
Is comfortable with uncertainty and complexity (.30)	Is thin-skinned; sensitive to anything that can be construed as criticism or an interpersonal slight (-.38)
Has a clear-cut, internally consistent personality (.28)	Is basically anxious (-.36)
Emphasizes being with others; gregarious (.27)	Has fluctuating moods (-.36)
Judges self and others in conventional terms like "popularity," "the correct thing to do," social pressures, etc. (.27)	Tends to be self-defensive (-.30)

Customer Focus. Table 5.13 contains correlations between Customer Focus scores and peer observer ratings for the Big Five Mini-Marker adjectives. We report the five items with the largest positive correlations and the five with the largest negative correlations below.

Extraverted (.25)	Withdrawn (-.32)
Energetic (.23)	Moody (-.31)
Practical (.13)	Bashful (-.27)
Warm (.13)	Shy (-.24)
Cooperative (.12)	Inefficient (-.24)

Table 5.14 presents correlations between Customer Focus scores and observer ratings for the Big-Five Inventory personality phrases. We report the five phrases with the largest positive correlations and the five with the largest negative correlations below.

Outgoing/sociable (.35)	Is depressed/blue (-.37)
Emotionally stable/not easily upset (.30)	Tends to be lazy (-.29)
Makes plans and follows through (.24)	Can be moody (-.26)
Full of energy (.24)	Gets nervous easily (-.21)
Remains calm in tense situations (.22)	Worries a lot (-.20)

Table 5.15 presents correlations between Customer Focus scores and observer ratings for the California Q-Set (CQS) personality phrases. We report the five phrases with the largest positive correlations and the five with the largest negative correlations below.

Emphasizes being with others; gregarious (.45)	Is basically distrustful of people in general; questions their motivations (-.35)
Regards self as physically attractive (.41)	Is emotionally bland; has flattened affect (-.31)
Is personally charming (.39)	Extra-punitive; tends to transfer or project blame (-.30)
Is cheerful (.39)	Is unpredictable and changeable in behavior and attitudes (-.29)
Tends to arouse liking and acceptance in people (.31)	Has fluctuating moods (-.28)

5.4 Cross Validation When we developed the Hogan Advantage scales to predict specific areas commonly associated with performance in entry-level jobs, we expected that an average score across the three scales would predict overall job performance. To test this hypothesis, we identified cross-validation samples in the Hogan archive. These samples represented studies not used as part of the initial development or validation of the three scales. To be included, studies had to (a) include job analysis information, (b) contain HPI HIC data, (c) use a concurrent or predictive validation strategy, (d) contain criterion data explicit to overall job performance, and (e) represent entry-level jobs. In addition, we excluded studies if they (a) were not conducted with the assistance of Hogan researchers, (b) contained only self-report criterion data, or (c) were unrelated to work contexts (e.g., student performance).

We identified five studies in the Hogan archive that met these criteria. These studies contained predictor data and overall job performance ratings from 405 individuals who took the assessments as either incumbents or applicants who were subsequently hired and rated by their supervisors. Jobs varied across studies, with most studies including more than one entry-level job. Industry sectors represented in these studies included manufacturing, transportation, and construction.

Using the same meta-analysis methods previously described, we examined correlations between average scores on the three Hogan Advantage scales and measures of overall job performance. Table 5.16 presents these results.

Table 5.16 Validity Results for Average Scale Score and Overall Job Performance

Scale	k	N	r_{obs}	SD_r	ρ	SD_ρ	%VE	80% CV	95% CI
Average Score	5	405	.22	.10	.30	.14	100	.22	.13

Note. Results corrected for criterion unreliability. k = Number of correlations; N = Sample size; r_{obs} = Observed mean correlation; SD_r = Sample-weighted standard deviation; ρ = Sample weighted correlation corrected for unreliability in the criteria; SD_ρ = Standard deviation of the corrected population correlation; %VE = Percent of variance accounted for by sampling error and artifact corrections' 90% CV = lower 10% boundary of 80% Credibility Interval; 95% CI = lower 2.5% boundary of 95% Confidence Interval.

As shown in this table, the sample-weighted correlation was .22, which exceeds results previously found between any individual personality scale and measures of overall job performance. The lower bound of the 80% credibility interval, which does not contain zero, suggests that this result remains consistent across the entry-level jobs used as cross-validation samples. Furthermore, the lower bound of the 95% confidence interval, which does not contain zero, indicates that the results are statistically significant.

Analyses indicated very little range restriction in the five samples examined relative to the normative dataset for the HPI (R. Hogan & Hogan, 2007). Therefore, we only corrected results for unreliability in the criterion. The resulting corrected correlation was .30. Again, this result surpasses those previously found between individual personality scales and overall job performance.

6 - INTERPRETATION

6.1 Introduction We designed the Hogan Advantage primarily for use in personnel selection, individualized assessment, and career-related decision making. It provides information regarding characteristics that appear in social interaction and that facilitate or inhibit a person's ability to demonstrate three competencies required for successful performance across entry-level jobs.

- The Hogan Advantage, developed using the HPI, predicts occupational success using normal personality and interpersonal characteristics.

- The Hogan Advantage provides information on how others will perceive an individual instead of how the person sees himself or herself. This perspective is possible because validation of the Hogan Advantage included observers' descriptions of the target individual's behavior and job performance.

- The 74 items comprise three primary scales and one validity scale. We present participant scores for each scale in terms of percentiles.

- Scores on the Hogan Advantage scales indicate the percentile at which the individual's raw score falls relative to the normative sample, described in Chapter 8.

- *High scores* are those at or above the 96th percentile.

- *Above average scores* range from the 76th to the 95th percentiles.

- *Average scores* range from the 26th to the 75th percentiles.

- *Below average scores* range from the 6th to the 25th percentiles.

- *Low scores* are those at or below the 5th percentile.

- Empirical research support provides a foundation for all interpretive statements supporting each scale.

This chapter provides suggestions and examples regarding how to interpret results on the Hogan Advantage. For each Hogan Advantage scale, we provide brief summaries of the behavioral characteristics of individuals scoring at low, average, or high ranges.

6.2 Scale-by-Scale Interpretation Below, we describe behavioral characteristics associated with different score ranges for each of the three Hogan Advantage scales. We derived most of these interpretive statements from descriptions provided by coworkers and the relationships demonstrated between each scale and scores on other psychological assessments of personality, values and motives, and cognitive ability (see Chapter 5).

Higher scores on any Hogan Advantage scale do not indicate that the individual will demonstrate behaviors associated with that scale score in *every* circumstance. Rather, higher scores indicate a greater likelihood that the behavior will generally emerge across *most* situations.

6.2.1 Dependability The Dependability scale measures the degree to which a person will follow established rules and procedures, make work and work-related activity a priority, accept supervision, and follow through on assigned tasks and responsibilities. Below, we present behavioral characteristics describing individuals whose scores on this scale fall in the above average and high ranges, the average range, and the below average and low ranges.

- *Performance Implications of Above Average (76% - 95%) and High Scores (96% - 100%).* Higher scoring individuals are conscientious and more interested in getting the job done than socializing at work. These individuals take an organized, responsible, and practical approach to their work, not taking uncalculated or unnecessary risks or unduly calling attention to themselves. Highly dependable individuals also internalize the rules and regulations of their environments and comply with supervisor directions, seeking to make good impressions on those around them as someone on whom others can rely. Driven by job security and accepted values, these individuals dutifully and deliberately perform their required tasks and avoid indulging in fantasy. Others describe these individuals as efficient, cooperative, and submissive.

- *Performance Implications of Average Scores (26% - 75%).* Average scoring individuals take a balanced approach to work, socializing with others while working to complete job tasks. Although these individuals are aware of their responsibilities, their work performance may be inconsistent and they may occasionally take unnecessary risks in the completion of job tasks. Unlike high scorers, these individuals may take bold actions and put themselves at the center of attention while working to fulfill their responsibilities. These individuals tend to abide by organizational policies and procedures, although they may not

internalize them. Others may hold mixed impressions of these individuals, as they may occasionally take different approaches to their work than those directed by supervisors. Driven by a mix of social interaction, entertainment, and security, these individuals seek to complete the duties of their roles and entertain themselves and others. There may be times that job responsibilities take a back seat to social demands. Others may describe these individuals as helpful and unselfish, but also somewhat mischievous.

- *Performance Implications of Below Average (6% - 25%) and Low Scores (0% - 5%).* Lower scoring individuals approach their work with a careless and inconsistent attitude, and appear more interested in socializing than in completing assigned tasks. These individuals tend to be disorganized and irresponsible in their actions, and may frequently take risky or even reckless actions in fulfilling their responsibilities. As these individuals frequently enjoy being the center of attention, they may intentionally create unnecessary drama and openly violate established organizational rules to call attention to themselves. In addition, these individuals may rebel and become insubordinate with supervisor demands. As lower scorers seek entertainment, power, social contact, and attention, they may ignore job security to meet their personal needs. Noting these tendencies, others describe these individuals as limit-testing, unconventional, rude, reckless, and immature.

6.2.2 Composure The Composure scale measures the degree to which an employee can handle stress and pressure without becoming upset or emotional. Below, we present behavioral characteristics describing individuals whose scores on this scale fall in the above average and high ranges, the average range, and the below average and low ranges.

- *Performance Implications of Above Average (76% - 95%) and High Scores (96% - 100%).* Higher scoring individuals remain calm and focused on the task at hand in stressful conditions, coping through constructive, task-focused behavior. These individuals are well-adjusted, tactful, conscientious, and goal-oriented. Emotionally stable and self-controlled, these individuals do not retreat from or lash out at others when stressed, avoiding becoming emotionally volatile, tense, cynical, or hesitant. Highly composed individuals exercise a high tolerance for stress, not acting out of impulse or anxiety. They are usually in a good mood and are not easily disappointed. They rarely get excited – even when provoked. Keeping a positive outlook, higher scorers comply with organizational

policies to solve problems. Driven by their needs to help others in social settings, these individuals pride themselves in being calm amidst crisis. Others describe these individuals as relaxed, confident, comfortable with ambiguity, and calm in tense situations.

- *Performance Implications of Average Scores (26% - 75%).* Average scoring individuals attempt to remain focused, but may occasionally retreat from or become impatient with others around them. These people cope through a mix of focusing on the problem itself and emotional withdrawal. These individuals mostly appear resilient and hard working, although their interpersonal skills may diminish when pushed. Their appearance of emotional stability and control may show cracks under stress. As a result, they may show their annoyance and become critical of others. Motivated both by helping others but also enjoying themselves and being recognized, these individuals can be difficult to work with when they are being unpredictable and critical. Others may describe these individuals as cooperative and gregarious, but occasionally fretful and tense.

- *Performance Implications of Below Average (6% - 25%) and Low Scores (0% - 5%).* Lower scoring individuals become easily frustrated and irritable under stress, making them easily upset and prone to emotional outbursts. These individuals do not handle pressure very well and may require frequent reassurance and extra attention in such situations. Being emotionally volatile, these individuals are frequently disappointed and can become skeptical or hesitant to take action. As lower scorers demonstrate a poor tolerance for stress, they may act out of impulse or simply take no action at all. Their extreme behavior and moods make them difficult as coworkers. They require a lot of attention and reassurance. Others describe these individuals as moody, quarrelsome, defensive, and temperamental.

6.2.3 Customer Focus The Customer Focus scale measures the person's capacity to relate to internal or external clients and customers in a friendly, positive, and helpful manner. Below, we present behavioral characteristics describing individuals whose scores on this scale fall in the above average and high ranges, the average range, and the below average and low ranges.

- *Performance Implications of Above Average (76% - 95%) and High Scores (96% - 100%).* Higher scoring individuals listen attentively to customer concerns and attend to them in a patient and helpful manner. These

individuals are goal-oriented, tactful, outgoing, well-adjusted, and conscientious. Being emotionally mature and confident, higher scorers are able to handle negative interactions with customers without becoming withdrawn or emotional themselves. Their internal sense of well-being allows them to work well with others without appearing irritable or annoyed. Socially engaged and tolerant of others, higher scorers do not behave in an anxious, hostile, or impulsive manner with coworkers and customers. Driven by desires to help others in social environments, these individuals seek out opportunities for service and gaining others' approval. Others describe these individuals as full of energy, cooperative, and outgoing.

- *Performance Implications of Average Scores (26% - 75%).* Average scorers attend to customer concerns, but may lack the patience and attentiveness of higher-scorers. These individuals are goal-oriented and outgoing, but allow irritations and annoyances to show. With moderate emotional maturity, average scorers are able to handle negative customer interactions most of the time. However, these people may be unable to suppress frustration when stressed, occasionally avoiding customers or providing lackluster service as a result. With a moderate sense of well-being, average scorers work well with others, but may appear tense or self-doubting during negative interactions. Driven to help others and have a good time, these individuals seek to serve others, but may have trouble persisting through difficult interactions. Others may describe these individuals as extraverted and charming, but also worrisome and inefficient.

- *Performance Implications of Below Average (6% - 25%) and Low Scores (0% - 5%).* Lower scoring individuals fail to attend to customer concerns, interacting in a manner that ranges from irritated to openly hostile. These individuals lack interpersonal skills, and are unmotivated, defensive, and careless. Emotionally inconsistent, lower scorers are unable to handle negative customer interactions without becoming withdrawn, irritable, or annoyed. Such behaviors often make it difficult for these individuals to resolve problems effectively. Socially detached and inflexible, lower scorers frequently behave in an anxious, hostile, or impulsive manner with coworkers and customers. Driven more by desires for personal pleasure than helping others, these individuals resent people and circumstances that they feel interfere with their ability to have a good time. Others describe these individuals as bitter, pessimistic, punitive, distrustful, and unpredictable.

6.3 An Interpretive Strategy The behaviors associated with the scales assessed by the Hogan Advantage emerge as fundamental characteristics either facilitating or inhibiting an individual's successful performance in entry-level jobs. The preceding section offered guidelines for interpreting a person's scores on each of the Hogan Advantage scales. Table 6.1 provides a simplified interpretive guide to the most common behavioral manifestations of high and low scale scores.

Table 6.1 Quick Guide for Interpreting the Hogan Advantage Scales

Hogan Advantage Scale	Low Scores	High Scores
Dependability	Careless, inconsistent, reckless	Organized, responsible, practical
Composure	Emotional, defensive, anxious	Calm, relaxed, confident, focused
Customer Focus	Hostile, insecure, inflexible, rude	Attentive, patient, helpful, tactful

7 – APPLICATIONS AND RECOMMENDATIONS

By conducting validity analyses for each Hogan Advantage scale, we demonstrate that each competency predicts relevant workplace behaviors. These results support the use of the Hogan Advantage to predict relevant workplace behaviors in entry-level jobs. The Hogan archive provided the source data to develop the Hogan Advantage. HIC-level data from the HPI and job performance criteria served as the basis for developing scoring algorithms for each competency. These results specified facets of personality related to competency-based entry-level performance criteria.

7.1 Simulated Adverse Impact Hogan evaluated potential selection rates for gender, age, and ethnic groups. Relevant ethnic groups vary by country. For the analyses presented below, we evaluated pass rates from a sample of 104,998 entry-level job applicants in the U.S. who reported race/ethnicity according to EEOC guidelines. Users of the Hogan Advantage should evaluate pass rate differences based on race/ethnicity in other countries as data are available.

For these analyses, which serve only as estimates of potential selection rates in lieu of actual applicant data for specific organizations, we compared individuals with "failing" or below average scores on each scale (approximately 30%) to those "passing" at both the average and above average ranges. A number of non-test factors, most notably the opportunity to take the assessment, affect selection rates. Tables 7.1 through Table 7.3 show the selection rates based upon data from an HPI archival sample by demographic group, where males, Whites, and applicants under 40 years of age serve as majority groups.

Table 7.1 Effects of Hogan Advantage *Dependability* Scale Results to the Hogan Archival Sample—Selection Rates and Adverse Impact Ratios by Demographic Group

		Fail	%	Pass	%	A.I. ratio
Total		37,131	35.4%	67,867	64.6%	NA
Sex	Men	16,606	44.1%	21,019	55.9%	NA
	Women	13,760	28.4%	34,712	71.6%	No AI
Age	< 40	11,727	39.1%	18,241	60.9%	NA
	≥ 40	2,455	29.7%	5,819	70.3%	No AI
Race	Black/African-American	2,898	33.0%	5,895	67.0%	No AI
	Hispanic/Latino	4,467	35.7%	8,039	64.3%	No AI
	Asian American/P.I.	1,786	42.5%	2,414	57.5%	No AI
	American Indian/A.N.	749	38.7%	1,185	61.3%	No AI
	White	18,491	34.6%	34,996	65.4%	NA

Note. P.I. = Pacific Islander; A.N. = Alaskan Native; No AI = No Adverse Impact, NA = Not Applicable.

Table 7.2 Effects of Hogan Advantage *Composure* Scale Results to the Hogan Archival Sample—Selection Rates and Adverse Impact Ratios by Demographic Group

		Fail	%	Pass	%	A.I. ratio
Total		30,435	29.0%	74,563	71.0%	NA
Sex	Men	10,570	28.1%	27,055	71.9%	NA
	Women	14,206	29.3%	34,266	70.7%	No AI
Age	< 40	9,431	31.5%	20,537	68.5%	NA
	≥ 40	2,369	28.6%	5,905	71.4%	No AI
Race	Black/African-American	2,295	26.1%	6,498	73.9%	No AI
	Hispanic/Latino	3,449	27.6%	9,057	72.4%	No AI
	Asian American/P.I.	1,452	34.6%	2,748	65.4%	No AI
	American Indian/A.N.	587	30.4%	1,347	69.6%	No AI
	White	15,247	28.5%	38,240	71.5%	NA

Note. P.I. = Pacific Islander; A.N. = Alaskan Native; No AI = No Adverse Impact, NA = Not Applicable.

Table 7.3 Effects of Hogan Advantage *Customer Focus* Scale Results to the Hogan Archival Sample—Selection Rates and Adverse Impact Ratios by Demographic Group

		Fail	%	Pass	%	A.I. ratio
Total		29,098	27.71%	75,900	72.29%	NA
Sex	Men	11,100	29.50%	26,525	70.50%	NA
	Women	12,247	25.27%	36,225	74.73%	No AI
Age	< 40	8,390	28.00%	21,578	72.00%	NA
	≥ 40	2,586	31.25%	5,688	68.75%	No AI
Race	Black/African-American	2,543	28.92%	6,250	71.08%	No AI
	Hispanic/Latino	3,474	27.78%	9,032	72.22%	.No AI
	Asian American/P.I.	1,598	38.05%	2,602	61.95%	No AI
	American Indian/A.N.	595	30.77%	1,339	69.23%	No AI
	White	13,450	25.15%	40,037	74.85%	NA

Note. P.I. = Pacific Islander; A.N. = Alaskan Native; No AI = No Adverse Impact, NA = Not Applicable.

Based on the 80% rule-of-thumb (or the "four-fifths rule" described in the *Uniform Guidelines*), these findings suggest that using the Hogan Advantage's entry-level competency model as a potential selection device should not result in adverse impact against any demographic group.

7.2 Uses and Applications Hogan recommends the use of the Hogan Advantage to assess the personal characteristics and individual differences of job applicants and incumbent employees in entry-level positions. By predicting performance along Hogan Advantage competencies, employers should be able to maximize the utility of their selection procedures for successful entry-level employees.

Two main applications exist for the Hogan Advantage: (a) to help companies make more informed hiring decisions concerning applicants for entry-level jobs, and (b) to help companies identify high potential entry-level employees in their incumbent workforce. With this second application in particular, organizations can use this information to inform training needs and initiatives, but should not use these scores to make personnel decisions (e.g., termination) with current incumbents.

For personnel selection, it is critical that organizations use the Hogan Advantage with all applicants within a hiring cycle to ensure standardization and fairness in the selection process. To implement the Hogan Advantage, an organization

should conduct a thorough job analysis or review existing job information to determine which competencies are critical for success in a given job. The competency scales, along with narrative information concerning candidate strengths and areas of concern, can be used to determine why a candidate might engage in behavior inconsistent with successful job performance, and thus set the stage for training and development. Nevertheless, we recommend a more extensive battery, such as the HPI, for employee development opportunities.

The Hogan Advantage consists of competency-based scoring algorithms derived from HPI scales. Assessment results from the Hogan Advantage focus *only* on predicting behavior related to the entry-level competency model. As such, high scores on the HPI do not necessarily translate to high scores on the Hogan Advantage, because the Hogan Advantage consists of only three narrowly defined constructs. Nevertheless, since the Hogan Advantage is aligned with the HPI, users should expect the same psychometric qualities in the Hogan Advantage as those that characterize the HPI – validity and reliability. These features of the Hogan Advantage will help organizations build high performing workforces.

The following procedures will help employers use and monitor performance of the Hogan Advantage effectively. First, pass rates require monitoring to determine if scoring algorithms allow enough people to pass at high levels and accurately identify other individuals more prone to receiving low job performance ratings. Assessment scales on which everyone fails are just as ineffective as those on which everyone passes. Second, employers should maintain records of scores by demographic group, as indicated by best practices, to guard against the possibility of adverse impact resulting from the use of these competency-based algorithms. Third, appropriate administrative personnel should review the entire domain of job related behaviors to determine if any procedures can be improved. This evaluation should follow approximately one year's use of the algorithms, provided sufficient data from employees or job applicants are available at that time. Finally, performance appraisal and/or monitoring data (e.g., job performance data) should be maintained, if possible, for employees who previously completed the Hogan Advantage. These data provide a check on the validity of the formulas and help determine utility. In addition, Hogan recommends conducting follow-up analyses on applicants and employees assessed using these results and exploring the utility and bottom-line impact of the assessment system. For further information, please contact:

Hogan Assessment Systems
P.O. Box 521176
Tulsa, Oklahoma 74152
(918) 749-0632

7.3 Accuracy and Completeness Hogan attests to the accuracy of the data collection, analysis, and reporting procedures used in this study. Hogan entered the data into a database and computed results using SPSS/V.12.0 statistical software.

To develop competency-based scoring algorithms, Hogan reviewed an archival research database with previously conducted criterion-related validation studies, and identified studies using job performance measures mapping to each competency. These data were used in a two-pronged developmental approach where scoring algorithms were derived using both a qualitative, theoretical approach as well as a quantitative, empirical approach. Then, Hogan combined the results of these approaches, tested alternative algorithms to finalize scoring formulas, analyzed performance of the scoring algorithms in several case studies, and reported the results of final algorithms in this report. Hogan derived results strictly from data and archived study results and did not embellish, falsify, or alter results in any manner.

8 – COMPILATION OF NORMS

8.1 Importance of Norms for Interpretation and Decision-Making Raw assessment scores hold very little information without appropriate norms to provide context for their interpretation. According to Nunnally (1967, p. 244), "norms are any scores that provide a frame of reference for interpreting the scores of particular persons." As such, norms are vital for providing meaningful context for interpreting assessment scores and subsequent decision-making. However, the *quality* of those norms is of particular importance. By using accurate and up-to-date norms, users can examine one person's scores against a suitable comparison group and, relative to those others, draw conclusions about that person's predicted future behavior.

8.1.1 Presentation of Normative Data Assessment providers use a variety of formats to present normative data. However, three formats are most prevalent: (a) raw scale scores, (b) standardized scores, or (c) percentile ranks (Nunnally, 1967). Although raw scale scores directly link to the assessment, they are difficult to interpret because different assessments and scales have differing total possible scores. For example, a raw scale score of "8" is difficult to interpret because the total possible score could be 10, 50, 100, 1,000, or any other score. Depending on the total possible score, one would interpret a raw scale score of "8" in vastly different lights.

To address the problems with interpreting raw scale scores, some assessment publishers provide norms in the form of standardized scores. Standardized scores are expressed using a mean and a standard deviation, although these vary depending on the type of standardized score used. For example, *z-scores* use a mean of 0 and standard deviation of 1. Alternatively, *T-scores* use a mean of 50 and standard deviation of 10. *Sten scores* use a mean of 5.5 and standard deviation of 2. As these examples illustrate, standardized scores transform an individual's raw scale score into a ranking metric, but these score ranges vary and, like raw scores, are not easily understood.

Unlike the two methods previously described, the HPI manual (R. Hogan & Hogan, 2007) specifies that the HPI be interpreted using percentile ranks. Percentile ranks represent an alternative to standardized scores. Like standardized scores, percentiles place an individual's raw scale score on a ranking metric where users can compare one person's scores against others' scores. However, unlike standardized scores with ranges of -3 to +3 (z-scores), 20 to 80 (T-scores), or 1 to 10 (Sten scores), percentile ranks use a 0 – 100% range, most commonly understood and easily interpreted by the general public. For example, a raw Adjustment scale score may correspond to a z-score of 1.1.

However, it is difficult to interpret this standardized score. That same scale score may correspond to a percentile score of 85%, facilitating the easy interpretation that this person scores above 85% of others on that scale. As we used HIC data from the HPI to develop scoring algorithms for Hogan Advantage competencies, we remain consistent with HPI norms, presenting Hogan Advantage competency norms in percentile ranks.

8.1.2 Professional Standards for Norm Development Cronbach (1984) noted that the norms for many personality assessments are "notoriously inadequate" and emphasized the importance of using appropriate samples when calculating norms. To provide norms, assessment providers collect data from "suitable and representative" individuals in the assessment's intended population(s). Specifically, Cronbach (1984) provided four standards for developing adequate norms, stating that they should: (a) consist of individuals for whom the assessment was intended and against whom examinees will be compared; (b) represent the referent population; (c) include a sufficient number of cases; and (d) be appropriately subdivided. Also, practical and professional considerations encourage assessment providers to establish and maintain norms. For example, Standard 4.6 of the *Standards for Educational and Psychological Testing* (AERA, APA, & NCME, 1999) states:

> *Reports of norming studies should include precise specification of the population that was sampled, sampling procedures and participation rates, any weighting of the sample, the dates of testing, and descriptive statistics. The information provided should be sufficient to enable users to judge the appropriateness of the norms for interpreting the scores of local examinees. Technical documentation should indicate the precision of the norms themselves.* (p. 55)

Considering the above discussion, Hogan developed normative data for the Hogan Advantage using an extensive normative sample based on the intended use of the assessment among the Hogan client base. As we developed the Hogan Advantage specifically for global use, the normative dataset represents multiple languages, cultures, and geographic regions. The primary concern with multi-language norms is the appropriateness of combining data derived from multiple translations. Schmit, Allik, McCrae, and Benet-Martinez (2007) summarize this issue, stating:

> *…when comparing the mean scores of different cultures on a personality trait scale, any observed differences may exist not only because of a real cultural disparity on some personality trait but also because of*

> *inappropriate translations, biased sampling, or the non-identical response styles of people from different cultures.* (p. 175)

Meyer and Foster (2008) outline three potential sources of mean score differences: (a) sample differences, (b) translation differences, and (c) cultural differences. Hogan accounts for potential sample and translation differences by (a) following rigorous guidelines when creating new translations and (b) testing for both item- and scale-level equivalence when enough data are available for a language to create a sufficiently large and representative sample. *The Development and Technical Review of Translations for the HPI, HDS, and MVPI* (Hogan Assessment Systems, 2009) outlines our procedures for developing and reviewing translations and presents results for all translations conducted to date. These results show that current translations of the HPI produce similar distributions across translations. Although no two translations are perfectly equivalent, such similarity across translations (a) demonstrates that cultural differences have little impact on score distributions, and (b) supports the use of combining data from multiple languages in the Hogan Advantage normative dataset.

When sufficient data became available, we also divided these norms by demographic variables of interest. Using percentile ranks, these normative data are easily interpretable, facilitating decision-making in applied personnel contexts. As discussed in subsequent sections of this chapter, these considerations ensure that norms provided for the Hogan Advantage adhere to existing professional guidelines and standards, such as Cronbach's (1984) guidance described above.

The remainder of this chapter describes the process of developing normative data for the Hogan Advantage, satisfying the requirements previously outlined by the *Standards for Educational and Psychological Testing* (1999).

8.2 Norm Composition Hogan uses the Hogan Advantage primarily as a selection assessment for identifying individuals who have characteristics associated with success in entry-level jobs. That is, the Hogan Advantage is most useful for those jobs where Dependability, Composure, and Customer Focus prove critical to job success. These jobs include those in administrative positions, trades and skills positions, those requiring frequent interactions with customers, and those providing protective, security, and other public services. Although the Hogan Advantage may be used to assess Dependability, Composure, and Customer Focus in the entire workforce, these four groups represent the core selection audience for the Hogan Advantage.

To develop a comprehensive sampling strategy for creating Hogan Advantage norms, we first identified stratification variables. These variables served as criteria to ensure that the Hogan Advantage norms achieve proportionate representation of respondents across these groups. Specifically, we identified (a) job families and (b) languages as key stratification variables that guided the development of the Hogan Advantage norms. We describe each of these variables in further detail below. Although not used for stratification purposes, we also examined normative data by age and gender. We did not examine normative data by race/ethnicity because of the inconsistently in racial/ethnic coding across countries.

8.2.1 Job Families Job families represent clusters of occupations grouped together based on the similarity of work performed, skills, education, training, and other credentials required for successful job performance. To classify jobs into job families, Hogan used the U.S. Department of Labor's (DoL) job categories. We chose this occupational system for two main reasons: (a) the classifications provided by the DoL are comprehensive enough to represent nearly any job around the world, and (b) the job classifications are conceptually clear and easy to use as a stratification variable. As the target population of the Hogan Advantage is entry-level jobs, Hogan included only applicants and incumbents in entry-level jobs to develop the normative sample. Table 8.1 presents norm composition by DoL Job Family.

Table 8.1 Norming Sample Distribution by DoL Job Family

DoL Job Family	Number	Percent
Computer & Mathematical Science	210	3.6
Life, Physical, & Social Science	120	2.1
Community & Social Services	948	16.4
Education, Training, & Library	145	2.5
Healthcare Practitioner & Technical	223	3.9
Protective Service	184	3.2
Food Preparation & Serving Related	191	3.3
Personal Care & Services	230	4.0
Sales & Related	1,139	19.7
Office and Administrative	912	15.8
Construction & Extraction	169	2.9
Installation, Maintenance, & Repair	124	2.1
Production	485	8.4
Transportation & Material Moving	409	7.1
Other/Unknown	296	5.1
TOTAL	**5,785**	**100.0**

8.2.2 Language Because we have translated the Hogan Advantage into over 30 languages, we included data from multiple languages when developing the normative dataset. Specifically, we included data from a language if Hogan Advantage scores were available from job applicants representing one of the job families previously described. The dataset is comprised of data from applicants assessed in 28 languages. We limited the initial dataset to 500 cases per language. When more than 500 cases of data were available for a language, we randomly selected from a pool of relevant applicants and incumbents to ensure that no language was overly represented. When fewer than 500 cases were available for a language, we included all possible cases, ensuring maximal representation for those languages. Finally, we removed cases with missing data from the final sample. Table 8.2 presents norm composition by language for all languages with at least ten cases.

Table 8.2 Norming Sample Distribution by Language

Language	Number	Percent
Brazilian Portuguese	43	0.7
Castilian Spanish	18	0.3
Czech	497	8.6
Danish	280	4.8
English (British)	444	7.7
English (American)	499	8.6
Spanish	493	8.5
French (Canadian)	121	2.1
French	154	2.7
German	199	3.4
Icelandic	34	0.6
Italian	11	0.2
Kenyan	487	8.4
Dutch	18	0.3
Norwegian	492	8.5
New Zealand	496	8.6
English (New Zealand)	25	0.4
Russian	113	2.0
Slovak	94	1.6
Swedish	494	8.5
Thai	114	2.0
Turkish	499	8.6
Other/Unknown	160	2.8
TOTAL	**5,785**	**100.0**

8.2.3 Gender and Age We also examined results by gender and age. Although not all respondents reported gender and age data, a sufficient number of respondents reported both demographic variables for us to compare score

distributions on each of the three Hogan Advantage competencies. From the Hogan Advantage normative dataset, 4,705 (81.3%) individuals reported gender and 4,646 (80.3%) reported age. Consistent with the U.S. Age Discrimination in Employment Act of 1967 (ADEA; Lindemann, Grossman, & Cane, 1996), we examined age for respondents who were under 40 years of age when they completed the assessment against respondents 40 years of age or older. Table 8.3 presents norm composition by both gender and age.

Table 8.3 Norming Sample Distribution by Gender and Age

Gender	**Number**	**Percent**
Males	2,608	55.4
Females	2,097	44.6
TOTAL	4,705	100.0
Age		
Under 40	3,586	77.2%
40 and older	1,060	22.8%
TOTAL	4,646	100.0

8.3 Stratified Sampling of the Norming Population Using the sampling plan described above, we drew representative samples from the Hogan data warehouse. We included data collected on-line between June 10, 2003 and February 19, 2009 in this initial population. We included cases from each of the job families previously described. Additionally, we included data from only job applicants to maximize representation of the intended population for the Hogan Advantage. Using as many cases of from each available language as possible, we ensured that we could eliminate cases as needed to balance across both job families and languages. This effort to maximize representation across job families and languages resulted in an initial Hogan archived population N = 12,878.

From the initial population of 12,878, we eliminated cases to achieve the sampling goals previously outlined. First, we limited the number of cases for each job family, within language, to ensure than no one job family or specific client organization was overly represented in the data. Second, we limited the number of cases per language to 500. Finally, we removed all cases with missing data. This resulted in a final sample of 5,785 cases. Tables 8.1 through 8.3 demonstrate that this final normative sample represents all job families, languages, and age and gender groups under consideration. Based on these factors, we conclude that the Hogan Advantage norms cover entry-level jobs across a broad cross-section of job families, languages, and demographic characteristics of interest.

8.4 Descriptive Statistics of the Norming Sample Table 8.4 presents means and standard deviations for the Hogan Advantage scales for the entire normative sample categorized by selected demographic groups. Appendix D presents raw score to percentile conversions for each group.

Table 8.4 Norming Sample Scale Means and Standard Deviations

Competency		**Males**	**Females**	**Under 40**	**40 and Older**	**TOTAL**
N		*2,608*	*2,097*	*3,586*	*1,060*	***5,785***
Dependability	*M*	39.02	44.56	41.30	43.64	**41.76**
	SD	13.91	14.43	14.35	14.54	**14.53**
Composure	*M*	80.11	80.38	80.03	82.97	**80.98**
	SD	16.41	16.17	16.08	15.81	**15.91**
Customer Focus	*M*	78.52	80.56	79.85	80.48	**80.05**
	SD	13.08	12.29	12.52	12.99	**12.84**

Note. M = Mean; *SD* = Standard Deviation.

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APPENDIX A: THE CET

JOB COMPETENCIES

INSTRUCTIONS

Below is a list of competencies associated with successful job performance across many jobs. Please rate the extent to which each competency **IMPROVES** job performance in the _____ job. Please evaluate every competency. Try to work quickly. Do not spend too much time thinking about any single competency.

Not Associated with Job Performance	**Minimally** Concerned with Job Performance	**Helpful** for Job Performance	**Important** for Job Performance	**Critical** for Job Performance
0	**1**	**2**	**3**	**4**

Competency	**Definition**	**Rating**
1. Stress Tolerance	Handles pressure without getting upset, moody, or anxious _____	⓪ ① ② ③ ④
2. Work Attitude	Has a positive attitude toward work _____	⓪ ① ② ③ ④
3. Achievement Orientation	Strives to meet and exceed goals for self and others _____	⓪ ① ② ③ ④
4. Initiative	Takes action before being told what to do _____	⓪ ① ② ③ ④
5. Leadership	Provides direction and motivates others to work for a common goal _____	⓪ ① ② ③ ④
6. Customer Service	Provides courteous and helpful service to customers and associates _____	⓪ ① ② ③ ④
7. Interpersonal Skills	Gets along well with others, is tactful, and behaves appropriately in social situations_____	⓪ ① ② ③ ④
8. Teamwork	Works well in groups and is a good team player _____	⓪ ① ② ③ ④
9. Integrity	Follows rules and is a good organizational citizen_____	⓪ ① ② ③ ④
10. Trustworthiness	Is honest and trustworthy _____	⓪ ① ② ③ ④
11. Detail Orientation	Performs work with great care and accuracy over a period of time_____	⓪ ① ② ③ ④
12. Safety	Follows safety precautions and displays safe on-the-job behavior _____	⓪ ① ② ③ ④
13. Planning/Organizing	Plans work to maximize efficiency (in time and resources) and minimize downtime_	⓪ ① ② ③ ④
14. Dependability	Performs work in a consistent and timely manner _____	⓪ ① ② ③ ④
15. Decision Making	Evaluates issues and uses sound reasoning to make decisions_____	⓪ ① ② ③ ④
16. Problem Solving	Identifies and implements effective solutions to problems _____	⓪ ① ② ③ ④
17. Teaching Others	Provides training for others _____	⓪ ① ② ③ ④
18. Math Skills	Uses mathematics appropriately to answer questions or solve problems ____	⓪ ① ② ③ ④
19. Job Knowledge	Understands all aspects of the job _____	⓪ ① ② ③ ④
20. Training Performance	Performs well in job training sessions or courses _____	⓪ ① ② ③ ④
21. Conflict Resolution	Resolves interpersonal problems and disputes with tact and decisiveness ___	⓪ ① ② ③ ④
22. Organizational Commitment	Shows dedication and loyalty to his/her company _____	⓪ ① ② ③ ④
23. Citizenship	Represents the company favorably to outsiders _____	⓪ ① ② ③ ④
24. Flexibility	Adapts quickly to changing circumstances and is willing to try new methods _____	⓪ ① ② ③ ④
25. Management Performance	Coordinates resources to maximize productivity and efficiency _____	⓪ ① ② ③ ④
26. Industry Knowledge	Understands the industry and its emerging trends _____	⓪ ① ② ③ ④
27. Influence	Provides effective rationale to support own opinion and ideas _____	⓪ ① ② ③ ④
28. Employee Development	Provides support and career direction to peers and subordinates _____	⓪ ① ② ③ ④

JOB COMPETENCIES (continued)

Not Associated with Job Performance	**Minimally** Concerned with Job Performance	**Helpful** for Job Performance	**Important** for Job Performance	**Critical** for Job Performance
0	**1**	**2**	**3**	**4**

Competency	**Definition**	**Rating**
29. Strategic Vision	Understands and talks about the big picture	⓪ ① ② ③ ④
30. Judgment	Uses and synthesizes information to solve problems, make evaluations, and draw sound conclusions based on subjective and/or objective criteria	⓪ ① ② ③ ④
31. Oral Communication	Conveys information clearly and expresses self well in conversations	⓪ ① ② ③ ④
32. Written Communication	Writes clearly and concisely	⓪ ① ② ③ ④
33. Technical Knowledge	Uses existing technology and considers the use of new technology to increase productivity	⓪ ① ② ③ ④
34. Adaptability	Is able to change directions quickly and work without explicit guidance	⓪ ① ② ③ ④
35. Delegation	Assigns work to others based on their skills and future development needs	⓪ ① ② ③ ④
36. Negotiation	Explores alternatives to reach outcomes acceptable to all parties	⓪ ① ② ③ ④
37. Impact	Creates a good first impression and commands attention and respect	⓪ ① ② ③ ④
38. Information Monitoring	Sets up procedures to collect information needed to manage activities	⓪ ① ② ③ ④
39. Building Strategic Work Relationships	Develops collaborative relationships to facilitate the accomplishment of work goals	⓪ ① ② ③ ④
40. Innovation	Finds innovative solutions to problems at work	⓪ ① ② ③ ④
41. Gaining Commitment	Uses appropriate methods to gain acceptance of ideas or plans	⓪ ① ② ③ ④
42. Facilitating Change	Encourages others to find or adopt innovative solutions	⓪ ① ② ③ ④
43. Risk Taking	Takes chances to achieve goals while considering possible negative consequences	⓪ ① ② ③ ④
44. Verbal Direction	Listens to and follows verbal directions from others	⓪ ① ② ③ ④
45. Data Entry	Ensures high quality data entry by balancing the needs for speed and accuracy	⓪ ① ② ③ ④
46. Vigilance	Remains watchful and alert while performing monotonous tasks	⓪ ① ② ③ ④
47. Consultative Sales	Develops understanding of client history and goals in order to offer needed services	⓪ ① ② ③ ④
48. Facilitative Sales	Uses detailed product knowledge to facilitate the sale of products and services	⓪ ① ② ③ ④
49. Building Partnerships	Builds strategic relationships to help achieve business goals	⓪ ① ② ③ ④
50. Building Teams	Uses appropriate methods to build a cohesive team	⓪ ① ② ③ ④
51. Formal Presentation	Presents ideas effectively to individuals or groups	⓪ ① ② ③ ④
52. Sales Ability	Uses appropriate interpersonal styles and communication methods to sell products or services	⓪ ① ② ③ ④
53. Continuous Learning	Actively identifies new areas for personal learning	⓪ ① ② ③ ④
54. Follow-Up	Monitors the results of work assigned to others	⓪ ① ② ③ ④
55. Meeting Participation	Is an active participant during meetings	⓪ ① ② ③ ④
56. Meeting Leadership	Ensures that meetings accomplish their business objectives	⓪ ① ② ③ ④

APPENDIX B: SAMPLE HOGAN ADVANTAGE REPORT

SELECT
DEVELOP
LEAD

HOGANSELECT

ADVANTAGE

AN OFF-THE-SHELF SOLUTION FOR CANDIDATE SELECTION

Report for: John Sample
ID: DC178490
Date: May 20, 2009

POWERED BY HOGAN

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HOGAN *SELECT* ADVANTAGE

The three scales of the Hogan Advantage Report are defined as follows:

DEPENDABILITY	This scale concerns the degree to which a person will follow established rules and procedures, make work and work-related activity a priority, accept supervision, and follow through on assigned tasks and responsibilities. Persons with high scores tend to be hard-working and reliable. Persons with low scores are more likely to be careless, uneven in their job performance, and potentially rebellious or insubordinate.
COMPOSURE	This scale concerns the degree to which an employee can handle stress and pressure without becoming upset or emotional. Persons with high scores remain calm, relaxed, and focused on the job even under pressure. They are usually in a good mood. Persons with low scores are more likely to become visibly upset. They are easily frustrated, nervous, and irritable, requiring extra attention and reassurance.
CUSTOMER FOCUS	This scale concerns a person's capacity to relate to clients or customers in a friendly, positive, and helpful manner. Persons with high scores will listen effectively to customers' questions or problems and will be polite, patient, attentive, and helpful. Persons with low scores are more likely to be irritable, abrupt, or even rude in responding to customers' concerns, often making it difficult to resolve the problem effectively.

DEPENDABILITY

LOW | BELOW AVERAGE | AVERAGE | ABOVE AVERAGE | HIGH

93

- What are you likely to do when faced with a rule at work that makes no sense?
- Tell me about the last time you got in trouble at work.

COMPOSURE

LOW | BELOW AVERAGE | AVERAGE | ABOVE AVERAGE | HIGH

82

- What things annoy you the most at work?
- Have you ever experienced an emergency at work? Tell me about it.

CUSTOMER FOCUS

LOW | BELOW AVERAGE | AVERAGE | ABOVE AVERAGE | HIGH

73

- Tell me about the last time you became annoyed with a customer.
- Would you say that you are easy to do business with?

THIS CANDIDATE'S OVERALL EMPLOYABILITY SCORE IS	**86%**

The results contained in this report are NOT meant to supersede the judgment of a hiring manager. Rather, a hiring manager should use these results as one input into his/her process for arriving at a hiring decision regarding the candidate.

ID:DC178490 John Sample 5.20.2009 2

APPENDIX C: CALIFORNIA Q-SET (CQS) PHRASE CORRELATIONS

Hogan Advantage Correlations with California Q-Set (CQS) Descriptive Phrases

CQS Phrase	Dependability	Composure	Customer Focus
Is critical, skeptical, not easily impressed.	-.35	-.12	-.18
Is a genuinely dependable and responsible person.	-.02	.16	.17
Has a wide range of interests.	-.14	.04	.16
Is a talkative individual.	-.08	.01	.24
Behaves in a giving way toward others.	.17	-.05	.14
Is fastidious. (Meticulous attention to detail)	.01	-.14	-.08
Favors conservative values in a variety of areas.	.05	.03	-.02
Appears to have a high degree of intellectual capacity.	-.05	.02	.14
Is comfortable with uncertainty and complexity.	-.13	.30	.26
Anxiety and tension find outlet in bodily symptoms.	.01	-.30	-.11
Is protective of those close to him or her.	.23	-.10	.07
Tends to be self-defensive.	-.14	-.30	-.08
Is thin-skinned; sensitive to anything that can be construed as criticism or an interpersonal slight.	.12	-.38	-.15
Genuinely submissive; accepts domination comfortable.	.30	.16	.16
Is skilled in social techniques of imaginative play, pretending and humor.	-.04	.05	.09
Is introspective and concerned with self as an object.	.03	-.06	.01
Behaves in a sympathetic or considerate manner.	.21	.08	.21
Initiates humor.	-.16	-.09	.10
Seeks reassurance from others.	.00	-.21	.08
Has a rapid personal tempo; behaves and acts quickly.	.01	.01	.05
Arouses nurturant feelings in others.	.18	.12	.26
Feels a lack of personal meaning in life.	.04	-.17	-.24
Extra-punitive; tends to transfer or project blame.	-.13	-.24	-.30
Prides self on being "objective," rational.	-.11	.14	.03
Tends toward over-control of needs and impulses; binds tensions excessively; delays gratification unnecessarily.	-.24	-.08	-.20
Is productive; gets things done.	-.16	.02	.10
Shows condescending behavior in relations with others.	-.05	-.18	-.22
Tends to arouse liking and acceptance in people.	.07	.09	.31
Is turned to for advice and reassurance.	.17	.07	.16

Hogan Advantage Correlations with California Q-Set (CQS) Descriptive Phrases (Continued)

CQS Phrase	Dependability	Composure	Customer Focus
Gives up and withdraws where possible in the face of frustration and adversity.	.02	-.08	-.05
Regards self as physically attractive.	.05	.18	.41
Seems to be aware of the impression he or she makes on others.	.16	.05	.12
Is calm, relaxed in manner.	.13	.35	.14
Over-reactive to minor frustrations; irritable.	-.03	-.26	-.22
Has warmth; has the capacity for close relationships; compassionate.	.07	.16	.28
Is subtle negativistic; tends to undermine and obstruct or sabotage.	-.05	-.10	-.16
Is guileful and deceitful, manipulative, opportunistic.	-.15	-.09	-.06
Has hostility towards others.	-.08	-.22	-.27
Thinks and associates to ideas in unusual ways; has unconventional thought processes.	-.27	-.04	-.18
Is vulnerable to real or fancied threat, generally fearful.	.21	-.26	-.16
Is moralistic.	.04	.11	.11
Reluctant to commit self to any definite course of action; tends to delay or avoid action.	-.01	-.16	-.19
Is facially and/or gesturally expressive.	.05	-.09	.14
Evaluates the motivation of others in interpreting situations.	-.06	.06	.02
Has a brittle ego-defense system; has a small reserve of integration; would be disorganized and maladaptive when under stress or trauma.	.06	-.24	-.17
Engages in personal fantasy and daydreams, fictional speculations.	-.08	.20	.09
Has a readiness to feel guilty.	.16	-.17	-.08
Keeps people at a distance; avoids close interpersonal relationships.	.08	-.13	-.26
Is basically distrustful of people in general; questions their motivations.	.05	-.22	-.35
Is unpredictable and changeable in behavior and attitudes.	-.22	-.21	-.29
Genuinely values intellectual and cognitive matters.	-.01	.06	.06
Behaves in an assertive fashion.	.04	-.11	-.04
Various needs tend toward relatively direct and uncontrolled expression; unable to delay gratification.	-.11	.06	-.04
Emphasizes being with others; gregarious.	-.10	.27	.45
Is self-defeating.	-.04	-.23	-.25
Responds to humor.	-.04	.05	.21
Is an interesting, arresting person.	.13	-.01	.18
Is experience seeking.	-.22	.08	.13

Hogan Advantage Correlations with California Q-Set (CQS) Descriptive Phrases (Continued)

CQS Phrase	Dependability	Composure	Customer Focus
Is concerned with own body and the adequacy of its physiological functioning.	-.02	.21	.21
Has insight into own motives and behavior.	-.01	.08	.13
Creates and exploits dependency in people.	-.03	-.06	.04
Tends to be rebellious and non-conforming.	-.19	-.25	-.24
Judges self and others in conventional terms like "popularity," "the correct thing to do," social pressures, etc.	-.04	.27	.14
Is socially perceptive of a wide range of interpersonal cues.	-.02	.15	.19
Characteristically pushes and tries to stretch limits; sees what he or she can get away with.	-.41	-.03	-.11
Enjoys esthetic impressions; is esthetically reactive.	.02	.21	.22
Is self-indulgent.	-.06	.04	.00
Is basically anxious.	.07	-.36	-.15
Is sensitive to anything that can be construed as a demand.	-.02	-.43	-.07
Behaves in an ethically consistent manner; is consistent with own personal standards.	.08	.07	.16
Has high aspiration level for self.	-.03	.20	.27
Concerned with own adequacy as a person, either at conscious or unconscious levels.	.06	-.07	.09
Tends to perceive many different contexts inappropriately.	-.13	-.13	-.18
Is subjective unaware of self-concern; feels satisfied with self.	-.09	.13	.12
Has a clear-cut, internally consistent personality.	-.15	.28	.25
Tends to project his or her own feelings and motivations onto others.	-.10	.02	.12
Appears straightforward, forthright, and candid in dealing with others.	-.04	.10	.18
Feels cheated and victimized by life; self-pitying.	-.19	-.20	-.18
Tends to ruminate and have persistent pre-occupying thoughts.	-.02	-.11	-.03
Interested in establishing relationships.	.10	.04	.31
Is physically attractive; good looking.	.18	.08	.29
Has fluctuating moods.	-.04	-.36	-.28
Able to see to the heart of important problems.	-.01	.10	.13
Is cheerful.	.03	.08	.39
Emphasizes communication through action and non-verbal behavior.	.02	.12	.09
Handles anxiety and conflicts by refusing to recognize their presence; repressive or dissociative tendencies.	-.14	-.11	-.15

Hogan Advantage Correlations with California Q-Set (CQS) Descriptive Phrases (Continued)

CQS Phrase	Dependability	Composure	Customer Focus
Interprets basically simple and clear-cut situations in complicated and particularizing ways.	.01	-.09	-.10
Is personally charming.	.18	.11	.39
Compares self to others. Is alert to real or fancied differences between self and other people.	.13	.05	.25
Is concerned with philosophical problems; e.g., religious, values, the meaning of life, etc.	-.02	.03	.00
Is power oriented; values power in self or others.	-.11	-.02	.05
Has social poise and presence; appears socially at ease.	.05	.16	.14
Expresses hostile feelings directly.	.01	-.12	-.22
Behaves in a masculine style and manner OR Behaves in feminine style and manner	.01	-.13	.06
Tends to pro-offer advice.	-.16	.16	.05
Values own independence and autonomy.	-.32	.15	.13
Is emotionally bland; has flattened affect.	.05	-.13	-.31
Is verbally fluent; can express ideas well.	-.19	.11	-.09
Is self-dramatizing; histrionic.	-.21	.18	.08
Does not vary roles; relates to everyone in the same way.	.17	.04	-.01

Note. N = 84; Correlations ≥ .22 are significant at $\rho < .05$ (two-tailed).

APPENDIX D: NORMS FOR THE TOTAL SAMPLE

Scores	Total Sample N = 5,785			Males N = 2,608			Females N = 2,097			Under 40 N = 3,586			40 and Older N = 1,060		
Raw	DEP Norms	COM Norms	CUS Norms	DEP Norms	COM Norms	CUS Norms	DEP Norms	COM Norms	CUS Norms	DEP Norms	COM Norms	CUS Norms	DEP Norms	COM Norms	CUS Norms
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	1	0	0	1	0	0	0	0	0	1	0	0	0	0	0
10	2	0	0	2	0	0	1	0	0	2	0	0	1	0	0
15	4	0	0	5	0	0	2	0	0	4	0	0	2	0	0
20	8	0	0	11	0	0	5	1	0	8	0	0	6	0	0
25	14	1	0	18	1	0	10	1	0	15	1	0	11	1	0
30	25	1	0	31	1	0	19	1	0	26	1	0	20	1	0
35	37	2	0	44	2	0	30	2	0	38	2	0	33	2	0
40	50	3	1	58	3	1	41	3	0	51	3	1	46	2	1
45	63	4	1	70	4	2	54	4	1	64	4	1	58	4	2
50	74	6	2	80	6	3	67	6	2	75	6	2	69	5	3
55	83	8	4	88	9	5	77	9	4	84	9	3	80	7	5
60	90	11	7	93	13	9	86	12	6	90	13	7	87	9	8
65	94	16	13	96	18	16	92	16	11	95	17	13	92	13	13
70	97	21	23	98	24	27	96	22	21	97	23	23	96	18	21
75	99	29	35	99	31	39	98	29	34	99	31	35	98	25	32
80	99	39	47	100	42	51	99	41	45	100	41	48	99	36	44
85	100	55	61	100	57	65	100	56	61	100	57	63	100	49	58
90	100	71	76	100	73	80	100	72	74	100	74	77	100	65	74
95	100	88	92	100	89	94	100	89	93	100	90	93	100	83	92
100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100

Note. Due to the total possible number of raw scores, percentile scores are presented in 5-raw point increments; DEP = Dependability; COM = Composure; CUS = Customer Focus.

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