

Validity of the Hogan Personality Inventory and the Motives, Values, Preferences Inventory for Selecting Sales Representatives at ABC Company

Documentation of Evidence for
Job Analysis, Validity Generalization, and
Criterion-Related Validity

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THE SCIENCE OF PERSONALITY

EXECUTIVE SUMMARY

This report summarizes the research procedures Hogan used to establish the validity of the Hogan Personality Inventory (HPI) and the Motives, Values, Preferences Inventory (MVPI) for selecting employees into the Sales Representative job at ABC Company. This report details the methods used to (a) identify the job's key requirements, (b) accumulate validity evidence, and (c) select scales to predict performance in the Sales Representative job.

The research study began with a personality-based job analysis to collect data from individuals familiar with the job requirements. Hogan collected information from focus groups, job descriptions, and Hogan's job evaluation tool (JET). Hogan aligned this information with predictor scales on the HPI and MVPI.

Hogan used multiple techniques to accumulate validity evidence. First, Hogan identified historically valid predictors of job performance using a job family meta-analysis approach. Next, Hogan identified valid predictors of key job elements using a synthetic/job component validation approach. Finally, Hogan established criterion-referenced validity evidence by classifying incumbent Sales Representatives based on (a) subjective measures of their performance and (b) their HPI results.

Hogan's validation findings support the predictive validity of the HPI Adjustment, Prudence, and Learning Approach scales. Hogan recommends using these scales as the basis for the Moderate Fit candidate screening guidelines, which identify candidates who possess at least a minimal degree of the personal characteristics associated with successful Sales Representative performance. Analyses using a simulated applicant pool indicate that the recommended Moderate Fit cutoff scores should result in no adverse impact. Hogan also recommends High Fit candidate-screening guidelines comprised of more stringent HPI requirements with the addition of a minimum scoring requirement on the HPI Inquisitive scale and the MVPI Commerce and Science scales.

Hogan recommends the completion of a local validation study and accumulation of business utility data (when feasible) to evaluate the effectiveness of Sales Representative assessment results at ABC Company. Until sufficient company-specific assessment and performance data are available, we recommend that ABC Company use these results in conjunction with other applicant information to drive selection decisions.

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1 - INTRODUCTION

1.1 Foundation. This report provides a technical summary of research conducted to evaluate the validity of the Hogan Personality Inventory (R. Hogan & J. Hogan, 2007; hereafter “HPI”) and the Motives, Values, Preferences Inventory (J. Hogan & R. Hogan, 1996; hereafter “MVPI”) at ABC Company Sensor Systems (ABC Company). ABC Company sought to use these assessments to predict performance in the Sales Representative job. The research conforms to standards outlined in the *Uniform Guidelines on Employee Selection Procedures* (Equal Employment Opportunity Commission, 1978; hereafter “*Uniform Guidelines*”), *The Principles for the Validation and Use of Personnel Selection Procedures* (Society for Industrial and Organizational Psychology, 2003; hereafter “*Principles*”), and the *Standards for Educational and Psychological Testing* (American Educational Research Association, 1999; hereafter “*Standards*”). In areas where the *Uniform Guidelines*, *Principles* and/or *Standards* proved vague or inapplicable, the research approach relied on the broader scientific/professional literature for guidance.

1.2 Overview. We organized this document in the following sections:

- *Introduction* – project overview
- *Description of Selection Procedures* – review of predictors
- *Job Analysis* – review of job requirements
- *Meta-Analysis Results for Evaluating Validity Generalization of Personality Measures* – review of meta-analysis literature
- *Transportability of Validity* – research on similar jobs
- *Synthetic/Job Component Validity* – research on jobs with similar components
- *Criterion Related Validity* – research on matching predictors and criterion
- *Recommendations* – application recommendations

1.3 User, Location(s), and Dates of Study. ABC Company is a leading supplier of RF, microwave, and millimeter wave products for the defense and space industry. ABC Company is headquartered in San Diego, CA and has state-of-the-art engineering and manufacturing facilities throughout the country.

Hogan conducted research described in this report between November 2008 and May 2009. The job analysis process relied on input collected from Subject Matter Experts (hereafter SMEs) – individuals highly familiar with the target job(s) and how they should *ideally* be performed. SMEs included supervisors, managers, and experienced Sales Representatives.

1.4 Problem and Setting. ABC Company’s selection process is critical for identifying talented employees who will contribute to the long-term success of the company. The complexities of recruiting and the dynamic job market warrant continuous evaluation and improvement of ABC Company’s selection process.

A review of alternative candidate selection techniques prompted ABC Company to conclude that an assessment of personality characteristics could enhance the current procedures used to screen and select candidates into Sales Representative jobs.

ABC Company contacted Hogan and initiated research to evaluate the validity of the HPI and MVPI for predicting Sales Representative job performance. If the inventory scales demonstrated validity, ABC Company planned to use the assessments to screen Sales Representative applicants.

2 - DESCRIPTION OF SELECTION PROCEDURES

2.1 Approach and Rationale. Validating selection instruments relies on accurate measurement. In accordance with Ghiselli, Campbell, and Zedeck (1981), we define measurement as any procedure that assigns numbers systematically to characteristic features of people according to explicit rules. Researchers and practitioners can use these numbers to make predictions or forecast future behavior(s).

Assigning numbers in a systematic fashion to characteristics is a critical, but not a wholly sufficient, requirement of any pre-employment selection tool. Every selection tool should also provide evidence to support (a) the reliability of the instrument and (b) the relations between scores on the instrument and job-relevant behaviors or outcomes (Equal Employment Opportunity Commission, 1978). At a minimum, the reliability of pre-employment assessments should be evaluated 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).

The ability of a pre-employment instrument to predict job-relevant behaviors or outcomes should be documented in credible scientific sources. The supporting evidence should include significant and interpretable relations between scores on the pre-employment instrument and indices of job performance. Moreover, evidence should also demonstrate that scores on the pre-employment instrument predict job performance criteria critical to success in the job of interest.

Pre-employment instruments should be fair assessments, in that they should not discriminate unfairly on the basis of gender, age, or race/ethnicity (Equal Employment Opportunity Commission, 1978). Researchers must validate selection procedures that result in adverse impact in accordance with the *Uniform Guidelines*. Unfortunately, many instruments currently used in pre-employment screening processes fail to meet the criteria outlined above (R. Hogan, J. Hogan, & Trickey, 1999).

2.2 What to Measure and Why. Based on ABC Company desire to evaluate the validity of personality inventories for assisting in the Sales Representative selection process, the following summary briefly describes measurement issues that have influenced the current effort. The most important question in personality assessment is “*What should we measure?*” Historically, the answer depended on an 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 can be described in terms of five 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; HPI: R. Hogan & J. Hogan, 1995, 2007; Personal Characteristics Inventory: Mount & Barrick, 2001). 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 can be described, with little difficulty, in terms of these five dimensions (Wiggins & Pincus, 1992). Consequently, the FFM is the paradigm for current research in personality assessment (De Raad & Perugini, 2002; R. Hogan & J. Hogan, 1995, 2007).

Observer's descriptions of others serve as the foundation of the FFM. These descriptions form the basis of one's reputation – i.e., 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 to establish, defend, or enhance that person's identity – i.e., a person's view of him or herself (cf. Goffman, 1958). Reputations are public, tell us about observable tendencies in the others' behaviors, can be measured reliably, and can be used to forecast future behavior (cf. Emler, 1990). A person's reputation represents an invaluable source of information about work-related strengths and shortcomings and influences the direction of careers.

Personality assessment samples self-presentational behavior – i.e., how a person portrays him or herself to others on the job. An assessment instrument allows us to aggregate these behavioral samples, assign them numbers according to certain agreed-upon rules, and then use these numbers or scores to make predictions about a person's future behavior. Research shows that personality is predictive of both work and non-work related outcomes, such as job performance, leadership, health related behaviors, life satisfaction, and job satisfaction (Hough & Oswald, 2008; Ozer & Benet-Martinez, 2005; Roberts, Kuncel, Shiner, Caspi, & Goldberg, 2007).

2.3 The Hogan Personality Inventory. The HPI was the first measure of normal personality based on the FFM and designed to predict occupational performance. 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 is considered a marker instrument, not only in English, but for personality measures in other languages as well. 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 & J. 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 & J. Hogan, 2007). Factor I = 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

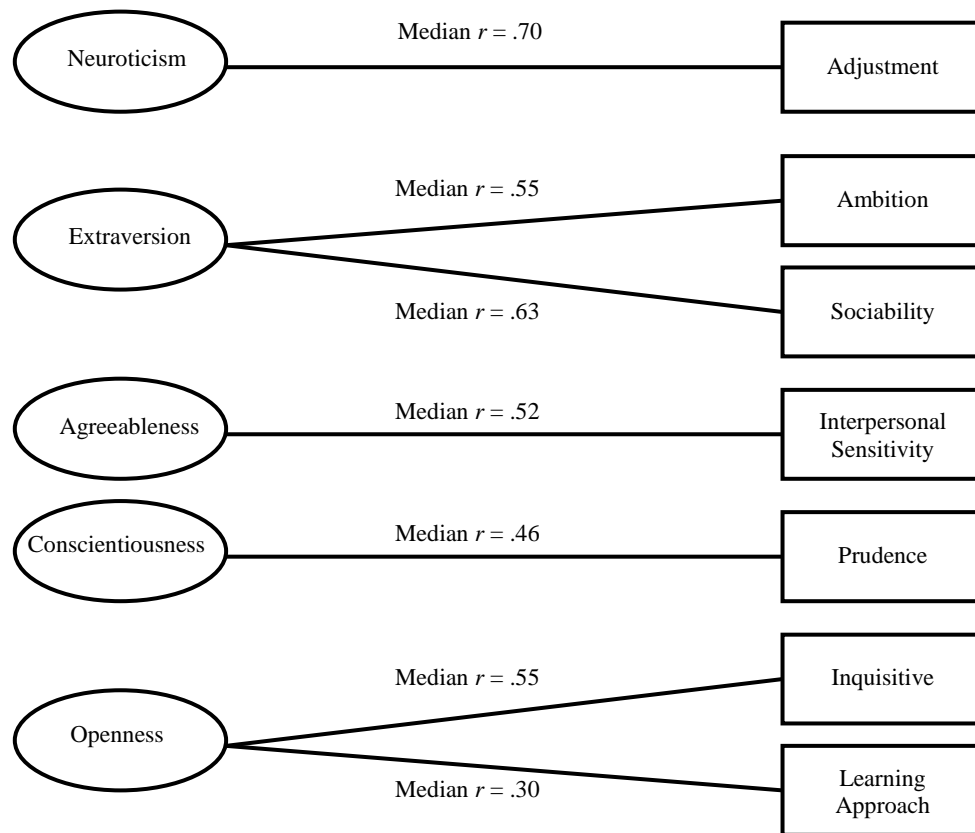
Scale	ADJ	AMB	SOC	INP	PRU	INQ	LRN
Extraversion	.16*	.54*	.63*	.44*	-.06	.22*	.08*
Agreeableness	.31*	-.12*	-.24*	.47*	.46*	-.20*	-.08*
Conscientiousness	.24*	.37*	-.05	.08	.42*	.05	.16*

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

Scale	ADJ	AMB	SOC	INP	PRU	INQ	LRN
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 & J. 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.

2.4 Hogan Personality Inventory Description and Development.

HPI Description

- 206 true/false items with no psychiatric content.
- 7 personality scales, 1 validity scale, no item overlap.
- 4th grade reading level.
- 15-20 minute completion time.
- Items carefully screened to minimize invasion of privacy.
- Designed for ages 18 and above.
- Internet administration and reporting.

HPI Development

- Development began in the late 1970's, based on the FFM, and constructed and validated in accordance with professional standards and the *Uniform Guidelines*. Favorable reviews of the HPI appear in the Buros Institute of Mental Measurements' *The Thirteenth Mental Measurements Yearbook* (Lobello, 1998) and the British Psychological Society's Psychological Testing Centre's "Test Reviews" (Creed & Shackleton, 2007).
- Norms are based on 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 sample is representative of 14 of the 23 US Department of Labor categories.
- The HPI has been used in over 450 validation studies to predict occupational performance across a range of jobs and industries. Jobs studied represent 95% of the industry coverage of the *Dictionary of Occupational Titles* (US Department of Labor, 1991).
- Meta-analyses of HPI scales indicate that the estimated true validities for the HPI scales 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 by race/ethnicity, gender, or age.

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

Constructs Measured

The HPI scales (and associated FFM constructs measured) are defined as follows:

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

Ambition concerns the degree to which a person seems leaderlike, status-seeking, and achievement-oriented (FFM: Extraversion).

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

Interpersonal Sensitivity concerns the degree to which a person has social sensitivity, tact, and perceptiveness (FFM: Agreeableness).

Prudence concerns the degree to which a person seems conforming, dependable and has self-control (FFM: Conscientiousness).

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

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

In terms of instrument development, an initial pool of 425 items was refined using factor analysis and empirical validation procedures to assign 206 items to seven construct scales. The items form small composites (i.e., facets) that represent themes within the larger constructs. The number of composites per scale ranges from four (Learning Approach) to eight (Adjustment). Overall, HPI scales demonstrate adequate psychometric qualities (Lobello, 1998). Hogan retained items in the final battery based on their demonstrated ability to predict significant non-test behavior. There is no item overlap among 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. The HPI is a well-validated instrument that

predicts job performance across occupations and organizations (Axford, 1998; J. Hogan & Holland, 2003).

2.5 The Motives, Values, Preferences Inventory. The MVPI (J. Hogan & R. Hogan, 1996) serves two distinct purposes. First, it allows for an evaluation of fit between an individual and an organization, an important index given that greater similarity between individual and organizational values facilitates successful person-organization fit. Person-organization fit is important because, no matter how talented and hard working a person may be, if the individual's values are incompatible with those of the larger culture, then he or she will not be as effective as his or her talent might predict. Second, the MVPI is a direct reflection of those areas that serve as motivators for an individual. Such information can be beneficial in a variety of organizational functions (e.g., placing individuals, building teams, designing reward systems, etc.). The MVPI is an untimed, 200-item, self-report measure that contains ten primary scales (twenty items per scale). The MVPI is organization-specific as a predictor of performance (J. Hogan & R. Hogan, 1996). The scales demonstrate adequate psychometric qualities with internal-consistency reliability coefficients ranging between .70 (Security) to .84 (Aesthetics), and test-retest reliability coefficients (assessed over an eight week period) ranging from .69 (Power) to .88 (Recognition).

2.6 Motives, Values, Preferences Inventory Description and Development.

MVPI Description

- 200 agree/uncertain/disagree items that have no psychiatric or mental health content.
- 10 primary scales, 5 themes, no item overlap between scales.
- 3rd grade reading level.
- 15-20 minute completion time.
- Items are not interpretable in medical, disability, or psychiatric terms.
- Designed for ages 18 and above.
- Internet administration and reporting.

MVPI Development

- Data from 3,015 working adults and job applicants from a variety of organizations make up the MVPI norms. These data include supervisory and non-supervisory personnel. Descriptive statistics for MVPI scales appear by gender, age, and race/ethnicity in the *Motives, Values, Preferences Inventory Manual* (J. Hogan & R. Hogan, 1996).
- Favorable reviews of the MVPI appear in the *Buros Institute of Mental Measurements' The Fourteenth Mental Measurements Yearbook* (Roberts, 2001)
- Researchers have used the MVPI in over 20 criterion-related validation studies to predict occupational performance across a range of jobs and industries (e.g., Shin & Holland, 2004).
- To date in decision-making applications, we have found no adverse impact with the MVPI.
- The MVPI manual documents the development and psychometric properties in further detail (J. Hogan & R. Hogan, 1996). Construct validity evidence is reported in the MVPI manual; scale correlates with non-test behavior and observer ratings appear in J. Hogan and R. Hogan (1996).

The MVPI scales are defined as follows:

Aesthetics concerns valuing creative and artistic self-expression.

Affiliation concerns valuing frequent and varied social interaction.

Altruistic concerns valuing actively helping others and improving society.

Commerce concerns valuing business activities, money, and financial gain.

Hedonism concerns valuing fun, good company, and good times.

Power concerns valuing competition, achievement, and being influential.

Recognition concerns valuing fame, visibility, and publicity.

Science concerns valuing ideas, technology, and rational problem solving.

Security concerns valuing certainty, predictability, and risk free environments.

Tradition concerns valuing history, rituals, and old-fashioned virtues.

In terms of instrument development, the MVPI is comprised of items derived rationally from hypotheses about the likes, dislikes, and aversions of the “ideal” exemplar of each motive. Each scale is composed of five themes: (a) Lifestyles, which concern the manner in which a person would like to live; (b) Beliefs, which involve “shoulds”, ideals, and ultimate life goals; (c) Occupational Preferences, which include the work an individual would like to do, what constitutes a good job, and preferred work materials; (d) Aversions, which reflect attitudes and behaviors that are either disliked or distressing; and (e) Preferred Associates, which include the kind of persons desired as coworkers and friends. There are no correct or incorrect responses for the MVPI scales; therefore, there is no need for validity or faking keys. There is no item overlap among the 10 scales.



3 – JOB ANALYSIS

The *Uniform Guidelines* emphasizes the importance of conducting a complete job analysis for all content and construct validation studies. The guidelines require documentation of (a) work behaviors and/or outcomes, (b) the criticality of work behaviors or outcomes, and if applicable (c) the supporting evidence and rationale for grouping together two or more jobs [Section 15, B, (3)]. The remainder of this section describes the collaborative steps taken by Hogan and ABC Company to comply with these technical guidelines.

3.1 Job Description. Hogan experts' content review of the job description revealed that Sales Representatives are responsible for electrical design, manufacturing, and production. Specifically, Sales Representatives tune, optimize, and prototype RF/Microwave circuits. (see Appendix A for a complete Sales Representative job description).

A review of the Sales Representative job description provided the basis for determining (a) the degree to which personal characteristics are important for the job, (b) the Department of Labor (DOL) and Occupational Information Network (O*NET, <http://online.onetcenter.org>) job codes, and (c) the degree to which the job is similar to other jobs in the Hogan archive for which prior validation research has been conducted. Hogan's expert review revealed that personal characteristics make up a significant proportion of the important characteristics of Sales Representatives, which provides support for using a personality-based job analysis method. DOL and O*NET codes that were identified for the job are 17-3023 and 17-3023.01, respectively.

3.2 Job Analysis Survey. Hogan designed a standardized on-line job analysis survey to identify the critical worker-oriented requirements of Sales Representatives in terms of the key personal requirements and critical competencies required for effective performance. The Job Evaluation Tool ("JET") consists of three components: (a) the Performance Improvement Characteristics (PIC) survey, (b) the Motivational Improvement Characteristics (MIC) survey, and (c) the Competency Evaluation Tool (CET). A copy of the JET appears in Appendix B.

3.3 Performance Improvement Characteristics. The PIC job analysis identifies (a) the personal characteristics needed to successfully execute the requirements of a job and (b) the degree to which possession of these personal characteristics improves job performance (Foster, Gaddis, & J. Hogan, 2009; J. Hogan & Rybicki,

1998). SMEs rated the PIC items using a scale ranging from “0” (*Does Not Improve Performance*) to “3” (*Substantially Improves Performance*).

The PIC is not intended for use in pre-employment decision-making. It is a job analysis tool designed solely to help identify the personal characteristics that are critical for success in a given job. Regardless, job analysis tools such as the PIC should provide documentation supporting the reliability and accuracy of scores. Results reported in the manual indicate that PIC scales’ internal consistency reliability estimates range between .76 (Adjustment) and .87 (Interpersonal Sensitivity); average internal consistency is .83. Test-retest reliability estimates based on at least a 1-month interval, range between .60 (Learning Approach) and .84 (Inquisitive); the average test-retest reliability is .71. Research indicates that the PIC differentiates between jobs, and scores on the PIC scales correspond to scales on the Hogan Personality Inventory (HPI; R. Hogan & J. Hogan, 1995, 2007) that predict successful job performance (Foster et al., 2009; Meyer & Foster, 2007; Rybicki, 1997).

The 48 PIC items align conceptually and empirically with the Five-Factor Model and the HPI (refer to Table 3.1). Hogan computes scale scores on the PIC by (a) summing the item responses that correspond to each of the seven scales, (b) averaging the scores for each scale across raters, and (c) converting the average scale scores to a percentage of total possible points. The resulting percentile scores illustrate the characteristics the SME panel judged important for the job under evaluation.

Table 3.1 HPI and PIC Scale Definitions

Scale Name	Definition
	<i>The degree to which a person seems....</i>
Adjustment	calm and self-accepting
Ambition	self-confident and competitive
Sociability	to need or enjoy social interaction
Interpersonal Sensitivity	perceptive, tactful, and sensitive
Prudence	conscientious and conforming
Inquisitive	creative and interested in problems
Learning Approach	concerned with building job related knowledge

Because PIC scores are used to identify personal characteristics important for success in a job, it is essential that scores on the PIC identify HPI scales that are predictive of job performance. Meyer, Foster, and Anderson (2006) evaluated the validity of the PIC using multiple samples from the Hogan archive. They found

that HPI profiles created using PIC results were more effective at predicting performance for target jobs than for other jobs. This research indicates that the PIC differentiates between jobs, and scores on PIC scales identify the HPI scales that predict job performance.

Providing validation results for a job analysis technique surpasses the guidelines and requirements described in either the *Uniform Guidelines* or *Principles*. In fact, the scientific literature contains virtually no discussion concerning empirical validation of a job analysis tool. A copy of the PIC appears as the Job Characteristics section of the JET in Appendix B.

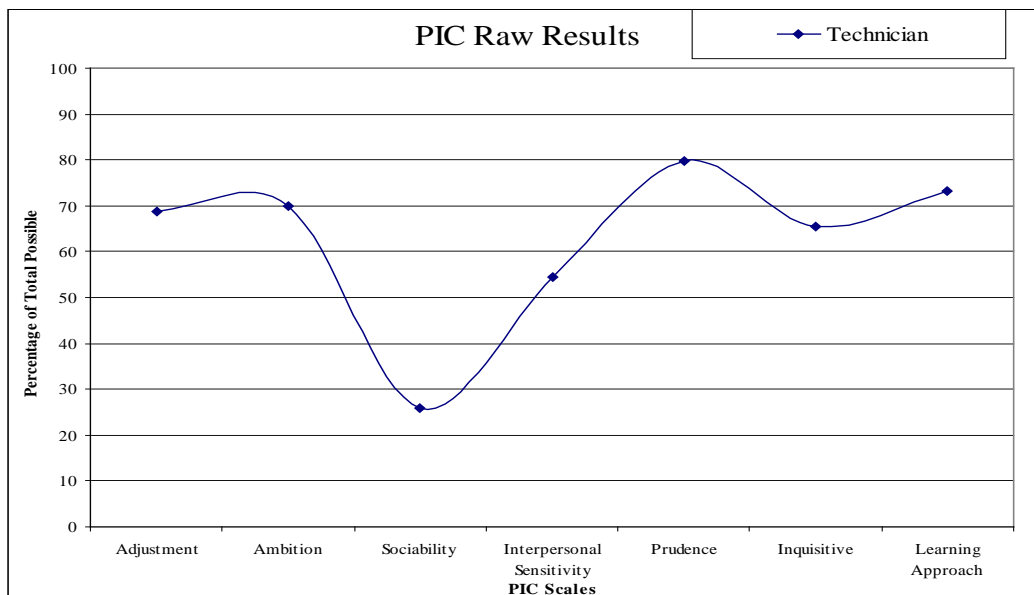
3.4 PIC Results. SMEs ($N = 9$) with knowledge of the Sales Representative job completed the PIC. Hogan conducted inter-rater reliability analyses to determine rater agreement. Including all raters yielded an inter-rater reliability coefficient of .97, indicating a high degree of agreement among raters. The PIC scores were averaged across SMEs and converted to percent of total possible, resulting in a profile of the personal characteristics important to perform the job successfully. The number of items on each scale varies according to the number of personality facets associated with that scale. There is one item for each facet and one overall item for each scale. As a result, the total possible score on each scale ranges from 15 (Learning Approach) to 27 (Adjustment). Table 3.2 presents raw score results for each scale. Figure 3.1 presents scores converted to a percentage of total possible. These results reveal that characteristics associated with being calm and even-tempered (Adjustment), energetic and goal-oriented (Ambition), rule-abiding and conscientious (Prudence), creative and interested in problems (Inquisitive), and concerned with building job-related knowledge (Learning Approach) are most critical to successful performance of ABC Company Sales Representative jobs.

Table 3.2 Raw Score PIC Means and Standard Deviations

PIC Scale	Mean	Total Possible	SD
Adjustment	18.56	27	3.88
Ambition	14.67	21	2.29
Sociability	4.67	18	2.69
Interpersonal Sensitivity	9.78	18	2.68
Prudence	19.11	24	1.76
Inquisitive	13.78	21	1.86
Learning Approach	11.00	15	1.80

Note. $N = 9$; SD = Standard Deviation.

Figure 3.1 PIC Profile for the Sales Representative Job



3.5 Motivational Improvement Characteristics. Over the last 30 years, researchers (cf. Holland, 1973, 1985, 1997; Schneider, 1987) proposed that, to understand organizational behavior, it is necessary to understand the values, interests, and personalities of an organization’s members. Holland argues, “The character of an environment reflects the typical characteristics of its members. If we know what kind of people make up a group, we can infer the climate the group creates” (1985, p. 35). Similarly, Schneider (1987) argues that organizations attract, select, and retain particular kinds of people, and the climate of an organization is a function of the kind of people it retains. Both Holland and Schneider define the climate of an organization in terms of the members’ characteristics rather than their requisite tasks. As such, taxonomies of work environments based on worker characteristics may predict work outcomes better than taxonomies based on task characteristics. Put another way, a person-centered analysis should be more predictive of person-job fit than a task analysis of work requirements.

The MIC section of the JET assesses the environment in which an employee works and the values that help define ideal workgroup climate. These values include interests such as work quality, social interaction, helping others, profitability, enjoyment, accomplishment, recognition, technology, predictability, and adherence to conservative management values. The MIC provides a taxonomy that defines the organization’s or the workgroup’s occupational environment.

The MIC contains 40 items across 10 dimensions that are rated using a scale ranging from “0” (*Does Not Describe the Work Group*) to “3” (*Substantially Describes the Work Group*), resulting in a total possible raw score of 12 for each dimension. The names and descriptions of the scales comprising the MIC appear in Table 3.3. Hogan computes scale scores on the MIC by (a) summing the item responses that correspond to each of the eleven scales, (b) averaging the scores for each scale across raters, and (c) converting the average scale scores to a percentage of total possible points. The resulting percentile scores illustrate the characteristics the SME panel judged important for the job under evaluation. A copy of the MIC appears as the Work Preferences section of the JET in Appendix B. The 40 items align with the ten MVPI scales, as shown in Table 3.3.

Table 3.3 MVPI and MIC Scale Definitions

Scale Name	Definition
	<i>The degree to which a person values...</i>
Aesthetics	work quality and artistic endeavors
Affiliation	friendship and social interaction
Altruistic	helping and caring for others
Commerce	business and financial matters
Hedonism	fun and having a good time
Power	accomplishment and competition
Recognition	praise and recognition
Science	the pursuit of knowledge
Security	certainty and predictability in life
Tradition	history and old-fashioned virtues

3.6 MIC Results. SMEs (N = 9) rated the 40 MIC items. Including all raters in subsequent reliability analyses yielded an inter-rater reliability coefficient of .82, indicating a good degree of agreement among raters. Table 3.4 presents raw score results for each scale. Figure 3.2 presents scores converted to a percentage of total possible.

Table 3.4 Raw Score MIC Means and Standard Deviations

MIC Scales	Mean	Standard Deviation
Aesthetics	4.89	1.90
Affiliation	5.00	2.35
Altruistic	6.11	2.42

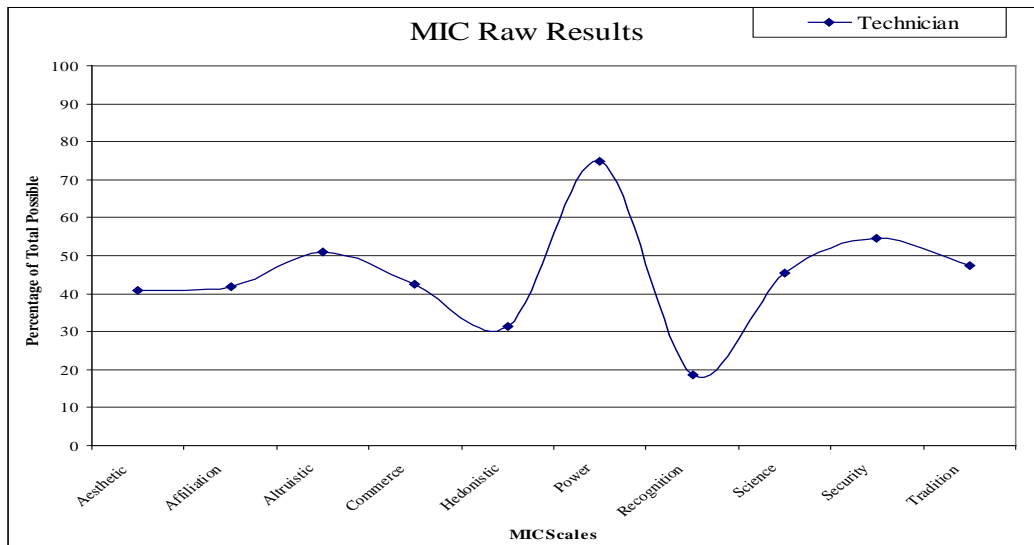
Table 3.4 Raw Score MIC Means and Standard Deviations (continued)

MIC Scales	Mean	Standard Deviation
Commerce	5.11	2.42
Hedonism	3.78	2.28
Power	9.00	2.78
Recognition	2.22	1.39
Science	5.44	2.19
Security	6.56	1.94
Tradition	5.67	2.87

Note. N = 9.

As shown in Table 3.4 and Figure 3.2, SMEs rated values associated with Power, as defining ideal environmental characteristics. This pattern of scores suggests an environment characterized by achievement and influence (Power). Conversely, SMEs rated characteristics associated with fun and pleasure (Hedonism) and acknowledgement (Recognition) as being the least relevant to ABC Company Sales Representative performance.

Figure 3.2 MIC Profile for the Sales Representative Job



3.7 Competency Evaluation Tool. McClelland and his colleagues (e.g., Boyatzis, 1982) introduced the concept of *competency*, which they defined as performance capabilities that distinguish effective from ineffective personnel. McClelland defined competencies empirically in terms of the requirements of particular jobs in particular contexts. This rigorous approach is rare in a field characterized by ad hoc competency models. The *Principles* recognize that competency modeling is used by many organizations as a means for describing broad requirements for a wide range of jobs. Every existing competency model can be organized in terms of a “domain model” first proposed by Warrenfeltz (1995). The model includes four domains: (a) Intrapersonal skills, (b) Interpersonal skills, (c) Technical skills, and (d) Leadership skills. R. Hogan and Warrenfeltz (2003) argued that these four domains form a natural, overlapping developmental sequence, with development of the later skills depending on the appropriate development of the earlier skills. These domains also form a hierarchy of trainability, in which the earlier skills are harder to train than the later skills.

Bartram (2005) analyzed the structure of the universe of competencies, which he defined as “sets of behaviors that are instrumental to the delivery of desired results” (Bartram, Robertson, & Callinan, 2002, p. 7). He began with two metaconcepts that corresponded with “getting along” and “getting ahead.” He expanded the metaconcepts to include eight broad competency factors—the “Great Eight.” Competencies that promote getting along include Supporting and Cooperating, Interacting and Presenting, Organizing and Executing, and Adapting and Coping; competencies that promote getting ahead included Leading and Deciding, Analyzing and Interpreting, Creating and Conceptualizing, and Enterprising and Performing. Bartram’s competencies overlap with the generalized work activities that Jeanneret, Borman, Kubisiak, and Hanson (1999) proposed as a comprehensive taxonomy of work behaviors required in the US economy.

The CET is designed to serve as a comprehensive list of competencies that appear in (or can be translated from) the major taxonomic sources, including the Great Eight. The CET asks SMEs to indicate the degree to which each of 56 listed competencies is related to successful performance in the job or job family under study. Each listed competency is accompanied by a brief definition. Raters are asked to 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,” where the scale anchor is labeled “*Important to performance*.” The SME ratings provide a basis for structural models to examine comparability of job

domains and their competencies across jobs within and across families (J. Hogan, Davies, & R. Hogan, 2007).

3.8 CET Results. SMEs ($N = 9$) rated the 56 CET competencies. Including all raters in subsequent reliability analyses yielded an inter-rater reliability coefficient of .86, indicating a strong degree of agreement among raters. A copy of the CET appears as the Job Competencies section of the JET in Appendix B.

CET results based on SME ratings appear in Table 3.5. As seen in this table, the competencies rated as most critical (one standard deviation above the mean) include problem solving, dependability, and planning/organizing.

Table 3.5 Raw Score CET Means and Standard Deviations

Competency	M	SD	Competency	M	SD
Problem Solving	3.89	0.33	Influence	2.78	0.67
Dependability	3.78	0.44	Building Partnerships	2.67	1.12
Planning/Organizing	3.78	0.44	Continuous Learning	2.56	0.73
Detail Orientation	3.78	0.44	Conflict Resolution	2.56	1.01
Job Knowledge	3.67	0.71	Impact	2.44	0.88
Achievement Orientation	3.67	0.50	Teaching Others	2.44	1.13
Flexibility	3.67	0.71	Safety	2.44	1.24
Verbal Direction	3.56	0.53	Leadership	2.44	1.13
Adaptability	3.56	0.53	Gaining Commitment	2.33	0.71
Technical Knowledge	3.56	0.53	Meeting Participation	2.22	1.20
Judgment	3.56	0.53	Formal Presentation	2.11	1.17
Trustworthiness	3.44	0.73	Strategic Vision	2.11	1.05
Stress Tolerance	3.22	0.83	Industry Knowledge	2.11	1.27
Vigilance	3.11	0.78	Management Performance	2.11	1.54
Innovation	3.11	0.93	Facilitating Change	2.00	1.22
Oral Communication	3.11	0.78	Risk Taking	2.00	0.87
Decision Making	3.11	0.60	Information Monitoring	1.89	1.17
Written Communication	3.00	0.87	Negotiation	1.89	1.36
Teamwork	3.00	0.87	Building Teams	1.78	1.09
Initiative	3.00	0.87	Follow-Up	1.56	1.33
Work Attitude	3.00	0.71	Delegation	1.56	1.24
Organizational Commitment	2.89	0.78	Customer Service	1.56	1.33
Integrity	2.89	0.78	Employee Development	1.44	1.59

Table 3.5 Raw Score CET Means and Standard Deviations (continued)

Competency	M	SD	Competency	M	SD
Interpersonal Skills	2.89	0.78	Citizenship	1.33	1.22
Math Skills	2.89	0.60	Meeting Leadership	1.22	1.39
Data Entry	2.78	1.20	Sales Ability	0.56	1.13
Build Strategic Work Relationships	2.78	0.97	Facilitative Sales	0.56	1.13
Training Performance	2.78	0.67	Consultative Sales	0.56	1.13

Note. *N* = 9. *M* = Mean; *SD* = Standard Deviation.

3.9 Job Analysis Summary. Job analysis evidence indicates that attributes assessed by the HPI and MVPI are important for Sales Representative job performance at ABC Company.

- PIC results emphasized the importance of characteristics associated with being calm and even-tempered (Adjustment), energetic and goal-oriented (Ambition), rule-abiding and conscientious (Prudence), creative and interested in problems (Inquisitive), and concerned with building job-related knowledge (Learning Approach).
- MIC results helped define the ideal environment in which ABC Company Sales Representatives work. Research indicated successful Sales Representatives value environments where achievement and influence (Power) are emphasized and encouraged.
- CET results supported the importance of competencies for problem solving, dependability, and planning/organizing.

The close correspondence between JET components provides support for using predictor measures capable of identifying candidates likely to demonstrate these characteristics.

Based on the job analysis evidence, it is reasonable to conclude that the HPI and MVPI predict performance as it relates to personal characteristics and competencies related to performance in the ABC Company Sales Representative roles. As compared to other methods often employed as a foundation for candidate screening, the HPI and MVPI are particularly advantageous for the following reasons:

- Besides overall job performance, personality measures predict counterproductive work behaviors (Berry, Ones, & Sackett, 2007), team performance (Bell, 2007; Peeters, Van Tuijl, Rutte, & Reyman, 2006), and expatriate performance (Mol, Born, Willemsen, & Van Der Molen, 2005).
- Including personality measures within traditional selection batteries is one way to decrease the likelihood of adverse impact against minority groups (Campbell, 1996); using personality results in smaller group differences than those found for ability measures (Foldes, Duehr, & Ones, 2008).
- Cognitive ability measures tend to predict technical performance, not interpersonal skills or initiative. Moreover, these tools tend to discriminate in terms of gender, age, and race/ethnicity (Hausdorf, LeBlanc, & Chawla, 2003).
- Biodata measures tend to be custom-developed tools (Bliesener, 1996), not readily available in an off-the-shelf form, and tend to lack the structure and interpretability necessary to enable professional development.
- Work sample measures and assessment centers, while valid, tend to discriminate in terms of race and ethnicity much more than previously thought (Dean, Roth, & Bobko, 2008; Roth, Bobko, McFarland, & Buster, 2008).
- Integrity tests predict counterproductive work behaviors, yet appear highly related to existing FFM measures and begs the question: “what is left in integrity beyond the Big Five?” (Berry, Sackett, & Wiemann, 2007, p. 278).
- Although face valid, interviews tend to be subjective and need structure in order to be a strong predictor of job performance (McDaniel, Whetzel, Schmidt, & Mauer, 1994).

4 - META-ANALYSIS RESULTS FOR EVALUATING VALIDITY GENERALIZATION OF PERSONALITY MEASURES

Prior to 1977, criterion-related validity research involved testing the hypothesis that a particular predictor variable (e.g., a cognitive ability measure) covaried reliably with a particular criterion variable (e.g., performance in training). Researchers then repeated this test using different samples, predictors, and criterion measures. Not surprisingly, results from these studies often differed between locations with similar jobs, and this variability made firm generalizations difficult. More importantly, this variability challenged the scientific integrity of the entire enterprise of personnel selection.

Researchers often explained the differences in study results in terms of situational specificity, the view that the validity of a measure is specific to the contexts and jobs under study (Gatewood & Feild, 1994; Ghiselli, 1966; Ghiselli & Brown, 1955); these differences required conducting separate validation studies for each organization, job, or group of employees. Using a large database, Schmidt and Hunter (1977) presented evidence showing that the variability in validity coefficients in single-location studies was due to statistical and procedural factors (Guion, 1998, p. 368)—idiosyncratic factors that could be ignored or statistically corrected.

Many psychologists now agree that “validity” is a unitary concept, not a type of method or an attribute of a test. Guion and Highhouse (2006, p. 134) define validity as “a property of the inferences drawn from test scores.” In addition, many psychologists now agree that more ways exist to assess the validity of inferences from test scores than a specific local study of their relationship with job relevant criteria (McPhail, 2007). When available, researchers may use Validity Generalization (VG) evidence in place of local validation studies to support the use of a selection procedure (Gatewood & Feild, 1994; Society for Industrial and Organizational Psychology, 2003). As indicated by the *Principles*:

At times, sufficient accumulated validity evidence is available for a selection procedure to justify its use in a new situation without conducting a local validation research study. In these instances, use of the selection procedure may be based on demonstration of the generalized validity inferences from that selection procedure, coupled with a compelling argument for its applicability to the current situation. Although neither mutually exclusive nor exhaustive, several

strategies for generalizing validity evidence have been delineated: (a) transportability, (b) synthetic validity/job component validity, and (c) meta-analytic validity generalization (p. 27).

Schmidt and Hunter (1977) introduced meta-analysis to psychometric research. Meta-analysis is a methodology for aggregating correlation coefficients from independent studies testing the same hypothesis. They argued 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) and not unique jobs or situations. Subsequent research suggests that the correlations between performance measures and cognitive ability tests (Hunter, 1980; Schmidt & Hunter, 1977), biographical data inventories (Schmidt & Rothstein, 1994), personality inventories (Barrick & Mount, 1991; Barrick, Mount, & Gupta, 2003; Berry et al., 2007; Dudley, Orvis, Lebiecki, & Cortina, 2006; J. Hogan & Holland, 2003; Judge, Bono, Ilies, & Gerhardt, 2002; Salgado, 1997, 1998; Tett, Jackson, & Rothstein, 1991), assessment center exercises (Arthur, Day, McNelly, & Edens, 2003; Meriac, Hoffman, Woehr, & Fleisher, 2008), and situational judgment tests (McDaniel, Morgeson, Finnegan, Campion, & Braverman, 2001) generalize across studies.

The *Principles* recognize meta-analysis as a method “that can be used to determine the degree to which predictor-criterion relationships are specific to the situations in which the validity data have been gathered or are generalizable to other situations, as well as to determine the sources of cross-situation variability” (Aguinis & Pierce, 1998, p. 28). Of the three VG methods, meta-analysis provides the most generalizable results, but relies exclusively on criterion-related validity studies. Transportability and synthetic/job component validity research is less generalizable, but can use either content or criterion-related research as source data. J. Hogan et al. (2007) demonstrate the use of all three methods in combination.

Meta-analysis averages findings from multiple studies of the same relationship to provide a best estimate of ρ (i.e., the population correlation) by controlling for error due to sampling, measurement range restriction, and unreliability in predictor and criterion measures (Smith & Glass, 1977). In addition, meta-analyses include carefully developed criteria for deciding what studies to include, what variables to code, effect size comparisons, and moderator identification. Ideally, a meta-analysis includes all relevant studies. However, this is often impossible because researchers are less likely to publish studies with insignificant results. Rosenthal (1979) notes that such omissions are problematic

for meta-analysis research as they produce results based on too few studies, small sample sizes, and an atheoretical base.

According to the *Principles*, “reliance on meta-analysis results is more straightforward when they are organized around a construct or set of constructs” (p. 30). 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 the validity of personality predictors (see Table 4.2). A construct driven approach 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 the results.

The next section reviews evidence accumulated from large-scale meta-analyses and empirical studies that support the proposition that personality measures are valid predictors of job performance across occupational groups.

4.1 The Five-Factor Model and Job Performance. Table 4.1 presents the results of six, large-scale meta-analyses summarizing relations between the FFM scales and overall job performance. Note that the correlations presented in the table are *uncorrected* estimates. Across studies, the Conscientiousness/Prudence scale appears to be the most consistent predictor of job performance. The Emotional Stability/Adjustment and Agreeableness/Interpersonal Sensitivity scales also predict performance across studies, although the magnitudes of the correlation coefficients are generally smaller than those of the Conscientiousness/Prudence scale.

Table 4.1 FFM Meta-Analysis Results: Uncorrected Validity Estimates

Study	FFM Scales						
	1	2	3	4	5	6	7
A.	.15	.10	.10	.22	.12	.18	.18
B.	.05	.01	.01	.04	.12	.01	.01
C.	.09	.05	.05	.01	.10	.04	.04
D.	.09	.06	.06	.07	.14	.04	.04
E.	.25	.20	NA	.18	.22	.20	.15
F.	.17	.22	.22	.06	.20	.16	.16

Note. 1 = Emotional Stability/Adjustment; 2 = Ambition/Extraversion; 3 = Extraversion/Sociability; 4 = Interpersonal Sensitivity/Agreeableness; 5 = Conscientiousness/Prudence; 6 = Openness/Inquisitive; 7 = Openness/Learning Approach. A = Tett, Jackson, & Rothstein (1991). Sample sizes = 280 (Agreeableness) to 2,302 (Extraversion). B = Barrick & Mount (1991). Sample sizes = 3,694 (Emotional Stability) to 4,588 (Conscientiousness). C = Salgado (1997). Sample sizes = 2,722 (Openness) to 3,877 (Emotional Stability). D = Hurtz & Donovan (2000). Sample sizes = 5,525 (Openness) to 8,083 (Conscientiousness). E = J. Hogan & Holland (2003). Sample sizes = 1,190 (Inquisitive) to 3,698 (Ambition). F = Judge et al., (2002). Sample sizes = 7,221 (Openness) to 11,705 (Extraversion). NA = Not Available

Unlike earlier meta-analyses, which evaluated the validity of the FFM in relation to indices of overall performance, J. Hogan and Holland (2003) aligned the FFM scales with performance criteria. Prompted by earlier calls for research (Ashton, 1998; J. Hogan & Roberts, 1996; Paunonen, Rothstein, & Jackson, 1999), J. Hogan and Holland meta-analyzed 43 independent samples ($N = 5,242$) included in studies using the HPI. For this analysis, J. Hogan and Holland aligned HPI scales with criterion measures reflecting FFM themes. As seen in Table 4.2, the relations between HPI scales and overall performance ratings proved stronger than previous FFM research. Results indicated the following operational validities: Adjustment = .37, Ambition = .31, Interpersonal Sensitivity = .25, Prudence = .31, Inquisitive = .29, Learning Approach = .22. As shown in Table 4.2, the fully corrected correlation coefficients ranged from .25 (HPI Learning Approach) to .43 (HPI Adjustment).

Table 4.2 Meta-Analysis Results for HPI Scales with Construct-Aligned Criteria

HPI Scale	N	K	r_{obs}	ρ_v	ρ
Adjustment	2,573	24	.25	.37	.43
Ambition	3,698	28	.20	.31	.35
Sociability	N/A	N/A	N/A	N/A	N/A
Interpersonal Sensitivity	2,500	17	.18	.25	.34
Prudence	3,379	26	.22	.31	.36
Inquisitive	1,190	7	.20	.29	.34
Learning Approach	1,366	9	.15	.22	.25

Note. N = number of participants across K studies; K = number of studies; r_{obs} = mean observed validity; ρ_v = operational validity corrected for range restriction and criterion unreliability; ρ = true validity at scale level corrected for range restriction and predictor-criterion unreliability; N/A indicates insufficient data to compute meta-analysis. All observed correlations are statistically significant at $p < .05$.

In application, organizations should use multiple personality scales to screen job applicants. The rationale for using multiple scales is to account for the various personal characteristics necessary for success, as any one scale is unlikely to map the entire performance domain of any job. J. Hogan and Holland (2003) illustrate the value of using multiple scales. For example, to predict criteria concerning the ability to tolerate stress, the HPI Adjustment scale is the best single predictor. However, to predict resourceful problem solving or the ability to generate creative solutions, the HPI Inquisitive scale yields the largest validity coefficient. In addition to using multiple personality scales to predict performance, Schmidt and Hunter (1998) provided evidence supporting incremental validity of personality measures over General Mental Ability (GMA), or “g.” In reviewing

over 85 years of selection research, Schmidt and Hunter showed that adding a measure of Conscientiousness to GMA tests improved validity by 18%. Furthermore, the addition of an integrity measure to GMA improved validity by 27%, the largest increment across 18 other selection measures (e.g., work sample tests, interviews, job knowledge, biographical data, and assessment centers).

Across studies represented in Tables 4.1 and 4.2, the meta-analysis results support the generalizability of the Conscientiousness/Prudence, Emotional Stability/Adjustment, and Agreeableness/Interpersonal Sensitivity measures across occupations and industries. Moreover, the results from J. Hogan and Holland (2003) support the generalizability of every scale on the HPI except Sociability for predicting personality-saturated criteria. Empirical evidence supports validity generalization of three FFM measures (Conscientiousness, Emotional Stability, and Agreeableness) in general, and six of the seven HPI scales in particular.

4.2 Personality-Based Validity Coefficient Benchmarking. Criteria used to designate a “meaningful” predictor-criterion correlation remain poorly defined. Consequently, researchers define the meaningfulness of a correlation solely on its magnitude, which is reasonable but not sufficient. Interpreting the usefulness of a correlation coefficient based solely on magnitude is one strategy, since the percentage of variance accounted for in the criterion increases with the magnitude of the correlation. However, at what point does the magnitude of a correlation become “meaningful”? Is it .10, .20, .30, or .70? Rather than focus exclusively on the magnitude of observed correlation coefficients, a benchmarking strategy is more appropriate.

The assessment literature includes many studies that evaluate the validity of the FFM personality measures across jobs, organizations, and industry types. Hough and Oswald (2008) summarize some of the major findings. These studies reflect the appropriate benchmark from which to evaluate the validity of the FFM scales. By comparing validity coefficients found in this technical report to the validity coefficients reported in the peer-reviewed literature, it is possible to derive some general conclusions about the validity and utility of potential personality predictors of job performance.

To establish a benchmark from which to compare the generalized validity coefficients presented in this report, Table 4.3 summarizes the sample-weighted validity coefficients of various predictors reported in the scientific literature. The sample-weighted validity of GMA tests, which are widely regarded as the “best” predictors of job performance, is only $r = .21$. Relative to the sample-weighted

validity coefficients reported by J. Hogan and Holland (2003), the validity of GMA appears less predictive of construct-oriented criteria (not overall supervisory ratings of job performance) than the HPI Adjustment and Prudence scales.

Table 4.3 Comparative Validity of Assessments for Predicting Overall Job Performance

Study	Predictor	r_{obs}
A.	Conscientiousness Tests	.18
B.	Integrity Tests	.21
C.	Structured Interviews	.18
D.	Unstructured Interviews	.11
E.	Situational Judgment Tests	.20
F.	Biodata	.22
G.	General Mental Ability	.21
H.	Assessment Centers	.28

Note. r_{obs} = mean observed validity; A = Mount & Barrick (2001). B = Ones, Viswesvaran, & Schmidt (1993). C & D = McDaniel et al. (1994). E = McDaniel, Hartman, Whetzel, & Grubb (2007). F = Bliesener (1996). G = Pearlman, Schmidt, & Hunter (1980). H = Arthur et al. (2003).

Also noteworthy are the validity coefficients of FFM scales reported in five other meta-analyses (see Table 4.1). Excluding J. Hogan and Holland's (2003) results, the validity of Emotional Stability measures ranges between .05 (Barrick & Mount, 1991) and .17 (Judge et al., 2002). A similar pattern exists for Conscientiousness measures, with validity coefficients ranging between .10 (Salgado, 1997) and .20 (Judge et al.). For the remaining FFM scales, only Tett et al. (1991) and Judge et al. report validity coefficients at or above .10.

J. Hogan and Holland (2003) present validity coefficients (see Table 4.2) that are, on average, 24% larger in magnitude than the highest correlation coefficients reported in previous personality-based meta-analyses. There are three important differences between the J. Hogan and Holland study and other studies. First, they aligned predictors with indices of job performance. J. Hogan and Holland reasoned that personality scales are not designed to be omnibus predictors of job performance, but rather to predict *facets* of job performance. By matching predictors and performance criteria, the observed validities increased. Campbell (1990) articulated this construct alignment strategy, although it is seldom used. Second, most early studies evaluating the validity of FFM personality scales relied on classification schemes to translate scales from non-FFM instruments (e.g., California Psychological Inventory) into the FFM domains. During the classification process, raters misclassified scales into FFM dimensions. When

errors like this occur, validity decreases. Finally, J. Hogan and Holland relied on a single personality tool (HPI), which eliminated the possibility of coding or classification errors. Together these three factors help untangle the personality literature and establish the appropriate benchmark from which to evaluate the validity of personality scales in occupational settings.

4.3 Summary of Meta-Analysis Results for Generalizing Validity of Five-Factor Model Personality Measures. Researchers are skeptical about the merits of some procedures used in meta-analyses. In particular, they believe corrections can be used inappropriately to overestimate predictor-criterion relationships. Nonetheless, the meta-analyses described above provide lower bound estimates of the validity of personality measures for predicting job performance. Reviewing the research on meta-analysis evidence permits certain conclusions. First, meta-analysis results strongly support the validity of Conscientiousness measures for predicting various job criteria, including overall job performance. Second, evidence to support the generalized validity of Emotional Stability and Agreeableness for job performance is moderate to strong, particularly as the criterion becomes more saturated with requirements for interpersonal skill(s). Lastly, the validity coefficients for Extraversion/Surgency measures (particularly the HPI Ambition scale) are strong for predicting criteria associated with achieving results and leading others. The remaining Five Factor dimension—Intellect/Openness to Experience—is not as generalizable as the others because it is relevant for a smaller range of jobs and criteria.

Based on meta-analysis results for personality measures, we conclude that an assessment of Conscientiousness, Emotional Stability, and Agreeableness should generalize and predict performance for Sales Representatives. The next section reviews evidence accumulated from a meta-analysis conducted at the job family level based on the Hogan archive.

4.4 Meta-Analysis Evidence for Generalizing Validity of the HPI at the Job Family Level. The Hogan archive contains hundreds of studies examining jobs classified into seven job families. Based on studies within each job family, we meta-analyzed validity coefficients for each HPI scale. Hogan used the procedures specified by Hunter and Schmidt (1990) to accumulate results across studies and assess effect sizes. All studies used zero-order product-moment correlations, which eliminated the need to convert alternative statistics to values of r . We report operational validities, which we have corrected for sampling error, unreliability in the criterion measure, and range restriction. We did not correct correlation coefficients for predictor unreliability to estimate validity at the construct level. Although some (e.g., Mount & Barrick, 1995; Ones,

Viswesvaran, & Schmidt, 1993) argue this is a relevant artifact that can be corrected, Hogan believes it is premature to estimate the validity of a perfect construct when there is no firm agreement on the definition of the construct itself. Results, therefore, represent relationships between HPI scales and job performance.

Hunter and Schmidt (1990) argue that samples should contribute the same number of correlations to meta-analysis results to avoid bias. Hogan averaged correlations within studies so that each sample contributed only one point estimate per predictor scale. For example, if more than one criterion was available for any study, we averaged the correlations between each predictor scale and those criteria to derive a single point estimate of the predictor-criterion relationship. 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).

Hogan also computed a range restriction index for HPI scales. Following procedures described by Hunter and Schmidt (1990), Hogan divided each HPI scale's within-study standard deviation by the standard deviation reported by R. Hogan and J. Hogan (1995). This procedure produced an index of range restriction for each HPI scale for each study. We used mean replacement within job family to estimate range restriction correction factors when within study standard deviation was unavailable.

Although some researchers (e.g., Murphy & De Shon, 2000) argue against the use of rater-based reliability estimates, Hogan followed procedures outlined by Barrick and Mount (1991) and Tett et al. (1991), and used the .508 reliability coefficient proposed by Rothstein, Schmidt, Erwin, Owens, and Sparks (1990) to estimate the reliability of supervisory ratings of job performance. Using job analysis information, we classified the ABC Company Sales Representative job into the "Sales Representatives and Specialists" job family, encompassing those jobs that require individuals to combine specialized knowledge and manual skills to perform specific, vital functions within the organization. Hogan has accumulated a number of criterion-related studies for this job family.

Hogan identified 17 relevant criterion-related studies in the Hogan archive that served as a foundation for establishing meta-analysis evidence of the validity of the HPI for predicting job performance. Table 4.4 contains the operational validities between overall performance and each HPI scale. Consistent with previous research (see section 4.3), the HPI Adjustment, Ambition, Interpersonal

Sensitivity, and Prudence (FFM Emotional Stability, Extraversion [in part] Agreeableness, and Conscientiousness) scales were positively related to performance. In contrast, the HPI Sociability (FFM Extraversion [in part]) scale was negatively related to performance.

Table 4.4 Meta-Analysis Results from HPI-Performance Correlations for Sales Representatives and Specialists Jobs

Job Family	K	N	ADJ	AMB	SOC	INP	PRU	INQ	LRN
Sales Representatives & Specialists	17	2,207	0.22*	0.18*	-0.07*	0.11*	0.19*	0.04	0.05

Note. Results presented in the table are operational validities; * = 95% confidence interval did not include 0; K = number of studies; N = number of participants across K studies; ADJ = Adjustment; AMB = Ambition; SOC = Sociability; INP = Interpersonal Sensitivity; PRU = Prudence; INQ = Inquisitive; LRN = Learning Approach.

4.5 Meta-Analysis Using the MVPI. Note that meta-analysis evidence for the validity of the MVPI is unavailable because the MVPI is not a generalizable predictor of job performance, since workplace culture and motivators are not consistent across companies or even specific job families (Lock & Boudreau, 2004).

5 – TRANSPORTABILITY OF VALIDITY

The next step in the validity generalization process involves transporting validity evidence established for one job and using it as a foundation for candidate screening in a similar job. The *Uniform Guidelines* supports transportability of validity and is the primary reference for determining when it is appropriate to transport validity evidence from one job to another. In addition, Hoffman, McPhail, and colleagues (Hoffman & McPhail, 1998; Tippins, McPhail, Hoffman, & Gibson, 1999) discuss the technical requirements that should be satisfied before transporting validity evidence in situations that preclude local validation. Finally, Johnson and Jolly (2000) provide an empirical demonstration of the method and note the lack of guidance for its appropriate use.

The *Principles* considers transportability of validity as one of three VG strategies capable of justifying the appropriateness and applicability of a selection procedure. This assumes that the original validation study is technically sound and the target and referent jobs can be described as “closely related” (*Bernard v. Gulf Oil Corp.*, 1981). Situations where transportability might apply include those in which organizations must choose a selection procedure for the same job across multiple locations and different companies or for different jobs with similar requirements. It might also be a useful strategy for validating screening guidelines for different job titles within a single job family (see Gibson & Caplinger, 2007).

The *Uniform Guidelines*, the *Standards*, and the *Principles* all recognize transportability of selection procedures (cf. Tippins, 2003). Although employment discrimination experts distinguish between these three documents, Hogan focuses on their common themes. For example, all three require that the original research be technically adequate. The *Uniform Guidelines* emphasize the need for evidence regarding fairness, validity, and job similarity as criteria for transportability. Personality-based selection procedures typically yield no adverse impact, satisfying requirements set by the *Uniform Guidelines* and precedents set in many courts (Lindemann & Grossman, 1996). However, fairness is considered a social rather than a psychometric issue.

The *Standards* emphasize the need for good cumulative research (e.g., meta-analysis) and discourage reliance on a single local validation study as a foundation for transportability of validity unless the referent study is “exceptionally sound.” Interestingly, the original design for transportability of a selection procedure relies on a single referent validation study. The *Principles* emphasize the importance of establishing similarity between the original

(referent) and target jobs. Researchers can establish evidence of similarity based on job requirements, job context, and job applicants. For personality-based selection systems, demonstrating job similarity has been challenging because few personality-related job analysis methods were available. Notable exceptions are Raymark, Schmit, and Guion (1997) and Hogan's JET methodology (Foster et al., 2009). Hogan estimates similarity using converging evidence and professional judgment.

5.1 Transportability Results. Hogan conducts transportability of validity research by analyzing the current target job in qualitative and quantitative terms. First, Hogan identifies a marker job for which a criterion-related validity study already exists in the Hogan archive. Next, Hogan establishes similarity between the target and marker jobs through close alignment of job descriptions, O*NET codes, and JET profiles. The O*NET typology provides a standard external metric for rating job similarity.

In the present study, Hogan did not identify a specific job in the Hogan archive that met the stringent requirements of single-study transportability. Alternatively, Hogan could nominate jobs in the archive that are similar enough to the target job to be used as a hybrid form of transportability validity evidence (i.e., very similar in respect to the tasks and responsibilities associated with performing the job, but not close enough for single-study transportability). However, in the present case, we defer to the meta-analysis and the synthetic/job component validation sections within this report.

6 - SYNTHETIC/JOB COMPONENT VALIDITY

The most specific validity generalizability evidence results from synthetic validity/job component validity research. Mossholder and Arvey (1984) noted that, where meta-analysis relies on global evaluations of job similarity, synthetic validity requires a more detailed examination of the work. The strategy is criterion driven and involves finding the best set of predictors comprehensively representative of the criterion space.

Lawshe (1952) introduced synthetic validity over 50 years ago. With a few notable exceptions (e.g., Guion, 1965; McCormick, DeNisi, & Shaw, 1979; Primoff, 1959), early researchers largely ignored the approach because they believed that assessment validity was specific to situations. The interpretive review and demonstration by Mossholder and Arvey (1984) is a rare exception. Mossholder and Arvey defined synthetic validity as “the logical process of inferring test-battery validity from predetermined validities of the tests for basic work components” (p. 323). If we know the key components of a job, we can review prior criterion-related studies predicting those components. We then “synthesize” the valid predictors of the key job components into an assessment battery for the new job (Balma, 1959; Lawshe, 1952). Brannick and Levine (2002) point out that synthetic validity approaches allow us to build up validity evidence from small samples with common job components. Although not popular at its inception, synthetic validity research has become increasing more studied (e.g., Hoffman, Holden, & Gale, 2000; Jeanneret & Strong, 2003; Johnson, Carter, Davison, & Oliver, 2001; McCloy, 1994, 2001; Scherbaum, 2005).

The *Uniform Guidelines* are vague about technical requirements and documentation for synthetic/job component validity, but the *Principles* explicitly include this strategy. Synthetic validation involves (a) identifying the important components of a job or jobs comprising a job family, (b) reviewing prior research on the prediction of each component, and (c) aggregating correlations across multiple studies for each component of the job to form a test battery (Scherbaum, 2005). Mossholder and Arvey (1984) summarized these requirements as follows:

“When test battery validity is inferred from evidence showing that tests measure broad characteristics necessary for job performance, the process resembles a construct validation strategy. When scores are correlated with component performance measures, the process involves criterion-related validation. The nature of the tests used in

the process (e.g., work sample vs. aptitude) may determine in part the appropriate validation strategy” (p. 323).

Job Component Validity (JCV: McCormick et al., 1979) is one type of synthetic validity. Jeanneret (1992) described JCV as falling “within the rubric of construct validity” (p. 84). Researchers have primarily used JCV to study the cognitive demands of jobs by correlating job dimensions using PAQ data (Jeanneret, 1992; Hoffman, Rashkovsky, & D’Egidio, 2007). Hoffman and McPhail (1998) examined the accuracy of JCV for predicting the observed validity of cognitive tests in clerical jobs. Few similar analyses are available for personality predictors, although Mecham (1985) and D’Egidio (2001) provide notable exceptions.

This section describes the job performance criteria (job components) and the validity of the HPI scales for predicting performance criteria across jobs. Because the concept of synthetic validity has evolved over 50 years, Hogan uses interchangeably the terms criteria, performance dimensions, job components, work components, competencies, and domains of work. Hogan used meta-analysis methods described in section 4.4 to calculate synthetic validities.

6.1 Critical Performance Dimensions. The first step in synthetic validation is conducting a job analysis to determine the important components of the job. For the current study, job analysis results defined the critical performance components for Sales Representatives. Table 6.1 presents definitions for these competencies.

Table 6.1 Definitions of Critical Job Competencies

CET Dimension	Definition
Problem Solving	Identifies and implements effective solutions to problems
Dependability	Performs work in a consistent and timely manner
Planning/ Organizing	Plans work to maximize efficiency (in time and resources) and minimize downtime
Detail Orientation	Performs work with great care and accuracy over a period of time
Job Knowledge	Understands all aspects of the job
Achievement Orientation	Strives to meet and exceed goals for self and others
Flexibility	Adapts quickly to changing circumstances and is willing to try new methods
Verbal Direction	Listens to and follows verbal directions from others

Table 6.1 Definitions of Critical Job Competencies (continued)

CET Dimension	Definition
Adaptability	Is able to change directions quickly and work without explicit guidance
Technical Knowledge	Uses existing technology and considers the use of new technology to increase productivity
Judgment	Uses and synthesizes information to solve problems, make evaluations, and draw sound conclusions based on subjective and/or objective criteria
Trustworthiness	Is honest and trustworthy

6.2 Validity of the HPI for Predicting Job Performance. The Hogan archive provides a means to identify the best predictor(s) of each competency listed in the CET section of the JET. Foster and J. Hogan (2005) mapped each of the criteria from over 200 criterion-related validity studies in the Hogan archive onto the CET dimensions and conducted a meta-analysis for each scale-by-competency relationship. These meta-analyses provide stable estimates of the relationships between the seven HPI scales and the critical competencies as rated by SMEs. They report operational validities, which they corrected for sampling error, unreliability in the criterion measure, and range restriction. Table 6.2 presents this information.

Table 6.2 HPI Correlations with Critical Job Competencies

CET Dimension	K	N	ADJ	AMB	SOC	INP	PRU	INQ	LRN
Problem Solving	51	5,940	0.13*	0.11*	-0.03	0.02	0.07*	0.04	0.06*
Dependability	44	4,907	0.16*	0.05*	-0.06*	0.05*	0.13*	-0.03	0.02
Planning/Organizing	22	2,166	0.10*	0.13*	0.01	0.05	0.13*	-0.01	0.04
Detail Orientation	13	841	0.07	0.03	-0.01	0.01	0.12*	-0.05	0.08
Job Knowledge	11	1,179	0.14*	0.13*	-0.01	0.04	0.00	0.07	0.04
Achievement Orientation	48	4,496	0.08*	0.19*	0.00	0.02	0.06*	0.02	0.03
Flexibility/Adaptability	22	3,126	0.16*	0.20*	0.08*	0.09*	0.05	0.07*	0.08*
Verbal Direction	4	192	0.16	0.18	-0.08	-0.10	-0.03	0.02	0.13
Technical Knowledge	29	2,546	0.06	0.13*	-0.03	-0.03	0.05	0.03	0.06
Judgment	8	1,105	0.12*	0.19*	0.10*	0.05	-0.01	0.18*	0.13*
Trustworthiness	36	3,660	0.16*	0.02	-0.04	0.11*	0.21*	-0.03	0.03
Average			0.13	0.13	-0.01	0.03	0.08	0.03	0.07

Note. Results presented in the table are operational validities; * = 95% confidence interval did not include 0; K = number of studies; N = number of participants across K studies; ADJ = Adjustment; AMB = Ambition; SOC = Sociability; INP = Interpersonal Sensitivity; PRU = Prudence; INQ = Inquisitive; LRN = Learning Approach; Vigilance excluded due to K = 1.

The correlations presented in Table 6.2, averaged for each of the seven HPI scales across the critical competencies, show that the Adjustment (.13) and Ambition (.13) scales provide stable predictors of the most important competencies associated with the Sales Representative job. The Prudence (.08) and Learning Approach (.07) scales were also positively related to the critical competencies. Note that these scales more effectively predict those performance dimensions with a common underlying construct (e.g., Flexibility/Adaptability and Adjustment; Achievement Orientation and Ambition; Trustworthiness and Prudence; Judgment and Learning Approach). This finding is important because it underscores (a) the usefulness of aligning predictors and criteria and (b) the importance of using job components rather than overall ratings of performance as criterion measures.



7 – CRITERION-RELATED VALIDITY EVIDENCE

The next step in the research process involved collecting performance data from Sales Representative incumbents at ABC Company. Aguinis, Henle, and Ostroff (2001) described criterion-related validity in terms of the relationship between the predictor (e.g., HPI Scales) and some criterion measure (e.g., job performance), with the goal of answering the basic question: how accurate are test scores in predicting criterion performance? The *Uniform Guidelines* state “evidence of the validity of a test or other selection procedure by a criterion-related validity study should consist of empirical data demonstrating that the selection procedure is predictive of or significantly correlated with important elements of job performance” (29 C.F.R. § § 1607.5 (B)).

Although there are many organizational and logistical constraints that limit the usefulness of criterion-related validity studies (McPhail, 2007), the *Uniform Guidelines* and *Principles* suggest considering this approach when a) there is an adequate, representative sample of job incumbents willing to participate, and b) development of reliable, unbiased measures of job performance is possible. The *Principles* also recommends using a relevant criterion measure, one that “reflects the relative standing of employees with respect to important work behavior(s) or outcome measures(s)” (p. 14).

Additional factors should be taken into account and used as a guide when determining whether a criterion-related validity study is appropriate to use in any given selection situation. First, practitioners should consider the design when planning the study. A predictive design predicts scores on a criterion measured at some future occurrence. For example, job applicants complete the assessment before being hired and provide measures of performance after being on the job for some time. Concurrent designs are more practical because they do not require a time delay; instead, the organization collects job performance information at the same time job incumbents complete the assessment battery. Only one empirical study has examined the effects of these two strategies on criterion-related validity using personality measures. Van Iddekinge and Ployhart’s (2008) review of criterion study design revealed that predictive designs produce slightly lower validity estimates than concurrent designs. Yet regardless of the strategy employed, the predictive value of the assessment is established by correlating assessment scores and job performance data, and other factors beyond study design may still influence this validity coefficient.

For example, the *Principles* note that this observed validity coefficient “may underestimate the predictor-criterion relationship due to the effects of range

restriction and unreliability in the predictors and/or criterion.” As a result, adjustments are available to account for these artificial reductions in variance. For instance, researchers often correct for criterion unreliability to estimate operational validity (Van Iddekinge & Ployhart, 2008). Note that Hogan corrects for measurement error and range restriction where appropriate and reports both the observed and corrected validity coefficients in our technical documentation.

Another decision researchers face is whether to use a single criterion or multiple criteria during the data collection phase of the criterion study. The literature recommends that researchers “develop criterion measures that are conceptually aligned with the latent criterion constructs and that maximize the potential use of multiple criteria for predictor validation” (Van Iddekinge & Ployhart, 2008, p. 906). Furthermore, Hogan and Holland (2003) provide strong support for using specific criteria to estimate the validity of specific predictors in operational use. Although support for using narrow criteria is growing, collecting overall performance composites still provide the best approach to estimating validity of global predictors (Guion, 1961). Researchers should continue using global criteria in the design of their performance rating forms, yet should strongly consider using specific dimensions when practical and made available.

7.1 Criterion-Related Validity Sample. Hogan conducted a concurrent criterion-related validity study by collecting assessment (i.e., HPI and MVPI) and job performance data (i.e., supervisor and performance ratings).

Next, supervisors provided ratings for each participant on several performance dimensions, which included problem solving, job knowledge, planning/organizing, achievement orientation, flexibility, verbal direction, detail orientation, judgment, dependability, engagement, job satisfaction, culture, and overall job performance. In addition, ABC Company provided averaged archival performance appraisal ratings from 2008. Hogan used both sets of ratings in their analyses.

Subjective ratings of job performance used a Likert-type scale ranging from 1 “Almost Never” to 5 “Always” and the archival appraisal rating used a Likert-type scale ranging from 1 “Requires Improvement” to 6 “Exceeds Expectations”. See Appendix C and Appendix D for the supervisor rating form and the archival appraisal rating form, respectively.

Table 7.1 presents the HPI and MVPI percentile score means and standard deviations for the incumbent sample. Table 7.2 provides the criterion score means and standard deviations for the incumbent sample.

Table 7.1 HPI and MVPI Means and Standard Deviations of Incumbent Sales Representatives

Scale	Mean	Standard Deviation
HPI Adjustment	39.8	26.9
HPI Ambition	36.4	26.3
HPI Sociability	49.7	27.4
HPI Interpersonal Sensitivity	36.9	28.4
HPI Prudence	53.4	27.0
HPI Inquisitive	62.3	26.0
HPI Learning Approach	54.7	27.2
MVPI Aesthetics	61.6	25.3
MVPI Affiliation	37.4	28.2
MVPI Altruistic	41.9	26.6
MVPI Commerce	56.5	30.9
MVPI Hedonistic	69.9	23.8
MVPI Power	47.5	30.4
MVPI Recognition	48.7	30.6
MVPI Science	70.3	25.5
MVPI Security	62.6	28.5
MVPI Tradition	46.5	24.6

Note. HPI N = 96; MVPI N = 97

Table 7.2 Criterion Means and Standard Deviations of Incumbent Sales Representatives

Scale	Mean	Standard Deviation
Problem Solving	3.76	0.72
Job Knowledge	3.80	0.80
Planning/Organizing	3.74	0.73
Achievement Orientation	3.88	0.75
Flexibility	3.82	0.78
Verbal Direction	3.96	0.66
Detail Orientation	3.89	0.73
Judgment	3.63	0.67
Dependability	3.98	0.71
Engagement	3.97	0.68
Job Satisfaction	4.14	0.69
Culture	4.08	0.64
Overall Job Performance	3.86	0.88
2008 Archival Appraisal	4.38	0.59

Note. N = 97 for all Supervisor Ratings; N = 96 for Archival Appraisal Rating

Hogan examined data (N = 78), after excluding cases due to missing data, invalid responses, and extreme outliers. Tables 7.3 and 7.4 display the observed correlations between the job performance and the HPI and MVPI scales, respectively.

Table 7.3 Observed Correlations between HPI Scales and Job Performance Indicators

	ADJ	AMB	SOC	INP	PRU	INQ	LRN
Problem Solving	-0.05	0.02	0.24*	0.04	-0.10	0.19	0.04
Job Knowledge	0.04	0.04	0.19	0.09	-0.12	0.13	0.14
Planning/Organizing	-0.02	-0.06	0.14	0.03	-0.10	0.11	-0.01
Achievement Orientation	0.06	0.13	0.23*	0.18	-0.04	0.20	0.15
Flexibility	0.09	0.15	0.28*	0.22*	-0.09	0.31*	0.20
Verbal Direction	0.03	-0.01	0.00	0.06	0.05	0.05	0.07
Detail Orientation	-0.02	-0.15	-0.05	0.02	0.02	-0.08	-0.06
Judgment	-0.03	0.00	0.05	-0.03	0.07	0.14	0.11
Dependability	0.06	0.09	0.05	0.07	0.05	0.11	0.07
Engagement	0.08	-0.05	0.09	0.15	0.01	0.11	0.10
Job Satisfaction	0.00	-0.07	0.13	0.07	0.14	0.10	0.10
Culture	0.06	0.02	0.18	0.11	0.06	0.12	0.13
Overall Job Performance	0.09	-0.02	0.02	0.03	0.14	0.09	0.08
2008 Archival Appraisal	0.25*	0.09	0.13	0.24*	-0.03	0.12	0.17

Note. N = 78; * = $p < .05$; ADJ = Adjustment; AMB = Ambition; SOC = Sociability; INP = Interpersonal Sensitivity; PRU = Prudence; INQ = Inquisitive; LRN = Learning Approach

The results in Table 7.3 indicate the HPI Interpersonal Sensitivity, Inquisitive, Sociability, Prudence, and Learning Approach scales best predict job performance.

Table 7.4 Observed Correlations between MVPI Scales and Job Performance Indicators

	AES	AFF	ALT	COM	HED	POW	REC	SCI	SEC	TRA
Problem Solving	0.10	-0.06	0.01	0.00	0.05	-0.03	0.00	0.18	-0.14	-0.02
Job Knowledge	0.06	-0.05	-0.05	-0.06	0.04	-0.10	-0.07	0.18	-0.19	-0.11
Planning/Organizing	0.18	-0.02	0.12	0.09	0.20	0.01	0.07	0.22*	-0.04	0.00
Achievement Orientation	0.11	0.06	0.08	0.13	0.08	0.04	0.04	0.20	-0.11	-0.07

Table 7.4 Observed Correlations between MVPI Scales and Job Performance Indicators
(continued)

	AES	AFF	ALT	COM	HED	POW	REC	SCI	SEC	TRA
Flexibility	0.20	0.06	0.00	0.16	0.08	0.07	0.07	0.27*	-0.15	-0.16
Verbal Direction	0.01	-0.12	0.06	0.12	-0.04	0.10	-0.03	0.25*	0.10	0.09
Detail Orientation	0.01	-0.12	0.06	0.05	0.06	-0.12	-0.02	0.15	0.00	0.04
Judgment	0.06	-0.04	0.10	0.09	0.02	-0.02	0.00	0.27*	-0.07	0.00
Dependability	0.08	0.04	0.09	0.09	0.03	0.03	-0.02	0.19	-0.12	-0.04
Engagement	0.04	-0.07	-0.01	0.18	0.05	0.00	0.03	0.22*	0.01	0.00
Job Satisfaction	0.07	-0.09	0.09	0.14	0.15	0.12	0.03	0.22*	0.02	0.02
Culture	0.09	-0.04	0.09	0.16	0.07	0.09	-0.01	0.23*	0.01	-0.03
Overall Job Performance	0.06	-0.16	-0.02	0.00	-0.04	-0.08	-0.18	0.23*	-0.10	-0.02
2008 Archival Appraisal	0.05	-0.03	-0.18	-0.14	-0.15	-0.21	-0.18	0.07	-0.20	-0.04

Note. N = 78; * = $p < .05$; AES = Aesthetics; AFF = Affiliation; ALT = Altruism; COM = Commerce; HED = Hedonistic; POW = Power; REC = Recognition; SCI = Science; SEC = Security; TRA = Tradition.

The results in Table 7.4 indicate that two MVPI scales best predicted job performance and culture fit: Commerce, and Science.

8 – RECOMMENDATIONS

Prior sections of this document describe the job analysis and validation procedures employed to confirm the HPI and MVPI’s ability to predict performance as defined in terms of dimensions related to effective performance of ABC Company Sales Representative jobs. Job analysis results (a) specified the personality-based requirements and competencies associated with the Sales Representative job as well as the work environment capable of supporting effective Sales Representative performance and (b) confirmed that the HPI and MVPI are capable of accurately measuring those requirements, competencies and environmental characteristics.

VG methods used to evaluate the validity of personality measures for predicting job performance included meta-analysis and synthetic/job component validity. Hogan also used subjective performance ratings to establish criterion-related validity evidence. The VG and criterion-related validity evidence confirm the HPI’s ability to predict critical performance dimensions associated with successful performance of ABC Company Sales Representative jobs.

Table 8.1 summarizes (a) the results of the job analysis and validity research and (b) the type of support received by each scale under each method. An expert review of these combined results as well as other qualitative information allows Hogan experts to determine the most appropriate scales used as a foundation for screening candidates into ABC Company Sales Representative jobs.

Note that VG evidence for the MVPI is unavailable because the MVPI is not a generalizable predictor of job performance, as workplace culture and motivators are not consistent across companies or even specific job families.

Table 8.1 Summary of Job Analysis and Validation Results

Scale	Job Analysis	Meta-Analysis	Transportability	Synthetic/Job Component	Criterion Validity
HPI					
Adjustment	X	XX		XX	
Ambition	X	X		XX	
Sociability		X (-)			X
Interpersonal Sensitivity		X			X
Prudence	XX	X		X	X
Inquisitive	X				XX
Learning Approach	X			X	X

Table 8.1 Summary of Job Analysis and Validation Results (continued)

MVPI	Job Analysis	Meta-Analysis	Transportability	Synthetic/Job Component	Criterion Validity
Aesthetics					
Affiliation					
Altruistic					
Commerce					X
Hedonism					
Power	XX				
Recognition					
Science					XX
Security					
Tradition					

Note. X = Moderate Support, XX = Strong Support; (-) Inverse relationship

Table 8.2 presents the results from the various research approaches used to establish validity evidence for the HPI's ability to predict critical ABC Company Sales Representative performance dimensions by predictor and validity source. While differences do exist, they emphasize the importance of using information collected from multiple sources to determine the estimated validity of the recommended selection battery. To accomplish this, Hogan calculated overall validity estimates for each validity source using the equation provided by Nunnally (1978). Averaged across the three sources, the estimated validity of the recommended selection battery is .18, supporting the use of this battery for the selection of Sales Representatives at ABC Company.

Table 8.2 Combined Validity Generalization Results

Validity Evidence	Adjustment	Prudence	Learning Approach	Total Validity
Meta-analysis	0.22	0.19	0.05	0.24
Synthetic/Job Component	0.13	0.08	0.07	0.15
Criterion	0.09	0.14	0.08	0.16
Average Validity	0.15	0.14	0.07	0.18

Combinations of personality variables are more predictive of many work-related outcomes than are single personality scales (Ones, Dilchert, Viswesvaran, & Judge, 2007; Tett & Christiansen, 2007). Consistent with this idea, personality

profiles combine multiple personality scales to maximize the prediction of job performance. Based on the job analysis, job family meta-analysis, and synthetic/job component validity, Hogan recommends that ABC Company use the HPI Adjustment, Prudence, and Learning Approach scales as a first-level screen for candidates applying for ABC Company Sales Representative jobs.

8.1 Recommended Cutoff Scores. On each scale for which validity evidence was established, Hogan recommends a minimum cutoff score; these Moderate Fit screening guidelines will screen out candidates who lack a minimal degree of the personal characteristics deemed most critical to effective performance of ABC Company Sales Representative jobs. The cutoff scores shown in Table 8.3 will help ABC Company screen out candidates who are likely to overreact or react negatively in response to setback and inconveniences (Adjustment), lack appropriate reverence for standard protocol and are prone to taking inadvisable risks (Prudence), and pass up opportunities to familiarize themselves with recent job and technical developments (Learning Approach).

Table 8.3 Recommended HPI Cutoff Scores

Accept	Reject
Adjustment \geq 5%	Adjustment $<$ 5%
Prudence \geq 10%	Prudence $<$ 10%
Learning Approach \geq 10%	Learning Approach $<$ 10%

8.2 Adverse Impact. An examination of Adverse Impact (AI) is critical for companies that use professionally developed selection instruments to make personnel decisions. In such a system, companies use selection results to determine which applicants will advance to later stages in the selection process.

To examine AI, Hogan used the 4/5ths rule, as outlined in the *Uniform Guidelines on Employee Selection Procedures* (Equal Employment Opportunity Commission, 1978; hereafter “*Guidelines*”). The *Guidelines* state:

A selection rate for any race, sex, or ethnic group which is less than 4/5ths (4/5, or 80%) of the rate for the group with the highest rate will generally be regarded by Federal enforcement agencies as evidence of adverse impact... (Section 4D, p.38297).

Since 1978, the 4/5ths rule is the acceptable guideline in the U.S. for examining AI based on group selection rate differences (e.g., Bobko, Roth, & Potosky, 1999; Reilly & Chao, 1982; Reilly & Warech 1993; Schmitt, Rogers, Chan, Sheppard &

Jennings, 1997). Some researchers are critical of the 4/5ths rule, arguing instead for significance testing (Morris & Lobsenz, 2000; Roth, Bobko, & Switzer, 2006; Shoben, 1978). However, a review of the Guidelines by Cascio and Aguinis (2001) outlined the controversies of significance testing. They state:

The controversies surrounding significance testing seem to be due mainly to how significance testing is used. Stated differently, many researchers have noted that significance testing is abused and misused (e.g., Cohen, 1994; Schmidt, 1996). Significance testing allows us to infer whether the null hypothesis that selection rates are equal in the population is likely to be false. On the other hand, significance testing is incorrectly used when: (a) conclusions are made regarding the magnitude of selection rate differences across subgroups (e.g., a statistically significant result at the .01 level is interpreted as a larger difference than a result at the .05 level) and (b) failure to reject the null hypothesis is interpreted as evidence of lack of differences in selection rates in the population (i.e., not detecting differences in the sample may be due to insufficient statistical power). (p. 204)

Cascio and Aguinis (2001) continue by stating that, since the *Guidelines'* inception in 1978, the Equal Employment Opportunity Commission (EEOC) has provided no supplemental information regarding appropriate statistical power, methodology, or significance testing levels for determining AI. Although some researchers argue for the use of significance tests to examine AI, the appropriate use of such analyses remains undefined by the EEOC. As a result, Hogan continues to use the EEOC's recommendation of the 4/5ths rule.

Calculations using the 4/5ths rule produce a ratio where (a) numbers greater than 1.00 indicate that results for minority group applicants fall within acceptable ranges more frequently than results for the majority group and (b) ratios below 1.00 indicate that results for minority group applicants fall within acceptable ranges less frequently than results for the majority group. According to the 4/5ths rule, evidence of AI exists when this ratio is less than .80.

Hogan evaluated potential selection rates for gender, age, and race/ethnicity groups using ABC Company incumbent data. Due to the small incumbent sample, Hogan also evaluated potential selection rates using a Sales Representative and Specialist HPI archival sample of applicants who provided

demographic characteristics ($N = 10,432$). For these analyses, we compared individuals who failed the moderate fit screening guidelines to those who passed the moderate fit screening guidelines. The results of these analyses serve only as estimates of potential selection rates in lieu of actual applicant data from ABC Company. A number of non-test factors, most notably the opportunity to take the assessment, affect selection rates. Table 8.4 shows the selection rates based on data from the ABC Company incumbent sample by demographic group, where males, White applicants, and applicants under 40 years of age are considered the majority groups. Table 8.5 presents the selection rates based on data from the Sales Representative and Specialist HPI archival sample. Based on the 80% rule-of-thumb, these findings suggest that the recommended cutoff scores should not result in adverse impact against any minority group.

Table 8.4 Effects of Applying Recommended HPI Cutoff Scores to the Incumbent Sample—Selection Rates and Adverse Impact Ratios by Demographic Group

		Fails to Meet Cuts		Meets Cuts		A.I. Ratio
		N	%	N	%	
Total		46	52.3%	42	47.7%	NA
Sex	Male	39	51.3%	37	48.7%	NA
	Female	7	58.3%	5	41.7%	SS
Age	Under 40	17	48.6%	18	51.4%	NA
	40 and Over	22	55.0%	18	45.0%	.88
Race	Black	2	40.0%	3	60.0%	SS
	Hispanic	3	33.3%	6	66.7%	SS
	Asian	1	100.0%	0	0.0%	SS
	Native American	4	44.4%	5	55.6%	SS
	White	17	50.0%	17	50.0%	NA

Note. A.I. = Adverse Impact; NA = Not Applicable.; SS = Sample Size Insufficient

Table 8.5 Effects of Applying Recommended HPI Cutoff Scores to the Archival Sample—Selection Rates and Adverse Impact Ratios by Demographic Group

		Fails to Meet Cuts		Meets Cuts		A.I. Ratio
		N	%	N	%	
Total		2,181	20.9%	8,251	79.1%	NA
Sex	Male	1,237	20.8%	4,706	79.2%	NA
	Female	102	18.2%	457	81.8%	1.03

Table 8.5 Effects of Applying Recommended HPI Cutoff Scores to the Archival Sample – Selection Rates and Adverse Impact Ratios by Demographic Group (continued)

		Fails to Meet Cuts		Meets Cuts		A.I. Ratio
		N	%	N	%	
Age	Under 40	905	19.5%	3,735	80.5%	NA
	40 and Over	329	24.5%	1,016	75.5%	.94
Race	Black	202	14.5%	1,191	85.5%	1.11
	Hispanic	60	16.0%	314	84.0%	1.09
	Asian	34	21.1%	127	78.9%	1.02
	Native American	41	18.4%	182	81.6%	1.06
	White	810	22.9%	2,724	77.1%	NA

Note. A.I. = Adverse Impact; NA = Not Applicable.

8.3 Pass-Plus Decision Guidelines. In addition to offering Moderate Fit candidate screening guidelines, Hogan also recommends pass-plus decision guidelines for selecting strong potential candidates into the Sales Representative job, as shown in Table 8.6. These High Fit candidate screening guidelines involve more stringent requirements on the scales comprising the Moderate Fit candidate screening guidelines as well as minimum requirements on scales identified as (a) predictive of specific Sales Representative performance domains and (b) capable of identifying candidates possessing work-related values consistent with ABC Company’s idealized Sales Representative work environment.

Collectively, the pass-plus (High Fit) guidelines will help ABC Company identify applicants who are likely to possess greater levels of characteristics most closely related to overall successful performance within Sales Representative jobs plus (a) characteristics related to being imaginative and resourceful problem solvers (Inquisitive) and (b) work-related values most consistent with ABC Company’s idealized work environment, which includes financial considerations (MVPI Commerce) and use and appreciation of concrete, measurable data (MVPI Science)

Note that the recommendations shown in Table 8.6 reflect guidelines only and should be used in conjunction with other available relevant information to screen otherwise qualified candidates.

Table 8.6 Recommended Pass-Plus Cutoff Scores

Scale	Low Fit	Moderate Fit	High Fit
HPI Adjustment		≥ 5%	≥ 5%
HPI Prudence		≥ 10%	≥ 15%
HPI Learning Approach	Fails to Meet Moderate Fit	≥ 10%	≥ 25%
HPI Inquisitive	Cutoff Scores		≥ 20%
MVPI Commerce			≥ 40%
MVPI Science			≥ 25%
Estimated Pass Rates based on U.S. General Normative Sample (N = 37,054)	15.7%	29.7%	54.6%
Estimated Pass Rates based on Incumbent Sample (N = 78)	43.6%	29.5%	26.9%

8.4 Uses and Applications. There is no indication that selection using the HPI and MVPI will result in adverse impact against any group. Therefore, because the two assessments are valid and do not discriminate unfairly, Hogan recommends that ABC Company administer both assessments to Sales Representative applicants and score the assessments using the recommended scales and cutoff scores shown in Table 8.6. Employment suitability should be determined, in part, by assessing scores on the recommended HPI and MVPI scales.

The following procedures will help ABC Company use and monitor the selection process. First, the applicant flow should be examined closely to determine if the recommended cutoff scores allow enough applicants to pass while screening out applicants who are likely to be poor performers. Cutoff scores on which everyone fails are just as ineffective as those on which everyone passes. Second, ABC Company should maintain records of test scores by demographic group, as indicated in the *Uniform Guidelines*, to monitor the possibility of adverse impact resulting from the use of the HPI. Third, the appropriate administrative personnel at ABC Company should review the entire selection process to determine if any procedures can be improved. This step should be taken after the selection process has been used for at least one year but not more than five years. Test validation experts recommend that the results obtained in a validation study should be reviewed and updated after five years (Schmit, Lundquest, & Beckham, 2008). Finally, performance appraisal and/or monitoring data should be maintained, if possible, on new incumbents who are hired using this selection procedure. These data will provide a check on the

validity of the selection procedure and will help determine utility. In addition, Hogan recommends conducting follow-up analyses on the people who were hired using the HPI and exploring the utility and bottom-line impact of the proposed selection system. For further information concerning this research or the results provided, please contact:

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

8.5 Accuracy and Completeness. Hogan completed all procedures within the requirements of both the *Uniform Guidelines* and the *Principles*. Hogan derived results strictly from data and archived study results and did not embellish, falsify, or alter results in any manner.

Hogan attests to the accuracy of the data collection, analysis, and reporting procedures used in this validity study. ABC Company collected job analysis data and sent the results to Hogan. Hogan entered the job analysis data into a database and computed results using SPSS/V.12.0 statistical software.

The process of establishing synthetic validity proceeded from a review of CET results to a review of the Hogan archive. Hogan searched the archive for studies including the CET dimensions deemed critical by SMEs ABC Company. Once identified, Hogan extracted the validity coefficient(s) and sample size(s) from each study and entered those data into an Excel spreadsheet. Hogan then computed the sample-weighted validity coefficients shown in this report.

9 –APPLICATION OF SELECTION PROFILE TO INCUMBENT DATA

To illustrate how the HPI and MVPI would work in practice, Hogan applied cutoff scores to the ABC Company incumbent sample. The following sections provide empirical evidence for the recommended profile.

9.1 Correlation Results. Hogan compared the recommended profile to the Overall Job Performance, 2008 Archival Appraisal, and Culture variables.

Table 9.1 Recommended Profile Correlations with Criterion

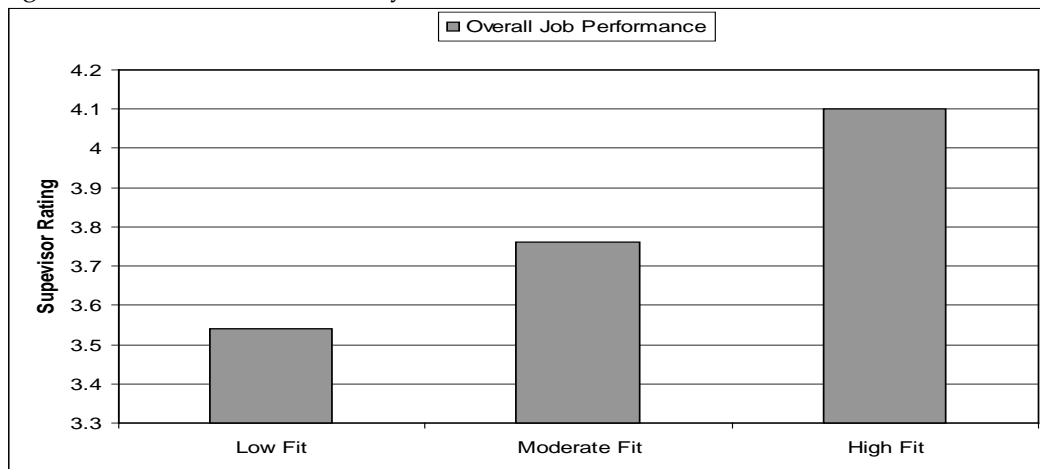
	Job Performance Rating	2008 Archival Appraisal	Culture Fit
Profile	0.22*	0.16	0.22*

Note. * = Significant at the .05 Level

As shown in Table 9.1, results indicate that the recommended profile positively correlates with job performance ratings, archival appraisal data, and supervisory ratings of culture fit.

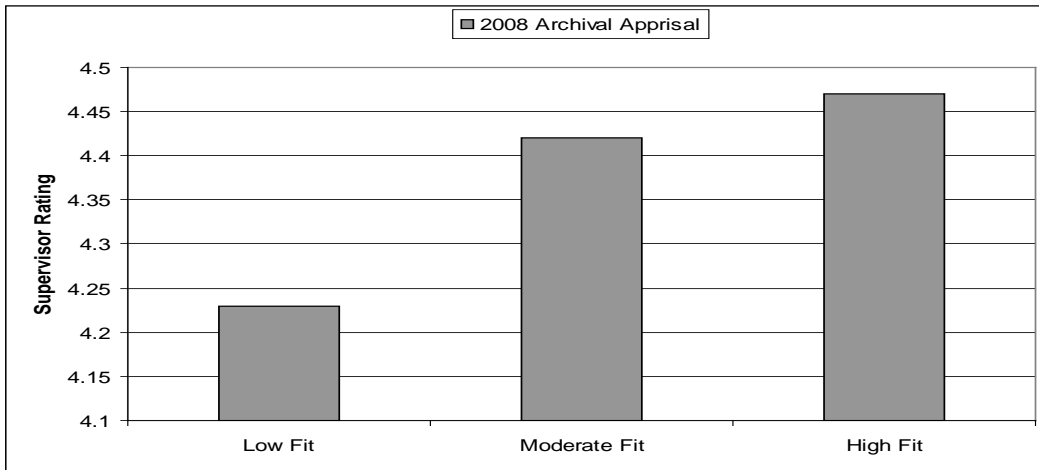
9.2 Mean Differences. As seen in Figure 9.1, Sales Representatives identified by the Hogan profile as moderate and high fit performers were, on average, rated higher than those indicated as low performers. Results indicate a significant, positive relationship ($r = .22$, $p = .05$) between the proposed profile and employee performance.

Figure 9.1 Overall Performance by Fit Level



Hogan examined the same results for supervisory ratings provided through ABC Company's internal appraisal process (see Figure 9.2).

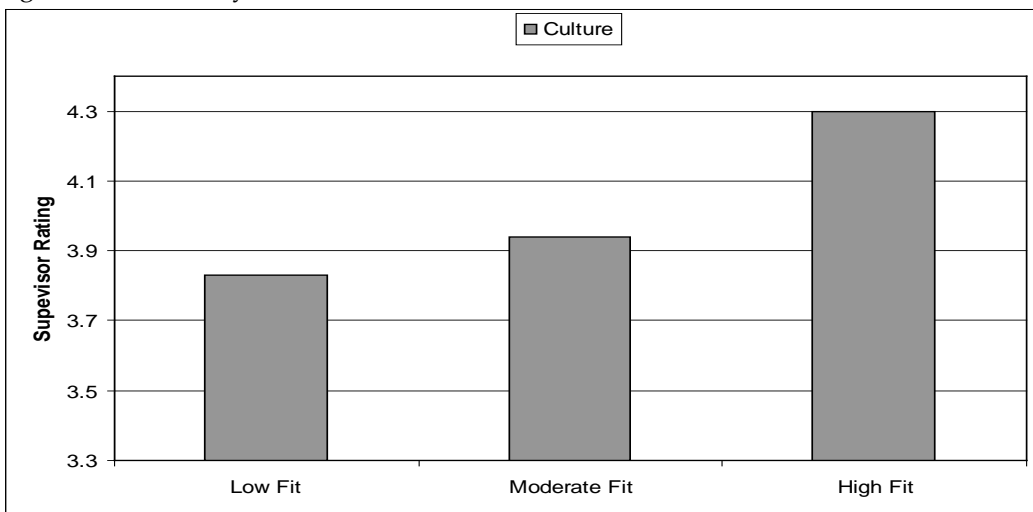
Figure 9.2 2008 Archival Appraisal by Fit Level



As seen in Figure 9.2, Sales Representatives identified by the Hogan profile as moderate and high fit performers were also rated higher than those indicated as low performers. Results indicate a positive relationship ($r = .16$).

Similarly, Hogan examined the same results for supervisory ratings of culture (see Figure 9.3).

Figure 9.3 Culture by Fit Level



As seen in Figure 9.3, Sales Representatives identified by the recommended profile as high fit performers were rated as a better fit with the company's

culture than those indicated as low performers. Results indicate a significant, positive relationship ($r = .22, p = .05$).

9.3 Odds Ratios. To obtain more interpretive information about results, Hogan computed odds ratios. Odds ratios represent a way of comparing the probability of an event for two different groups. Compared with other methods, odds ratios have two major advantages: (a) they are unaffected by sample size, and (b) they are unaffected by unequal row or column totals.

Hogan calculated odds ratios in a three-step process: (a) multiplying the true positives and true negatives, (b) multiplying the false positives and false negatives, and (c) dividing true hits (true positives * true negatives) by false hits (false positives * false negatives).

Odds ratios are interpreted by comparing their values to 1. Specifically, values smaller than 1.0 indicate a negative relationship, whereas values greater than 1.0 indicate a positive relationship. The farther away the odds ratio is from 1.0 indicates the strength of the relationship.

Hogan compared incumbents who fit the proposed profile to incumbents who did not fit the proposed profile on overall job performance, archival appraisal ratings, and culture fit.

9.4 Odds Ratios - Moderate Fit Profile. Hogan coded incumbents based on if they met the first-level cutoff scores of the proposed HPI/MVPI profile (i.e., Moderate Fit cutoff scores). In addition, we coded incumbents as above or below average performers based on the three primary indicators of job performance (i.e., Overall Job Performance, 2008 Archival Appraisal, and Culture).

We calculated odds ratios to determine the proportion of high versus low performers selected using the proposed profile by dividing the proportion of high performers selected by the proportion of low performers selected. Tables 9.2 – 9.4 provide these results.

Table 9.2 Application of Moderate Fit Profile on Overall Job Performance

Actual Performance	Selection Outcome		Total	Odds Ratio
	Reject	Accept		
Low Performance	27	31	58	
High Performance	7	13	20	1.62
Total	34	44	78	

Note. Actual Performance = supervisor ratings of employee performance; Selection outcome = recommended hiring decision for each employee

Based on overall job performance ratings, individuals meeting the profile were one and a half times more likely to be rated as a strong performer compared to those not meeting the profile.

Table 9.3 Application of Moderate Fit Profile on 2008 Archival Appraisals

Actual Performance	Selection Outcome		Total	Odds Ratio
	Reject	Accept		
Low Performance	18	21	39	
High Performance	16	23	39	1.23
Total	34	44	78	

Note. Actual Performance = supervisor ratings of employee performance; Selection outcome = recommended hiring decision for each employee

Based on 2008 archival appraisals, individuals meeting the profile were 1.2 times more likely to be rated as a strong performer compared to those not meeting the profile.

Table 9.4 Application of Moderate Fit Profile on Culture

Actual Performance	Selection Outcome		Total	Odds Ratio
	Reject	Accept		
Low Performance	8	6	14	
High Performance	26	38	64	1.95
Total	34	44	78	

Note. Actual Performance = supervisor ratings of employee performance.
Selection outcome = recommended hiring decision for each employee

Individuals meeting the profile were twice as likely to be rated as a good fit with the company's culture compared to those not meeting the profile.

9.5 Odds Ratios - High Fit Profile. Hogan coded incumbents based on whether or not they met the second-level cutoff scores of the proposed HPI/MVPI profile (i.e., High Fit cutoff scores). In addition, we coded incumbents as above or below average performers based on three primary indicators of overall job performance (i.e., Overall Job Performance, 2008 Archival Appraisal, and Culture). We calculated odds ratios to determine the proportion of high versus low performers selected using the proposed profile. Tables 9.5 - 9.7 provide these results.

Table 9.5 Application of High Fit Profile on Overall Job Performance

Actual Performance	Selection Outcome		Total	Odds Ratio
	Reject	Accept		
Low Performance	46	12	58	
High Performance	11	9	20	3.10
Total	57	21	78	

Note. Actual Performance = supervisor ratings of employee performance.
 Selection outcome = recommended hiring decision for each employee

Based on overall job performance ratings, individuals meeting the high fit profile were three times more likely to be rated as a strong performer compared to those not meeting the profile.

Table 9.6 Application of High Fit Profile on 2008 Archival Appraisals

Actual Performance	Selection Outcome		Total	Odds Ratio
	Reject	Accept		
Low Performance	29	10	39	
High Performance	28	11	39	1.14
Total	57	21	78	

Note. Actual Performance = supervisor ratings of employee performance.
 Selection outcome = recommended hiring decision for each employee

Based on 2008 archival appraisals, individuals meeting the profile were 1.1 times more likely to be rated as a strong performer compared to those not meeting the profile.

Table 9.7 Application of High Fit Profile on Culture

Actual Performance	Selection Outcome		Total	Odds Ratio
	Reject	Accept		
Low Performance	12	2	14	
High Performance	45	19	64	2.53
Total	57	21	78	

Note. Actual Performance = supervisor ratings of employee performance.
 Selection outcome = recommended hiring decision for each employee

Individuals meeting the profile were 2.5 more likely to be rated as a good fit with the company's culture compared to those not meeting the profile.

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APPENDIX A: Sales Representative Job Description

REMEC TITLE: Engineer, Associate I

BENCHMARK TITLE:

RADFORD CODE:

ORC/SIRS CODE:

DIVISION:

GRADE:

FLSA:

LABOR CATEGORY:

W/C CODE:

EEO CATEGORY:

WORK ENVIRONMENT:

REPORTS TO: Product Line Manager, Director of Engineering or Program Manager (MMIC)

MAIN PURPOSE OF JOB (Brief Summary)

This position will sustain RF/Microwave assemblies per customer defined specifications, and may participate in some limited RF design activity as part of working with these assemblies. Will spend the majority of time in the lab optimizing, prototyping, and tuning RF/Microwave assemblies. Assist the Responsible Engineer in production transfers, circuit optimizations, documentation, and test procedures.

MAIN JOB DUTIES/RESPONSIBILITIES

- Test, tune, debug, and optimize prototype circuits and components to meet specification requirements and manufacturing productability requirements under the direction of the Responsible Engineer (RE).
- Interpret specifications and procedures and apply to current design
- Evaluate and validate electrical circuits, components, and IMA's including, parts/materials and process selection.
- Participate with RF Design engineers, designers, and drafters in project related documentation.
- Assist the Responsible Engineer in the generation of test procedures (ATPs) and test reports.
- Transfer the test, tune, debug, and optimization knowledge of new designs to manufacturing Sales Representatives..
- Perform and coordinate production engineering support function, including fixture, material, design, process problem evaluation and solution

APPENDIX A: Sales Representative Job Description (Continued)

- Participate in safety training and actively comply with safety policies and practices.
- Actively support Lean initiatives by attending training where applicable, participating in Lean activities (5S, Kaizen, problem solving, error proofing), making suggestions for improvements and sustaining improvements implemented.
- Actively participate in team meetings and activities, including SET team support as appropriate.

KNOWLEDGE/SKILLS/ABILITIES

- Communication skills sufficient to read and interpret documents such as detailed technical specifications, procedural instructions and task lists. Ability to write routine reports and correspondence. Ability to speak effectively to employees of the organization during departmental meetings and required training classes
- Math skills sufficient to calculate figures and amounts such as discount, interest, commissions, proportions, percentages, area, circumference, and volume. Ability to apply concepts of basic algebra and geometry.
- Reasoning skills sufficient to apply common sense understanding to carry out instructions furnished in written, oral, or diagram form. Ability to deal with problems involving several concrete variables in standardized situations.
- Must be able to work as part of a team and coordinate with other employees as required
- Familiar with the theoretical and mathematical aspects of electrical engineering
- Good RF/Microwave circuit trouble shooting skills
- Good working knowledge of RF/Microwave test equipment and procedures.

EDUCATION

- Associates Degree or equivalent military training in Electronics or Engineering or related field

JOB EXPERIENCE

- Knowledge and skills typically gained through 7 - 10 years as an RF/Microwave Sales Representative, preferably in a military products environment; or equivalent combination of education and experience.

CERTIFICATIONS AND TRAINING REQUIREMENTS:

Required to possess following certifications:

- N/A

Required to obtain the following:

- LEAN Energizing Attendance

APPENDIX A: Sales Representative Job Description (Continued)

- ESD Awareness

May be required to obtain the following:

- PS618, PS1725, PS130

Required to obtain at least 1 of the following

- N/A

SECURITY

- Required to obtain and maintain a security clearance, which requires US Citizenship.

The above information on this description has been designed to indicate the general nature and level of work performed by employees within this classification. It is not designed to contain or be interpreted as a comprehensive inventory of all duties, responsibilities and qualifications required of employees assigned to this job.

The accuracy of this document is not guaranteed unless obtained through the Human Resources Department or their resources (i.e. HR sites on CREW). Copies obtained through other sources may not be the most current version.

APPENDIX A: Sales Representative Job Description (Continued)

REMEC TITLE: Engineer, RF I
BENCHMARK TITLE:
RADFORD CODE:
ORC/SIRS CODE:
DIVISION:
GRADE:
FLSA:
LABOR CATEGORY:
W/C CODE:
EEO CATEGORY:
WORK ENVIRONMENT:
REPORTS TO: Product Line Manager

MAIN PURPOSE OF JOB (Brief Summary)

This position serves as entry level into the REMEC RF/Microwave electrical design field in which critical experience is gained through comprehensive support roles in all areas of design, manufacturing and production. Primary role will be to support sustaining engineering of basic through medium-complexity of integrated microwave assemblies through the tuning/testing/optimization of RF/Microwave circuits, assisting in electrical and mechanical design, and generating complete drawing packages, including testing procedures.

MAIN JOB DUTIES/RESPONSIBILITIES

- Evaluate specifications and generate testing procedures.
- Assist in the design of RF/Microwave circuits including amplifiers, mixers, switches, filters and oscillators, component identification, and subsystem definition including computer/mathematical modeling, part/material/process selection and mechanical layout and packaging.
- Perform circuit and reliability analysis
- Coordinate with mechanical engineers, designers, and drafters to produce mechanical design and drawing packages under guidance of the Responsible Engineer.
- Test, tune, debug, and optimize prototype circuits and components to meet specification requirements and manufacturing producibility requirements
- Guides Sales Representatives on test, tune, debug, and optimization of prototype circuits and components

-

APPENDIX A: Sales Representative Job Description (Continued)

- Assist in the organization and scheduling of development projects, including the following activities: process development, fixture design and implementation, material procurement and customer interface meetings (design reviews)
- Perform and coordinate production engineering support function, including fixture, material, design, process problem evaluation and solution
- Participate in safety training and actively comply with safety policies and practices.
- Actively support Lean initiatives by attending training where applicable, participating in Lean activities (5S, Kaizen, problem solving, error proofing), making suggestions for improvements and sustaining improvements implemented.
- Actively participate in team meetings and activities, including SET team support as appropriate.

KNOWLEDGE/SKILLS/ABILITIES

- Must have excellent oral and written English communication skills sufficient enough to understand verbal and written instructions, communicate with other employees, customers, and suppliers, follow prescribed directions and tasks lists, and participate in departmental team meetings and required training classes
- Able to work as part of a team and coordinate with other employees as required
- Theoretical and mathematical electrical engineering knowledge
- Strong analytical and problem-solving skills
- Experience with the use of RF circuit simulators (MWO preferred)
- Experience with the use of Microsoft Office (Excel, Word, Powerpoint)

EDUCATION

- Bachelor's Degree in Electrical Engineering (BSEE) or related field
- Must have taken RF/Microwave and electromagnetism courses and labs

JOB EXPERIENCE

- Knowledge typically gained through 0 to 2 years of related experience

CERTIFICATIONS AND TRAINING REQUIREMENTS:

Required to possess following certifications (or obtain within 3 months of hire if new employee):

- PS618, PS130, PS1725

Required to obtain the following:

- LEAN Energizing Attendance
- ESD Awareness

APPENDIX A: Sales Representative Job Description (Continued)

May be required to obtain the following:

-

Required to obtain at least 1 of the following

- Re Training Course

SECURITY

- Required to obtain and maintain a security clearance, which requires US Citizenship.

The above information on this description has been designed to indicate the general nature and level of work performed by employees within this classification. It is not designed to contain or be interpreted as a comprehensive inventory of all duties, responsibilities and qualifications required of employees assigned to this job.

APPENDIX B: The Job Evaluation Tool (JET)

Introduction

The Job Evaluation Tool (JET) is a job analysis system designed to identify personal characteristics and competencies required by jobs. Different jobs require different personality characteristics, work preferences, and competencies for successful performance. The JET provides a systematic way for job experts to describe a job and to compare it to other jobs. The four sections of this job analysis are worker-based with a focus on identifying specific personality, motivational, and behavioral competencies necessary for job success. Results from the JET are used for a variety of human resource purposes including identifying and developing job-related assessments, matching people to jobs and work groups, and defining the personal characteristics needed for jobs of the future.

Subject Matter Expert Qualifications

Please provide the information requested below. Your qualifications and responses are confidential. All data are for research purposes only. Your responses will be combined with other experts' responses to create an overall job profile for the job in question.

About your organization:

1. TITLE OF THE JOB YOU ARE EVALUATING: _____
2. Your organization's name: _____

About you:

1. Your current job title: _____
2. Your name: _____
3. ID number: _____
4. Race/Ethnicity: ___White ___African American ___Hispanic ___Other (specify)_____
5. Gender: ___Male ___Female
6. Have you worked in the job you are evaluating as a(n):

<u>Position</u>	<u>Yes/No</u>	<u>Years of Experience</u>
Incumbent	_____	_____
Supervisor/Manager	_____	_____
Trainer	_____	_____
Recruiter	_____	_____
HR Specialist	_____	_____
Other (specify) _____	_____	_____

7. How confident are you in the level of knowledge you have about the job you are evaluating?
____Not at all ___Not very ___Somewhat ___Very ___Extremely

Please complete the sections of the JET, which appear on the following pages.

Thank you for your participation.

APPENDIX B: The Job Evaluation Tool (JET) (Continued)

JOB CHARACTERISTICS

INSTRUCTIONS

Below is a list of behavioral characteristics. Please rate the extent to which each characteristic would **IMPROVE** the performance of a _____. Try to work quickly. Do not spend too much time thinking about any single item. Please mark your responses in the bubbles provided.

Does Not Improve Performance	Minimally Improves Performance	Moderately Improves Performance	Substantially Improves Performance
0	1	2	3

*Would job performance **IMPROVE** if a _____.....?*

- | | <u>Rating</u> | | <u>Rating</u> |
|-----------------------------------------------------------------|---------------|----------------------------------------------------------|---------------|
| 1. Is steady under pressure _____ | ⓪ ① ② ③ | 25. Is kind and considerate _____ | ⓪ ① ② ③ |
| 2. Is not easily irritated by others _____ | ⓪ ① ② ③ | 26. Understands others' moods _____ | ⓪ ① ② ③ |
| 3. Is relaxed and easy-going _____ | ⓪ ① ② ③ | 27. Likes being around other people _____ | ⓪ ① ② ③ |
| 4. Doesn't worry about his/her past mistakes _____ | ⓪ ① ② ③ | 28. Is good-natured - not hostile _____ | ⓪ ① ② ③ |
| 5. Stays calm in a crisis _____ | ⓪ ① ② ③ | 29. Is self-controlled and conscientious _____ | ⓪ ① ② ③ |
| 6. Rarely loses his/her temper _____ | ⓪ ① ② ③ | 30. Supports the organization's values _____ | ⓪ ① ② ③ |
| 7. Doesn't complain about problems _____ | ⓪ ① ② ③ | 31. Is hard-working _____ | ⓪ ① ② ③ |
| 8. Trusts others – is not suspicious _____ | ⓪ ① ② ③ | 32. Does as good a job as possible _____ | ⓪ ① ② ③ |
| 9. Gets along well with supervisors and authority figures _____ | ⓪ ① ② ③ | 33. Pays attention to feedback _____ | ⓪ ① ② ③ |
| 10. Takes initiative – solves problems on his/her own _____ | ⓪ ① ② ③ | 34. Likes predictability at work _____ | ⓪ ① ② ③ |
| 11. Is competitive _____ | ⓪ ① ② ③ | 35. Rarely deviates from standard procedures _____ | ⓪ ① ② ③ |
| 12. Is self-confident _____ | ⓪ ① ② ③ | 36. Respects authority _____ | ⓪ ① ② ③ |
| 13. Is positive _____ | ⓪ ① ② ③ | 37. Is imaginative and open-minded _____ | ⓪ ① ② ③ |
| 14. Takes charge of situations _____ | ⓪ ① ② ③ | 38. Is interested in science _____ | ⓪ ① ② ③ |
| 15. Has clear career goals _____ | ⓪ ① ② ③ | 39. Is curious about how things work _____ | ⓪ ① ② ③ |
| 16. Enjoys speaking in front of groups _____ | ⓪ ① ② ③ | 40. Likes excitement _____ | ⓪ ① ② ③ |
| 17. Seems to enjoy social interaction _____ | ⓪ ① ② ③ | 41. Enjoys solving problems and puzzles _____ | ⓪ ① ② ③ |
| 18. Likes social gatherings _____ | ⓪ ① ② ③ | 42. Generates good ideas and solutions to problems _____ | ⓪ ① ② ③ |
| 19. Likes meeting strangers _____ | ⓪ ① ② ③ | 43. Likes cultural activities _____ | ⓪ ① ② ③ |
| 20. Needs variety at work _____ | ⓪ ① ② ③ | 44. Keeps up on advances in their profession _____ | ⓪ ① ② ③ |
| 21. Wants to be the center of attention _____ | ⓪ ① ② ③ | 45. Likes to learn new things–enjoys training _____ | ⓪ ① ② ③ |
| 22. Is witty and entertaining _____ | ⓪ ① ② ③ | 46. Is good with numbers _____ | ⓪ ① ② ③ |
| 23. Is warm and friendly _____ | ⓪ ① ② ③ | 47. Remembers details _____ | ⓪ ① ② ③ |
| 24. Is tolerant (not critical or judgmental) _____ | ⓪ ① ② ③ | 48. Reads in order to stay informed _____ | ⓪ ① ② ③ |

APPENDIX B: The Job Evaluation Tool (JET) (Continued)

WORK PREFERENCES

INSTRUCTIONS

Below is a list of work preferences. Please rate the extent to which each characteristic listed below **DESCRIBES** the _____ work group (s) in your organization. The work group consists of those individuals who hold positions with the specified job title and their immediate supervisor, all of whom work together. Try to work quickly. Do not spend too much time thinking about any single item. Please mark your responses in the bubbles provided.

Does Not Describe the Work Group	Minimally Describes the Work Group	Moderately Describes the Work Group	Substantially Describes the Work Group
0	1	2	3

The _____ work group(s) in our organization...

- | | | | | | | | | | |
|-----------------------------------------------------------------------------------|---|---|---|---|--------------------------------------------------------------|---|---|---|---|
| 1. Focus on bottom-line results _____ | ⓪ | ① | ② | ③ | 21. Avoid taking risky actions _____ | ⓪ | ① | ② | ③ |
| 2. Monitor budgets and spending closely _____ | ⓪ | ① | ② | ③ | 22. Analyze the risk involved before making a decision _____ | ⓪ | ① | ② | ③ |
| 3. Set clear financial goals for the work group _____ | ⓪ | ① | ② | ③ | 23. Seem concerned about job security _____ | ⓪ | ① | ② | ③ |
| 4. Evaluate staff needs in financial terms _____ | ⓪ | ① | ② | ③ | 24. Hate making mistakes _____ | ⓪ | ① | ② | ③ |
| 5. Do things to improve the appearance of offices and facilities _____ | ⓪ | ① | ② | ③ | 25. Enjoy meeting new people _____ | ⓪ | ① | ② | ③ |
| 6. Care about the appearance of company work products and work spaces _____ | ⓪ | ① | ② | ③ | 26. Enjoy social interaction at work _____ | ⓪ | ① | ② | ③ |
| 7. Work to improve the appearance of our marketing and advertising material _____ | ⓪ | ① | ② | ③ | 27. Enjoy holding meetings _____ | ⓪ | ① | ② | ③ |
| 8. Insist that equipment is clean and attractive _____ | ⓪ | ① | ② | ③ | 28. Enjoy spending time with the staff _____ | ⓪ | ① | ② | ③ |
| 9. Look for ways to apply new technology in the workplace _____ | ⓪ | ① | ② | ③ | 29. Like being the center of attention _____ | ⓪ | ① | ② | ③ |
| 10. Use data to forecast business trends _____ | ⓪ | ① | ② | ③ | 30. Talk about their achievements _____ | ⓪ | ① | ② | ③ |
| 11. Use data to evaluate financial performance _____ | ⓪ | ① | ② | ③ | 31. Try to impress others _____ | ⓪ | ① | ② | ③ |
| 12. Troubleshoot systems and business processes _____ | ⓪ | ① | ② | ③ | 32. Tend to show off _____ | ⓪ | ① | ② | ③ |
| 13. Encourage and support poor performers _____ | ⓪ | ① | ② | ③ | 33. Want to beat the competition _____ | ⓪ | ① | ② | ③ |
| 14. Show sympathy for those with personal problems _____ | ⓪ | ① | ② | ③ | 34. Are persistent in achieving goals _____ | ⓪ | ① | ② | ③ |
| 15. Believe everyone should have an equal opportunity for advancement _____ | ⓪ | ① | ② | ③ | 35. Take the initiative to solve problems _____ | ⓪ | ① | ② | ③ |
| 16. Put the needs of others above their own _____ | ⓪ | ① | ② | ③ | 36. Establish high standards for performance _____ | ⓪ | ① | ② | ③ |
| 17. Are strict about matters of right and wrong _____ | ⓪ | ① | ② | ③ | 37. Enjoy having a good time _____ | ⓪ | ① | ② | ③ |
| 18. Support family values _____ | ⓪ | ① | ② | ③ | 38. Like to entertain clients and customers _____ | ⓪ | ① | ② | ③ |
| 19. Are concerned about moral and ethical matters _____ | ⓪ | ① | ② | ③ | 39. Make the workplace fun _____ | ⓪ | ① | ② | ③ |
| 20. Seem to have old-fashioned or "old school" values _____ | ⓪ | ① | ② | ③ | 40. Organize special events and holiday parties _____ | ⓪ | ① | ② | ③ |

APPENDIX B: The Job Evaluation Tool (JET) (Continued)

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.

<u>Not Associated</u> with Job Performance	<u>Minimally</u> Concerned with Job Performance	<u>Helpful</u> for Job Performance	<u>Important</u> for Job Performance	<u>Critical</u> for Job Performance
0	1	2	3	4
<u>Competency</u>	<u>Definition</u>	<u>Rating</u>		
1. Stress Tolerance	Handles pressure without getting upset, moody, or anxious _____	Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ		
2. Work Attitude	Has a positive attitude toward work _____	Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ		
3. Achievement Orientation	Strives to meet and exceed goals for self and others _____	Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ		
4. Initiative	Takes action before being told what to do _____	Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ		
5. Leadership	Provides direction and motivates others to work for a common goal _____	Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ		
6. Customer Service	Provides courteous and helpful service to customers and associates _____	Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ		
7. Interpersonal Skills	Gets along well with others, is tactful, and behaves appropriately in social situations _____	Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ		
8. Teamwork	Works well in groups and is a good team player _____	Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ		
9. Integrity	Follows rules and is a good organizational citizen _____	Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ		
10. Trustworthiness	Is honest and trustworthy _____	Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ		
11. Detail Orientation	Performs work with great care and accuracy over a period of time _____	Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ		
12. Safety	Follows safety precautions and displays safe on-the-job behavior _____	Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ		
13. Planning/Organizing	Plans work to maximize efficiency (in time and resources) and minimize downtime _____	Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ		
14. Dependability	Performs work in a consistent and timely manner _____	Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ		
15. Decision-Making	Evaluates issues and uses sound reasoning to make decisions _____	Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ		
16. Problem Solving	Identifies and implements effective solutions to problems _____	Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ		
17. Teaching Others	Provides training for others _____	Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ		
18. Math Skills	Uses mathematics appropriately to answer questions or solve problems _____	Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ		
19. Job Knowledge	Understands all aspects of the job _____	Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ		
20. Training Performance	Performs well in job training sessions or courses _____	Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ		
21. Conflict Resolution	Resolves interpersonal problems and disputes with tact and decisiveness _____	Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ		
22. Organizational Commitment	Shows dedication and loyalty to his/her company _____	Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ		
23. Citizenship	Represents the company favorably to outsiders _____	Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ		
24. Flexibility	Adapts quickly to changing circumstances and is willing to try new methods _____	Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ		
25. Management Performance	Coordinates resources to maximize productivity and efficiency _____	Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ		
26. Industry Knowledge	Understands the industry and its emerging trends _____	Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ		
27. Influence	Provides effective rationale to support own opinion and ideas _____	Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ		
28. Employee Development	Provides support and career direction to peers and subordinates _____	Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ		

APPENDIX B: The Job Evaluation Tool (JET) (Continued)

JOB COMPETENCIES (continued)

<u>Not Associated</u> with Job Performance	<u>Minimally</u> Concerned with Job Performance	<u>Helpful</u> for Job Performance	<u>Important</u> for Job Performance	<u>Critical</u> for Job Performance
0	1	2	3	4
<u>Competency</u>	<u>Definition</u>	<u>Rating</u>		
29. Strategic Vision	Understands and talks about the big picture _____	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 _____	① ② ③ ④		
31. Oral Communication	Conveys information clearly and expresses self well in conversations _____	① ② ③ ④		
32. Written Communication	Writes clearly and concisely _____	① ② ③ ④		
33. Technical Knowledge	Uses existing technology and considers the use of new technology to increase productivity _____	① ② ③ ④		
34. Adaptability	Is able to change directions quickly and work without explicit guidance _____	① ② ③ ④		
35. Delegation	Assigns work to others based on their skills and future development needs _____	① ② ③ ④		
36. Negotiation	Explores alternatives to reach outcomes acceptable to all parties _____	① ② ③ ④		
37. Impact	Creates a good first impression and commands attention and respect _____	① ② ③ ④		
38. Information Monitoring	Sets up procedures to collect information needed to manage activities _____	① ② ③ ④		
39. Building Strategic Work Relationships	Develops collaborative relationships to facilitate the accomplishment of work goals _____	① ② ③ ④		
40. Innovation	Finds innovative solutions to problems at work _____	① ② ③ ④		
41. Gaining Commitment	Uses appropriate methods to gain acceptance of ideas or plans _____	① ② ③ ④		
42. Facilitating Change	Encourages others to find or adopt innovative solutions _____	① ② ③ ④		
43. Risk Taking	Takes chances to achieve goals while considering possible negative consequences _____	① ② ③ ④		
44. Verbal Direction	Listens to and follows verbal directions from others _____	① ② ③ ④		
45. Data Entry	Ensures high quality data entry by balancing the needs for speed and accuracy _____	① ② ③ ④		
46. Vigilance	Remains watchful and alert while performing monotonous tasks _____	① ② ③ ④		
47. Consultative Sales	Develops understanding of client history and goals in order to offer needed services _____	① ② ③ ④		
48. Facilitative Sales	Uses detailed product knowledge to facilitate the sale of products and services _____	① ② ③ ④		
49. Building Partnerships	Builds strategic relationships to help achieve business goals _____	① ② ③ ④		
50. Building Teams	Uses appropriate methods to build a cohesive team _____	① ② ③ ④		
51. Formal Presentation	Presents ideas effectively to individuals or groups _____	① ② ③ ④		
52. Sales Ability	Uses appropriate interpersonal styles and communication methods to sell products or services _____	① ② ③ ④		
53. Continuous Learning	Actively identifies new areas for personal learning _____	① ② ③ ④		
54. Follow-Up	Monitors the results of work assigned to others _____	① ② ③ ④		
55. Meeting Participation	Is an active participant during meetings _____	① ② ③ ④		
56. Meeting Leadership	Ensures that meetings accomplish their business objectives _____	① ② ③ ④		

APPENDIX C: Supervisor Rating Form

The purpose of this form is to gather performance ratings for current Sales Representatives at ABC Company. This information will be used to customize our new selection program for this position. Your honest responses will assist us in creating a stronger hiring program, which in turn will continue to enhance the quality and productivity of your workplace.

These ratings will be used solely for the purpose of research, and will not be seen by anyone but the research team at Hogan Assessment Systems. This information will be treated confidentially, and will not affect the employee's compensation, employment status, or any other personnel action.

You are asked to provide information about the employee that you are rating based on your knowledge of the employee's job performance. Please make your selections using the rating scales provided. To ensure the ratings you provide are as accurate as possible, we ask that you keep the following in mind:

- Rate the employee according to his/her typical performance on the job. Do not let your ratings be overly influenced by exceptionally good or bad incident.
- Remember that an employee may perform well in one aspect of job performance and poorly in another. In addition, it is unlikely that any employee will be "in the middle" on most or all items.
- Do not let unrelated personal opinions influence your ratings. The goal is to provide accurate ratings that are based only on the employee's job performance.

Please Note: There is a Ratings tab shown below containing performance rating exercises for you to complete. It is very important that you complete all of the exercises. This task should only take ~30 minutes of your time.

Ratings Tab: In the Ratings tab, please rate each employee on individual dimensions found to be important for successful job performance on the job.

Once you complete the Ratings tab, please save this file and email the file to Matt Lemming at Hogan Assessment Systems (mlemming@hoganassessments.com)

Supervisor Name:

Thank you for your assistance.

APPENDIX C: Supervisor Rating Form (Continued)

Section 1: Review each dimension of job performance

Job Performance Dimension	Definition
Problem Solving	Identifies and implements effective solutions to problems
Job Knowledge	Understands all aspects of the job
Planning/Organizing	Schedules activities to maximize efficiency
Achievement Orientation	Demonstrates drive and determination
Flexibility	Adapts quickly to changes in demands or priorities
Verbal Direction	Listens to and follows directions from others
Detail Orientation	Performs work with great care and accuracy over a period of time
Judgment	Evaluates issues and uses sound reasoning to make decisions
Dependability	Performs work in a consistent and timely manner
Employee Engagement	Appears actively engaged and involved in his/her work
Job Satisfaction	Appears to look forward to and enjoy coming to work
Culture	Daily work fits well with company's culture
Overall Job Performance	Performs work at a high level and is seen as a role model for other workers

Section 2: Review the rating scale

<u>Almost Never</u>	<u>Rarely</u>	<u>Sometimes</u>	<u>Almost Always</u>	<u>Always</u>
Exhibits this behavior	Exhibits this behavior	Exhibits this behaviors	Exhibits this behavior	Exhibits this behavior

Section 3: Rate each employee (1 to 5) on all ten job performance dimensions using the scale above.

APPENDIX D: Archival Appraisal Rating Form

Non-Exempt Position Review

Employee Name: _____	Emp#: _____
Supervisor: _____	Dept#: _____
Employee Title: _____	Hire Date: _____
Review Due Date: _____	Review Date: _____

PART I – Performance Assessment

Check the rating that most accurately describes that employee's performance in the selected area. Include examples below to illustrate your evaluation, particularly in the "Exceeds Expectations" and "Requires Improvement" areas. Attach additional sheets as necessary.

1. Quality of Work: To what extent is the employee's work accurate, complete and free of errors? Does employee understand and participate in activities designed to improve quality and understand the needs and standards of internal and external customers?					
Exceeds Expectations		Meets Expectations		Requires improvement	
<input type="checkbox"/> 6	<input type="checkbox"/> 5	<input type="checkbox"/> 4	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1
Rejects and errors are rare. Errors that do occur are not repeated and total cost impact is minimal. Participates actively in the improvement of quality systems and error-proofing processes. Does not pass on defective product.		Errors may occur but are usually due to employee unfamiliarity associated with learning curve. Generates occasional rework or loss. May make occasional suggestions for process improvements.		Lacks accuracy, makes frequent or high impact errors; work frequently requires rework. Does not actively participate in quality process improvement activities.	
Examples of quality of work:					
Behaviors and development objectives that would improve the current rating or maintain an Excellent rating:					

2. Quantity of Work: To what extent does the employee complete work within the required performance standards (speed, expected completion time frames, expected output)?					
Exceeds Expectations		Meets Expectations		Requires improvement	
<input type="checkbox"/> 6	<input type="checkbox"/> 5	<input type="checkbox"/> 4	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1
The employee consistently and significantly exceeds expectations of the job, producing more than expected, exceeding ETCs and/or completing projects before deadlines.		The employee fulfills expectations, producing output and results as required by position and within expected timeframes.		The employee's performance frequently falls below expectations. Output is below requirements or deadlines are missed.	
Examples of quantity:					
Behaviors and development objectives that would improve the current rating or maintain an Excellent rating:					

APPENDIX D: Archival Appraisal Rating Form (Continued)

3. Job Knowledge: To what extent does the employee understand the principles, methods, processes and procedures used in assignment; is able to apply them and make good decisions and accomplish job responsibilities; and can transfer knowledge to new assignments or environments?

Exceeds Expectations		Meets Expectations		Requires improvement	
<input type="checkbox"/> 6	<input type="checkbox"/> 5	<input type="checkbox"/> 4	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1
Thoroughly understands all aspects of the job and makes the most of knowledge and experience. Makes sound and resourceful decisions in the absence of detailed instructions. Adjusts quickly to new conditions. Needs little direction and is willing and able to share knowledge with others.		Understands the basic job objectives and demonstrates knowledge of most practices and procedures. Can make sound decisions as needed. Sometimes needs instruction on new assignments and activities.		Insufficient knowledge of job; requires frequent help or repeated directions. Has trouble adjusting to new conditions or transferring knowledge to new tasks. May make poor judgment calls due to insufficient job understanding.	
Examples of job knowledge:					
Behaviors and development objectives that would improve the current rating or maintain an Excellent rating:					

4. Accountability, Focus and Consistency: To what extent does the employee meet commitments, deadlines, and adherence to company guidelines? Is the employee accountable and rises above circumstance to achieve results? To what extent does employee's attendance impact his/her ability to meet commitments and deadlines as required.

Exceeds Expectations		Meets Expectations		Requires improvement	
<input type="checkbox"/> 6	<input type="checkbox"/> 5	<input type="checkbox"/> 4	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1
Can always be counted on to be meet deadlines and commitments. Proactive in addressing barriers to on-time completion. Rises above circumstances to produce extraordinary results.		Generally meets due dates or takes appropriate action if deadline may be missed. Takes responsibility for actions without excuses, and moves forward with solutions.		Misses due dates on projects without appropriate actions taken. Tends to focus on old explanations and excuses, react to problems and fails to take full responsibility.	
Examples of accountability, focus and consistency:					
Behaviors and development objectives that would improve the current rating or maintain an Excellent rating:					

5. Teamwork and Cooperation: To what extent does the employee support team goals, establish effective working relationships, interact positively with peers and avoid downward spirals. Consider optional activities such as SET team leadership, participation in employee services, employee recognition, Excellence ambassadors or other team activities.

Exceeds Expectations		Meets Expectations		Requires improvement	
<input type="checkbox"/> 6	<input type="checkbox"/> 5	<input type="checkbox"/> 4	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1
Very positive team player, follows "Mine the Gold" Excellence principle to bring out the best in self and others; recognizes the value in every person's contribution.		Cooperates fully and supports team goals. Makes suggestions and constructively participates in team meetings.		May be uncooperative or negative when working with others. Does not participate actively in team meetings. Does not follow Excellence principles and Code of Conduct.	
Examples of teamwork and cooperation:					
Behaviors and development objectives that would improve the current rating or maintain an Excellent rating:					

APPENDIX D: Archival Appraisal Rating Form (Continued)

6. Communication: To what extent is the employee able to convey information to colleagues, supervisor, customer or others on a timely basis with quality, integrity and respect. Consider also the extent to which the employee actively listens and comprehends information.					
Employee's written or verbal messages are consistently understood. Uses words wisely and avoids downward spirals; comments are insightful, inspired and focused on the intent and end result with minimal loss of productivity. Listens and comprehends well and uses body language appropriately.	Generally able to communicate as required. Asks questions for clarity and follows written and oral instructions. Effectively communicates issues to supervisor promptly and without pointing blame. Written communication is consistent with job requirements.		Has difficulty communicating effectively; messages are often unclear and does not exhibit understanding of work instructions. May get into downward spiral conversations, participating in gossip or blame-laying. Written communications require improvement to meet job requirements.		
Exceeds Expectations		Meets Expectations		Requires improvement	
<input type="checkbox"/> 6	<input type="checkbox"/> 5	<input type="checkbox"/> 4	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1
Examples of communication:					
Behaviors and development objectives that would improve the current rating or maintain an Excellent rating:					

7. Compliance: To what extent does the employee follow policies and procedures? What efforts were made to help others gain awareness of safety & security issues?					
Employee sets a good example by consistently and enthusiastically adhering to company policies AND reminds others of safety and security issues.	Can be counted on to set a good example by following safety and security protocols. Asks for clarification if unsure.		Employee fails to follow company safety rules or security protocols. Makes adjustments in order to comply when supervision is present. Does NOT consistently set an example for others.		
Exceeds Expectations		Meets Expectations		Requires improvement	
<input type="checkbox"/> 6	<input type="checkbox"/> 5	<input type="checkbox"/> 4	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1
Examples of compliance:					
Behaviors and development objectives that would improve the current rating or maintain an Excellent rating:					

PART II – Performance Summary
Total evaluation scores and divide by seven for overall rating: _____
Supervisor: Summary comments on performance. Significant accomplishments, as applicable, and areas requiring improvement or development.
General development objectives and behaviors that would improve the current rating or prepare employee for advancement:

APPENDIX D: Archival Appraisal Rating Form (Continued)

PART III - Approvals – all approvals are required before discussing appraisal with employee

Supervisor Signature _____ Date _____
Next Level Manager _____ Date _____
Next Level Manager (optional) _____ Date _____
Human Resources _____ Date _____

PART V - Employee Acknowledgment

Employee comments (optional)

Employee Signature _____ **Date** _____