# HOGAN DEVELOPMENT SURVEY

## MANUAL

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# Hogan Development Survey Manual

Second Edition

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# 1. CONCEPTUAL BACKGROUND

## 1.1 Introduction

Talented people sometimes fail. Despite competence in skill areas relevant to adequate performance in a job, various factors can limit peoples' ability to perform consistently at a high level. Then, difficulties at work appear as problematic behaviors in the interpersonal context that defines the workplace. These problematic behaviors arise from any of a number of common dysfunctional dispositions. These dispositions (a) reflect people's distorted beliefs about themselves, how others will treat them, and the best means to achieve their personal goals, and (b) negatively influence people's careers and life satisfaction. The Hogan Development Survey (HDS; R. Hogan & Hogan, 1997, 2009) assesses eleven of these dysfunctional personality syndromes. The HDS can be used both as an element of the personnel selection process and as a source of information for assisting employees who want to improve their job performance and work relations. Our measurement goals are to provide valid information to employers and employees for purposes of personnel decision making and for career development. The purpose of this technical manual is to describe the development of the HDS, to present psychometric information, to overview interpretive scale descriptions, and to outline administration and scoring processes.

## 1.2 The Problem

Maladaptive behavior patterns are apparent at any level of an organization. Considering the importance of talent (from front-line managers to high-level executives) to an organization's success, leadership is the target of considerable theory, research, and media interest (cf. Bloom & Van Reenen, 2007; Dotlich & Cairo, 2003). Successful leaders are those who communicate a corporate vision to subordinates effectively, organize and motivate productive teams, manage personnel efficiently, and set clear and realistic standards for accomplishment (R. Hogan, Curphy, & Hogan, 1994; R. Hogan & Kaiser, 2005; R. Hogan, 2007; Kaplan & Kaiser, 2003).

Poor leadership, which can seriously impact the productivity and satisfaction of subordinates, is not simply an absence of these skills. Rather, dysfunctional dispositions and the behaviors associated with them can degrade or neutralize whatever skills and competencies a leader may possess. The phenomenon of dysfunctional dispositions is characterized by the coexistence of technical competence and interpersonal inadequacy. At their worst, these leaders may be seen as "destructive" (e.g., Einarsen, Aasland, & Skogstad, 2007; Tepper, 2000; Tierney & Tepper, 2007) or "toxic" (Frost, 2004; Padilla, Hogan, & Kaiser, 2007) by their subordinates and the organization as a whole. Managerial incompetence also has serious moral implications because bad managers cause great misery for their subordinates (R. Hogan & Kaiser, 2005). The National Institute for Occupational Safety and Health (NIOSH), a division of the Centers for Disease Control (itself a division of the National Institutes of Health), published a report in 1999 containing some alarming data (NIOSH, 1999). For example, 40% of American workers report that their jobs are very or extremely stressful, and NIOSH concludes that problems at work are more strongly associated with health complaints than any other life stressor, including finances and family problems. Next, consider that organizational climate surveys routinely show that about

75 percent of working adults report that the most stressful aspect of their job is their immediate boss (R. Hogan, 2007, p. 106).

Academic research replicates these findings. Ashforth (1994), Tepper (2000), and Skogstad, Einarsen, Torsheim, Aasland, and Hetland (2007) trace the empirical links between bad managers and employee stress—Kelloway, Sivanathan, Francis, and Barling (2005) provide a fine review of this literature. Bad managers are a major health hazard; they impose enormous medical costs on society, and degrade the quality of life of many people.

There are more bad managers employed today than many people realize. R. Hogan (2007) suggests that the base rate for bad managers within organizations may range from 65% to 75%, and one recent survey of managers and executives suggests that as many as 27% of their subordinates, despite being rated high in potential, are at risk for being demoted or fired for performing below the level expected of them. Such surveys are consistent with earlier reviews (e.g., Bentz, 1985; Leslie & VanVelsor, 1996; McCall & Lombardo, 1983). We found twelve published estimates of the base rate of managerial failure which range from 30 to 67 percent, with an average of about 50 percent (R. Hogan, Hogan, & Kaiser, 2009; Table 1). Based on the data, we suggest that two thirds of existing managers are insufferable and that half will eventually fail. Bad leadership is common and highly consequential for the effectiveness of organizations, and many of the phenomena that degrade leadership reflect the dysfunctional dispositions assessed by the HDS.

Although ineffective or destructive leadership can impact the fate of organizations, dysfunctional personality characteristics also can degrade the effectiveness of employees who are not in leadership positions. Consider the machinist who suffers an "emotional meltdown" after receiving feedback, the customer service representative who keeps callers "on hold" longer than necessary, the bookkeeper whose perfectionism results in an inability to meet deadlines, the over-the-road truck driver who adds illegal weight to a load to increase income. In each case, dysfunctional tendencies interfere with career success.

Finally, when describing dysfunctional dispositions, we are not speaking of discrete behaviors that can negatively impact an organization: workplace violence, theft, intentional accounting irregularities, and other "counterproductive work behaviors" (cf., Fox & Spector, 2005; Ones, 2002). Rather, we are describing more pervasive, and sometimes more subtle patterns of behavior which, although less spectacular, can nevertheless create significant ongoing problems for executives, managers, subordinates, and, ultimately, stakeholders in the organization.

## 1.3 The Theoretical Context: Socioanalytic Theory and Organizational Dynamics

As we have argued elsewhere (R. Hogan, 1983, 2004, 2007; R. Hogan & Shelton, 1998), we believe that socioanalytic theory captures the dynamic relevant to success in any group endeavor. Grounded in both interpersonal (Carson, 1969; Leary, 1957; Wiggins, 1979) and evolutionary (Barrett, Dunbar, & Lycett, 2002; Dawkins, 1976) psychology, socioanalytic theory argues that, as group-living animals, humans evolved strategies for maximizing individual and group survival. All groups are organized in status hierarchies, and interaction within

groups involves negotiating (either explicitly or implicitly) for acceptance and status. Correspondingly, people are motivated both to "get along" (maximize popularity) and to "get ahead," (maximize status relative to other members of the group). Behavioral characteristics and personal dispositions are dysfunctional if they interfere with an individual's capacity to get along or get ahead. Even when individuals are satisfied with their position in the status hierarchy, they still must "get along" with others in order to maintain their position within the group.

Occupational life consists of episodes organized according to agendas and roles—what will be done and who will do it (Motowidlo, Borman, & Schmit, 1997). These episodes involve social interaction and efforts to get along and get ahead take place during these episodes (R. Hogan & Hogan, 2007). To get along, people must cooperate and seem compliant, friendly, and positive. If they do this successfully, they are evaluated as good "team players," organizational citizens, and service providers (Mount, Barrick, & Stewart, 1998). To get ahead, people must take initiative, seek responsibility, and try to be recognized. They must have good "political intelligence" (Adams & Zanzi, 2006; J. Hogan & Hogan, 2002; Holland, Hogan, & Van Landuyt, 2002), demonstrate social skill when interacting with others (J. Hogan & Hogan, 2002; R. Hogan, Curphy, & Hogan, 1994), and accurately analyze team and subordinate behaviors and outcomes (Harvey, Martinko, & Douglas, 2006). If they do this successfully, they are described as achieving results, performing well, and contributing to organizational goals (Conway, 1999; R. Hogan, 2007).

Thus, a variety of interpersonal and "intrapersonal" factors facilitate a person's ability to ascend in the organization's status hierarchy, if that person is motivated to do so. In this regard, it is useful to distinguish between "task performance" and "contextual performance" (Borman & Motowidlo, 1993; Motowidlo et al., 1997). Task performance depends on a person's level of competence in the technical tasks required by a given job; in contrast, contextual performance concerns the interpersonal skills that facilitate or inhibit task-related activities. J. Hogan and her colleagues demonstrated that personality impacts contextual performance, ultimately influencing individual job success (J. Hogan, Rybicki, Motowidlo, & Borman, 1998). Dysfunctional personality dispositions primarily impair an employee's efforts to "get along" within the contextual domain. Further, if the person's job requires interpersonal (as opposed to purely technical) skill, task performance also can be negatively impacted by dysfunctional dispositions, thwarting the person's efforts to "get ahead."

## 1.4 The Nature of Dysfunctional Dispositions

Dysfunctional dispositions are part of everyone's personality. Personality is reflected in a person's "reputation" among those in a person's social sphere. Personality trait descriptors (e.g., conscientious, flamboyant, sociable, etc.) summarize how a person is seen by others. The "strength" of any personality characteristic simply reflects the likelihood that a person will behave (and be perceived) in a certain way during social interaction. A person who generally behaves in a warm, open, and caring manner during social interaction will be seen as "friendly," and "interpersonally sensitive." Conversely, a person who behaves in a cold, aloof, and uncaring manner across most situations will be seen as unfriendly and insensitive.

Modern personality researchers consider five broad dimensions of personality (emotional stability, extraversion, agreeableness, conscientiousness, and openness to experience) to subsume the basic dimensions of interpersonal evaluation (Digman, 1990; Goldberg, 1981, 1992; John, 1990; McCrae & Costa, 1987; Wiggins, 1979). This "five-factor model" (FFM) reflects the "bright side" of personality: persons scoring high on assessments of the FFM are typically described in more positive terms than those scoring low. Thus, the FFM provides a useful and systematic method for classifying individual differences in behavior and reputation.

Assessments derived from the FFM consistently predict success in a wide variety of employment contexts (Barrick & Mount, 1991; Bono & Judge, 2004; Hogan & Holland, 2003; R. Hogan, 2007; R. Hogan & Hogan, 2007; R. Hogan, Hogan, & Roberts, 1996; Judge, Bono, Ilies, & Gerhardt, 2002; Mount, Barrick, & Stewart, 1998; Tett, Jackson, & Rothstein, 1991). The prediction of occupational performance improves when the dimensions of the FFM are aligned with the competencies judged to be important for a specific job (Anderson, Foster, Van Landuyt, & Tett, 2006; Campbell, 1990; Hogan & Holland, 2003; Hough, 1992; Hurtz & Donovan, 2000). For example, air traffic controllers and salespersons differ in the skills required for successful performance and in the personality characteristics that best predict these skills. J. Hogan and her colleagues demonstrated that personality affects contextual performance according to the opportunities for advancement afforded by a particular job (J. Hogan, Rybicki, Motowidlo, & Borman, 1998). Finally, interactions among the FFM dimensions may further refine the capacity of personality assessment to predict success in different job families (Foster & Macan, 2006; Warr, Bartram, & Martin, 2005; Witt, Burke, Barrick, & Mount, 2002).

Dysfunctional dispositions reflect the "dark side" of personality (cf. Conger, 1990). These behavioral characteristics can degrade job performance and interfere with an individual's capacity to capitalize on strengths revealed through FFM assessments. In 1992, as an experiment, we included measures of "dark side" personality scales in a study of the performance of insurance claims examiners. We discovered, to our surprise, that several dark side dimensions were robust predictors of unsuccessful performance (Arneson, Milliken-Davies, & Hogan, 1993). In fact, they predicted performance better than the Hogan Personality Inventory (HPI: R. Hogan & Hogan, 1995, 2007)—a measure of normal personality based on the FFM—although they predicted in the negative direction. At this point we decided to develop the HDS.

The past 20 years produced a growing interest in the factors that interfere with job performance, particularly among people in leadership jobs (Furnham & Taylor, 2004; Goldman, 2006; R. Hogan & Hogan, 2001; Judge, LePine, & Rich, 2006; Khoo & Burch, 2008; McCartney & Campbell, 2006; Moscoso & Salgado, 2004; Najar, Holland, & Van Landuyt, 2004). As noted, these "dysfunctional dispositions," "performance risk factors," "dark side characteristics," or "derailers" are relatively common among managers and executives (cf. R. Hogan, 2007; Dotlich & Cairo, 2003). There will be individual differences in the tendency for dysfunctional behavior to emerge in any given situation—some people are more prone to such behavior than others.

Where do dysfunctional dispositions come from? Why do some people behave in ways that are ultimately self-defeating? The study of dysfunctional behavior has a long history in psychology. Over 100 years ago, Sigmund Freud argued that everyone (who has not been psychoanalyzed) is somewhat "neurotic," that is, riddled by fear,

guilt, anxiety, and malaise caused by unconscious conflicts based on deficits in parenting during the earliest years of life. Later theorists (Alfred Adler, Karen Horney, Erik Erikson, Harry Stack Sullivan, and others) argued that people's problems are based in how they interact with others. Also, they believed that people can best be described in terms of their beliefs and expectations about how others will treat them, rather than in terms of unconscious conflicts.

Freud's view that everyone is neurotic is empirically false. Conversely, the interpersonal theorists are probably correct in their view that early experience (in the family, at school, in the peer group) guarantees that almost everyone feels inadequate about something. That is, childhood and adolescence are almost inevitably stressful in certain ways, and most people develop expectations that, in certain situations, they will be criticized, and/or feel inadequate or helpless. Also, they develop strategies for coping with these expectations.

For personality, the interpersonal theorists exert less influence on personality assessment than Freud. Other than research on the interpersonal circumplex inspired by Leary (1957), elaborated brilliantly by Wiggins (1979), and extended further by Benjamin (1996), there is little systematic effort to assess the key interpersonal processes. In our judgment, the first step toward studying these processes is to develop a taxonomy of dysfunctional dispositions. Horney (1950) identified 10 "neurotic needs" that seem to constitute the first taxonomy of flawed interpersonal tendencies. She later summarized these needs in terms of three themes: (1) moving toward people—i.e., managing one's insecurities by building alliances in which the threat of criticism can be minimized; (2) moving away from people—i.e., managing one's feelings of inadequacies by avoiding true connection with others; and (3) moving against people—i.e., managing one's self-doubts by dominating and intimidating others.

We encode our perceptions of others' behavior, and our inferences about the meaning of those behaviors in terms of "schemas." Schemas are organized knowledge structures that allow us to make sense of our own behavior and the behavior of others (Fong & Markus, 1982; Kihlstrom & Klein, 1994; Markus, 1977; Sedikides, 1993; Young, Klosko, & Weishaar, 2003). Personal schemas reflect basic beliefs about ourselves and the world—beliefs that are based on early life experiences. These schemas function automatically and outside our conscious awareness; they represent our implicit personal "theories" about the meaning of our social experience. Scientists are more likely to attend to data that fit their favored theories than data that disconfirm them (cf. Kuhn, 1970). Similarly, personal schemas serve as "filters" that cause individuals to interpret social information in ways that fit schema-relevant expectations (Baldwin, 1992); thus, schemas tend to be self-perpetuating. For example, people who were frequently criticized early in life may develop belief structures—schemas—that they are likely to be criticized in current interpersonal encounters. At times, these people interpret even innocuous feedback as critical. To avoid expected criticism, people may become perfectionistic and overly accommodating in interpersonal interactions—an example of Horney's pattern of "moving toward people." Dysfunctional dispositions, then, reflect the effects of maladaptive schemas. Given that few normal people act so as to consciously cause self-harm (Baumeister & Scher, 1988), several variables affect the emergence of self-defeating behavior. First, as we noted earlier, there are individual differences in the likelihood that a person will behave in a self-defeating manner in any given context. The probability of dysfunctional behavior reflects the strength of the relevant underlying schema. Second, situational variables will affect the emergence

of dysfunctional behavior. Most people can manage dysfunctional behavior most of the time. But fatigue, illness, stress, high emotion, boredom, and lack of social vigilance can potentiate maladaptive behavior. Furthermore, dysfunctional behavior is more likely to appear in weaker, ambiguous interactions (Green & Sedikides, 2001; Koch, 2002), where leaders have too little structure and too much discretion (Kaiser & Hogan, 2007), or ones that resemble the situations that produced the relevant schema in the first place. Finally, organizational culture can potentiate dysfunctional behavior (Blathazard, Cooke, & Potter, 2006; VanFleet & Griffin, 2006). Thus, personality, situational, and organizational influences interact to influence the appearance of dysfunctional behavior in any given performance or interpersonal context (cf. Tett & Burnett, 2003; Tett & Guterman, 2000).

The assessment of dysfunctional dispositions—performance risks—allows us to predict when a particular "dark side" characteristic is likely to emerge. A high score on a particular dysfunctional personality characteristic indicates that a person is more likely to manifest that characteristic behavior. The HDS is designed to assess 11 of these characteristics. A manager can use the HDS to identify individuals who are likely to behave in self-defeating ways in compromising situations. Further, knowledge of these risk factors, coupled with hypotheses about the underlying schemas from which they emerge, can provide a starting point for improving the value of existing employees for the organization as a whole. These are the purposes for which we developed the HDS.

## 1.5 Development Guidelines

We developed the HDS based on four considerations. The first addresses what to measure. The study of "dark side" personality characteristics has not produced a taxonomy similar to the FFM. Nonetheless, the literature shows considerable agreement regarding the characteristics of managerial incompetence. Bentz (1985) identified several leadership styles associated with managerial derailment in the retail industry (e.g., playing politics, moodiness, and dishonesty). Researchers at the Center for Creative Leadership and at Personnel Decisions International similarly concluded that derailed managers who are technically competent but who fail are variously perceived as arrogant, vindictive, untrustworthy, selfish, emotional, compulsive, overcontrolling, insensitive, abrasive, aloof, too ambitious, or unable to delegate (Hazucha, 1991; Lombardo, Ruderman, & McCauley, 1988; McCall & Lombardo, 1983).

These themes resemble what clinical psychologists and psychiatrists describe as "personality disorders." As defined by the widely influential Diagnostic and Statistical Manual of Mental Disorders, 4th edition, text revision (DSM-IV-TR; American Psychiatric Association, 2000), a personality disorder is "an enduring pattern of inner experience and behavior that deviates markedly from the expectations of the individual's culture, is pervasive and inflexible, has an onset in adolescence or early adulthood, is stable over time, and leads to distress or impairment" (p. 685). The DSM-IV-TR lists 10 personality disorders, each defined by the presence of specific behavioral or psychological symptoms. We found the patterns of personality dysfunction described in the DSM-IV-TR to be a useful starting point for developing our own taxonomy of dysfunctional dispositions.

It is important to emphasize that the HDS is not designed to measure personality disorders—the personality disorders are manifestations of mental disorder, and we are assessing self-defeating expressions of normal per-

sonality. The DSM-IV-TR makes this same distinction between behavioral traits and disorders—self-defeating behavior comes and goes depending on the context; personality disorders are enduring and pervasive across contexts (American Psychiatric Association, 2000, p. 686). Also, we retained the concept of Passive-Aggressive Personality (no longer present in the DSM) because it is an important theme in the behavior of some employed adults; moreover, our measure that parallels the Antisocial Personality is designed to assess classic psychopathic tendencies (manipulation, deceit, and exploitation) rather than the delinquent lifestyle addressed by the DSM-IV-TR.

Table 1.1
HDS Scales: Themes and Implications

| HDS Scale | Corresponding DSM-IV-TR Personality Disorder | Themes and Implications |
|---|---|---|
| *Excitable* | (Borderline) | Moody and hard to please, with intense but short-lived enthusiasms for people and projects. High scorers are sensitive to criticism, volatile, and unable to generate respect from subordinates due to frequent emotional displays. |
| *Skeptical* | (Paranoid) | Cynical, distrustful, and quick to doubt others' true intentions. While acutely sensitive to organizational politics, high scorers are easily offended, argumentative, and ready to retaliate for perceived mistreatment. |
| *Cautious* | (Avoidant) | Reluctant to take risks or initiative due to fear of failure or criticism. High scorers are good "corporate citizens" but avoid innovation, offering opinions, taking controversial positions, or making decisions. |
| *Reserved* | (Schizoid) | Aloof, detached, uncommunicative, and disinterested in the feelings of others. High scorers work poorly in groups, are reluctant to give feedback, are insensitive to social cues, and often appear intimidating. |
| *Leisurely* | (Passive-aggressive) | Independent, resistant to feedback, and quietly resentful of interruption or others' requests. High scorers can be pleasant but difficult to work with due to procrastination, stubbornness, and unwillingness to be part of a team. |
| *Bold* | (Narcissistic) | Unusually self-confident, reluctant to admit shortcomings, and grandiose in expectations. High scorers feel entitled to special treatment, are reluctant to share credit, and can be demanding, opinionated, and self-absorbed. |
| *Mischievous* | (Antisocial) | Charming and friendly, but impulsive, non-conforming, manipulative, and exploitive. High scorers test limits, ignore commitments, take ill-advised risks, and resist accepting responsibility for mistakes. |
| *Colorful* | (Histrionic) | Expressive, dramatic, distractible, attention seeking, and disorganized. High scorers confuse activity with productivity, are unable to allow others to offer suggestions, and are intuitive rather than strategic in decision making. |
| *Imaginative* | (Schizotypal) | Creative, eccentric, impractical, and idiosyncratic in thoughts and ideas. High scorers avoid details, are easily bored, lack awareness of their impact on others, and often fail to see the practical limitations of their suggestions. |
| *Diligent* | (Obsessive-compulsive) | Meticulous, perfectionistic, critical, and inflexible about rules and procedures. High scorers micromanage their staff, find it hard to delegate, and have difficulty setting meaningful priorities for themselves and their subordinates. |
| *Dutiful* | (Dependent) | Eager to please, reliant on others for guidance, and reluctant to take action independently. High scorers have difficulty making decisions on their own, may not stick up for subordinates, and promise more than they can deliver. |

Table 1.1 presents the 11 HDS scales and describes how they might undermine a person's occupational success. For comparison purposes, the corresponding category from the DSM-IV-TR is listed in parentheses following the name of each HDS scale.

The second consideration guiding the development of the HDS concerns how to conceptualize the constructs listed in Table 1.1. The HDS scales measure interpersonal competencies. They concern dimensions ranging from good interpersonal skills, to flawed skills, to non-existent skills. Interpersonal competency is normally distributed; thus, a few people at one end of the distribution are self-assured and highly effective in almost every social interaction, and a corresponding few at the other end are consistently incompetent—they may even display behavior associated with a personality disorder. Most people are in the middle of this distribution—they are people whose development included failure, disappointment, loss, fights, family discord, humiliation, illness, inadequacy and betrayal—about whose lives Adler, Horney, and Sullivan wrote so perceptively. The scales of the HDS refer to distinct themes—dysfunctional dispositions—appearing in interpersonal relationships. People are normally distributed on these dimensions, with higher scores denoting a greater likelihood that dysfunctional behavior will emerge in any given interpersonal context. Any single person may have high or low scores on any of the dimensions.

The third consideration guiding the development of the HDS is how to measure the constructs that comprise the inventory. The standard approach to scale construction typically involves writing items based on the symptoms that define each of the DSM-IV-TR personality disorders. This approach was not useful in the development of the HDS for two reasons. First, the DSM-IV-TR assigns many of the same attributes to more than one personality disorder; for example, sensitivity to criticism is a criterion defining four of the standard 10 disorders. This builds in item overlap and necessarily reduces the power of such inventories to discriminate among people. Second, the criteria listed in the DSM-IV-TR are pathological; that is, they define a mental disorder. To avoid these problems, we wrote items directed at the heart of each construct; then, we carefully reviewed the item content across scales to minimize indicants of psychopathology and to eliminate item overlap. In doing so, we sought to enhance the discriminatory power of the entire inventory. The content of each scale is independent of the content of the other scales.

A final consideration shaping the development of the HDS concerns the actual content of the items (R. Hogan, Hogan, & Roberts, 1996). Because the HDS is intended to be used in everyday contexts for career development, job placement, promotion, and other "people decisions"—as opposed to being used to assess mental health status or as an element of a medical evaluation—the items reflect themes from the world of work; e.g., how one is perceived at work, how one relates to supervisors, co-workers, and friends, attitudes toward competition and success, and the like. To further enhance the relevance of the HDS in everyday workplace applications, the scales have labels that do not stigmatize persons with high scores on the various dimensions. The development of the HDS test item content benefited from definitions, distinctions, and clarifications provided by recent laws such as the Americans With Disabilities Act of 1990 (ADA, 1990) and court rulings (e.g., Karraker v. Rent-a-Center, 2005). The HDS is race/ethnicity-, age-, and gender-neutral, ensuring that it can be used fairly in personnel decision making.

# 2. INVENTORY CONSTRUCTION, RELIABILITY, AND STRUCTURAL PSYCHOMETRICS

## 2.1 Development

As noted in Chapter 1, the scales of the Hogan Development Survey (HDS) have their roots in several taxonomies of flawed interpersonal characteristics including Horney's "neurotic needs," Wiggins' interpersonal circumplex, and Bentz's "overriding personality defects." The original model for the HDS is the PROFILE, developed by Warren Jones (1988) shortly after the appearance of the DSM III, Axis 2 personality disorders (American Psychiatric Association, 1987). Jones intended to use the PROFILE as a psychometrically defensible alternative to the inventories of personality disorders available to clinical psychologists at the time. We used the PROFILE for about five years with our clients in business and industry and conducted several validity studies. We began to see associations between PROFILE scores and problem managers, and other indications that personality dysfunction is related to failures in the achievement of otherwise normal career potential.

We concluded that there is a role for the assessment of "dysfunctional dispositions" in the workplace. However, we were concerned about the overt clinical content of the PROFILE and its emphasis on anxiety and depression. With the passage of the Americans with Disabilities Act of 1990 (ADA; 1990), it became clear that scales of the PROFILE would be seen as evaluations of mental disabilities, which are prohibited for pre-offer employment inquiries. We saw a need for a non-clinical inventory to assess interpersonal behaviors that adversely affect the performance or reputation of people at work. We envisioned a tool to be used primarily for professional development and coaching and only secondarily for personnel selection, with the requirement of local validation to demonstrate job-relatedness.

As mentioned in Chapter 1, at least three sources influenced our thinking about the scales of the HDS. One source was the unique themes of behavior that are suggested by the personality disorders but that are common expressions of normal personality—everyone has at least one such characteristic. The second was the literature on managerial derailment--a literature that became accessible through the technical reports and popular publications from the Center for Creative Leadership (cf. J. Hogan, Hogan, & Kaiser, 2009). The third source was data from appraisals of others at work, and, in particular, evaluations of managers by coworkers who knew their performance well (Millikin-Davies, 1992; Shipper & Wilson, 1992; Sorcher, 1985; White & DeVries, 1990). In our view, first line supervisors and mid-level managers probably affect the productivity and satisfaction of more workers than any other occupational classification in an organizational structure. Therefore, we targeted for assessment the problems that these managerial levels display most frequently.

Our strategy for writing the items focused on the distinctive characteristics of each dysfunctional disposition. We wrote items with work-related and interpersonal content, and we avoided items referring to mental disabilities, clinical themes, religious beliefs, or sexual preferences. Like the HPI, the items are designed to reflect what a person with that particular disposition might say or do. Finally, we tried to develop scales with non-overlapping and homogeneous themes and to avoid repeating descriptors across scales. This was challenging be-

cause some characteristics are common to several scales. For example the adjectival descriptor "shy" is used by others reporting reputational characteristics of individuals who have high scores on Cautious, Reserved, and Dutiful. Also, we tried to minimize intercorrelations between the scales.

We began working on the HDS on Labor Day (US) weekend, 1992. We wrote items for one scale at a time. We wrote an initial set of items, tested samples of people, computed internal consistency reliabilities and correlations with other well-established measures, reviewed the data, and revised the items so as to: (a) enhance internal consistency reliability and; (b) sharpen convergent and discriminant validity. Also, we solicited and received valuable input from many colleagues in the United States and Europe concerning the content of the scales. The HDS is the product of six cycles of item writing, revision, testing, and further revision. The final set of items was defined during the summer of 1995.

Between 1995 to 1996, we tested over 2,000 people, including employed adults, job applicants, prisoners, and graduate students. The ages in these samples ranged from 21 years to 64 years, with a mean of 38.5 years. There were 1,532 men and 322 women, 620 whites and 150 blacks. We estimate that about 15% of the sample was college educated.

In 2002, we developed a sophisticated, scalable internet testing platform to replace our first system of on-line assessment. This assessment platform was designed for security, ease of use, speed, and flexibility. The system is fully redundant, using a multi-location systems architecture to ensure its constant availability. This permits constant data collection from anywhere in the world from any internet capable personal computer. Most assessments are delivered and scored using this on-line system. Between 2002 and year end 2008, we scored approximately 750,000 HDS assessments using the internet delivery system. Although, we also administered the HDS in paper-and-pencil format, these inventories compose less than 1% of our volume. We sampled from within this Hogan HDS population to draw subsamples for the norming sample. The procedures used and the samples included are explained in Chapter 6.

Over the last ten years, we focused on HDS validity research, using the technical and methodological processes needed to promote evaluation of test validity. This work allowed us to generate a range of reports where report text could be linked to valid descriptions of respondents, using observer ratings and other criteria. We were concerned not only with the validity of the scales, but we were concerned with the validity of the content interpretations presented in reports. It seemed clear that we needed more work on personality-based job requirements, and although we developed a methodology to evaluate personal requirements as "abilities" in the conventional KSA vernacular (R. Hogan & Hogan, 1995, p. 75), we considered the possibility that a direct approach could be more efficient. We developed the Derailment Characteristics Questionnaire (DCQ) job analysis that asked subject matter experts to evaluate personality characteristics that represent performance barriers in a job (J. Hogan, 2002). The DCQ is a reliable and valid job analysis tool for evaluating and documenting the personality-based requirements of jobs.

Similarly, we began paying attention to the criterion problem and tried to conceptualize performance data in terms of models that were consistent with socioanalytic theory. That is, if the veracity of motivational premises "getting along" and "getting ahead" is useful, then we ought to be able to recover and evaluate these themes in job performance—themes that enhance and inhibit effective performance. We developed the Competency Evaluation Tool (CET) as a performance taxonomy organized conceptually around socioanalytic theory and developmentally around the domain model of skills (R. Hogan & Warrenfeltz, 2003; J. Hogan, Davies, & Hogan, 2007; Warrenfeltz, 1995). The CET is the basis for our validity generalization research and is an organizing feature of the Hogan archives.

Also during this decade, we applied a systematic focus on local validation research. We built a data warehouse and a research archive on a foundation of criterion-related validity studies, with the Hogan tools, including the HDS, as the primary predictors. We conducted over 50 empirical studies with client organizations across jobs that represent executive, managerial, professional, operational, service, and technical jobs in the US economy. These are both private and public sector organizations. Our database is almost exclusively samples of job applicants or working adults. Of those who are working, these individuals have completed assessments either for selection, research, or professional development. Internet online testing facilitated rapid accumulation of data and the ability to process validation studies efficiently.

With sufficient accumulated validity evidence for the HDS, we began aggregating results and generalizing validity inferences. We use the strategies of construct validity, criterion-related validity, transportability of validity, synthetic/job component validity, and meta-analysis. In 2005, we published an in-house comprehensive HDS-based meta-analysis which showed that when predictors and criteria are construct aligned, the meta-analytic validity exceeds that of atheoretical approaches (see also J. Hogan & Holland, 2003). Subsequently, we published a demonstration project of validity generalization methods for personality measures (J. Hogan, Davies, & Hogan, 2007). Most recently in 2007, we joined with Lewis Goldberg in a joint project to administer the HDS to the Eugene/Springfield Community Sample. Goldberg's sample is unique and distinctive because it represents a longitudinal study of personality and personality-related assessment that is carefully maintained since 1992. The sample consists of slightly less than 800 individuals who are residents of the Eugene/Springfield, Oregon, USA area and who volunteered for long-term participation. Every year, they complete a few psychological assessments that are maintained in a database at the Oregon Research Institute. To date, this sample possibly represents the richest database of personality assessment ever collected, with matched data on 30 of the best psychological assessments available currently. Several hundred individuals completed the HDS on-line (the first computer testing administration experienced by these subjects!) and their data were matched with other assessment results in the database. For Hogan, this represents an unparalleled source of information for HDS construct validity. Access to the database can be requested through Dr. Goldberg.

In 2008, we updated the norms for the HDS. These now appear in this manual, (chapter 6), along with the description of how the norming population was identified. The score distributions for some scales on the HDS have changed slightly since 1997. Specifically, the scale means increased slightly over time, resulting in

changes of about five percentage points for some raw scores. The most change appears with the Cautious scale where norms associated with a few raw scores increased eight percentage points. However, note that higher scores are less desirable than lower scores—that is, they indicate more dysfunctional tendencies

Since we began large-scale assessment work with a number of clients, it is necessary to develop parallel forms of the HDS. Although equivalent forms of cognitive ability and achievement tests are available from commercial test publishers, parallel forms of personality measures are typically unavailable. A notable exception is SHL's OPQ32 (SHL Group, 2006). Current research is now devoted to developing multiple parallel forms for the HDS with extended forms that allow data collection on experimental items. This has the advantage of a direct comparison of new items with the existing HDS scales. In addition, we are evaluating the development and use of a facet structure similar to the Homogeneous Item Composite (HIC) structure that we used to build the HPI scales. Although some experimental facets exist, we need to improve the psychometric quality of these item composites before we can introduce them for more applied and interpretive use.

Finally, we should acknowledge the number of language translations we completed in the last ten years. Although the translation process is continual, the translations have come about in response to client needs. Our US domestic clients who have global businesses drive our efforts to undertake translations. This strategy places a premium on accurate and equivalent translations because, in many cases, organizations want to compare people from around the world for corporate jobs across the globe. Thirty-two language versions of the HDS are available for administration and at least one reporting option can be produced from each translation. Of key importance in this work is the investigation of score equivalence and construct/predictive validity for each translated test. This is a multifaceted process which, in part, depends on using straightforward psychometric measurement invariance analyses alongside procedures for demonstrating predictive equivalence (e.g., Millsap, 1997).

The HDS is intended to be used with adults, not children nor adolescents. It is intended for a normal population, not clinical, psychiatric, nor psychopathological samples. Although the HDS is used widely in occupational contexts for personnel selection and professional development, it is also appropriate for use with adults in peer, family, community, and friendship relations research and counseling. The HDS is neither a medical examination, nor can it be used to evaluate medical conditions, mental illness, mental disabilities, or physical disabilities. In addition, unintended assessment uses would also include forecasting or evaluating neuropsychological behavior, suicidal thoughts/behavior, specific criminal actions, cognitive ability, cognitive deficits, dementia, non-verbal reasoning, academic skills, learning disabilities, visual/motor abilities, hyperactivity, perceptual abilities, and/or information obtained from polygraph/biofeedback instruments.

## 2.2 Definitions of the Scales

The 11 HDS scales are defined as follows:

*Excitable* concerns seeming moody and inconsistent, being enthusiastic about new persons or projects and then becoming disappointed with them. Example Item: My mood can change quickly.

*Skeptical* concerns seeming cynical, distrustful, overly sensitive to criticism, and questioning others' true intentions. Example Item: There are few people I can really trust.

*Cautious* concerns seeming resistant to change and reluctant to take even reasonable chances for fear of being evaluated negatively. Example Item: It is difficult for me to be assertive.

*Reserved* concerns seeming socially withdrawn and lacking interest in or awareness of the feelings of others. Example Item: I prefer spending time by myself.

*Leisurely* concerns seeming autonomous, indifferent to other people's requests, and becoming irritable when they persist. Example Item: I ignore people who don't show respect.

*Bold* concerns seeming unusually self-confident and, as a result, unwilling to admit mistakes or listen to advice, and unable to learn from experience. Example Item: I do most things well.

*Mischievous* concerns seeming to enjoy taking risks and testing the limits. Example Item: I have few regrets.

*Colorful* concerns seeming expressive, dramatic, and wanting to be noticed. Example Item: Other people pay attention to me.

*Imaginative* concerns seeming to act and think in creative and sometimes unusual ways. Example Item: I am creative about my appearance.

*Diligent* concerns seeming careful, precise, and critical of the performance of others. Example Item: I take pride in organizing my work.

*Dutiful* concerns seeming eager to please, reliant on others for support, and reluctant to take independent action. Example Item: I leave the big decisions up to others.

## 2.3 Item Composition of the Scales

The HDS contains 168 items in the form of statements to which a respondent indicates "agree" or "disagree" (0 = disagree, 1 = agree). Each scale contains 14 items that were derived rationally from its distinguishing syndrome feature; scale scores range from 0 to 14. Items are scored so that higher scores represent more dysfunctional tendencies. There is no item overlap among the 11 scales. The items were screened for content that might seem offensive or to invade privacy. There are no items concerning sexual preferences, religious beliefs, criminal or illegal behavior, racial/ethnic attitudes, or attitudes about disabled individuals. Fourteen additional items appear on an experimental social desirability scale. Some applications contain extended forms to gather data on experimental items; these items are unscored and used subsequently for research purposes. Extended forms usually contain a total of 200 items. With the exception of the test-retest reliabilities, the data in Chapter 2 tables are based on the norming sample of 109,103 adults, virtually all of whom are job applicants or incumbents.

Readability statistics computed on the 168 items indicated an average sentence length of 9.8 words and an average word length of 3.9 characters. A Flesch-Kincaid reading level analysis shows that the inventory is written at a 6.9 grade level.

In the 1997 HDS manual, a principal components analysis of the 11-scale correlation matrix resulted in three "global" components being extracted, which accounted for 62% of the variance in the matrix. The first component was defined by the Excitable, Skeptical, Cautious, Reserved, and Leisurely scales and resembles the theme of "moving away from people" in Horney's (1950) model of flawed interpersonal tendencies. The second component was defined by the Bold, Mischievous, Colorful, and Imaginative scales and corresponds to Horney's theme of "moving against people." The third component was defined by the Diligent and Dutiful scales and corresponds to Horney's theme of "moving toward people."

The three global HDS scales are defined as:

Moving Away: managing one's insecurities by avoiding others.
Moving Against: managing one's self-doubts by dominating and intimidating others
Moving Toward: managing one's insecurities by building alliances to minimize the threat of criticism.

## 2.4 The 2008 US Normative Sample Dataset

Chapter 6 provides a comprehensive breakdown of the sample characteristics, demographics, ethnicity, and other relevant characteristics of normative sample. The total sample size is 109,103 cases, comprising 54,414 males and 52,273 females, with 1,966 cases who did not provide gender information. The mean and median age of the sample is 39 years of age, with a standard deviation of 10.45 and interquartile range between 30 and 46 years of age.

### 2.4.1 Selection Versus Development Group Comparability Analysis

Because some researchers and practitioners express concern about possible score differences between individuals completing the HDS in a competitive selection context versus a less obviously competitive development context, we examined the normative dataset for any inappropriate effects on both the score magnitudes and structural psychometrics of the inventory.

Two groups of respondents could be identified in this dataset, a Selection group who completed the inventory as part of a competitive selection situation, and a Development group who completed the inventory in a less competitive coaching and self-awareness situation. The Selection group consisted of 50,800 respondents, and the Development group consisted of 50,898 respondents.

We used five distinct statistical methodologies to examine group comparability:

1. Score mean differences on each of the 11 HDS scales, interpreted using Cohen d effect sizes (Cohen, 1992).
2. Alpha reliability coefficients (Cronbach, 1951) between the groups.
3. A correlation pattern hypothesis test comparing the Pearson 11-scale correlation matrices from each group.
4. An orthogonal Procrustes congruential rotation and comparative analysis between the Development and Selection group principal component factor loading matrices.
5. Non-metric Multidimensional Scaling of each group's double-scaled Euclidean distance similarity coefficient matrix, culminating in a Procrustes configural similarity comparison analysis.

The results from each analysis are presented below.

### 2.4.2 HDS Scale Score Mean Differences between the Development and Selection Groups

Independent mean t-tests were computed comparing the means of the Development and Selection groups for each HDS scale. Cohen d effect sizes indicated the meaningful differences between scale score means. Table 2.1 presents the results of this analysis.

Table 2.1

HDS Scale Score Means, Standard Deviations, and Comparative Effect Sizes Between Development and Selection Groups

| HDS Scale | $N_{dev}$ | $N_{sel}$ | $Mean_{dev}$ | $Mean_{sel}$ | $SD_{dev}$ | $SD_{sel}$ | d |
|---|---|---|---|---|---|---|---|
| Excitable | 50896 | 50796 | 2.80 | 2.83 | 2.51 | 1.95 | .01 |
| Skeptical | 50893 | 50794 | 4.48 | 4.17 | 2.44 | 2.26 | .13 |
| Cautious | 50897 | 50796 | 3.03 | 2.52 | 2.52 | 2.11 | .22 |
| Reserved | 50896 | 50796 | 4.22 | 3.89 | 2.16 | 1.85 | .16 |
| Leisurely | 50886 | 50796 | 4.51 | 4.51 | 2.20 | 1.73 | .00 |
| Bold | 50867 | 50795 | 7.69 | 7.51 | 2.59 | 2.73 | .07 |
| Mischievous | 50889 | 50796 | 6.46 | 4.84 | 2.57 | 2.30 | **.66** |
| Colorful | 50890 | 50794 | 7.74 | 6.78 | 2.87 | 2.50 | .36 |
| Imaginative | 50880 | 50793 | 5.70 | 4.99 | 2.47 | 2.41 | .29 |
| Diligent | 50894 | 50794 | 9.17 | 10.39 | 2.30 | 1.68 | **.60** |
| Dutiful | 50896 | 50796 | 7.49 | 8.81 | 2.09 | 1.90 | **.66** |

*Note*. Effect sizes larger than 0.5 are highlighted in bold text.

Although three scales show effect sizes larger than 0.5, the mean difference between the Development and Selection group scale scores for these three scales is just 1.4 points.

### 2.4.3 HDS Coefficient Alpha Reliabilities for the Development and Selection Groups

For each HDS scale, an alpha reliability coefficient was computed using the data from the Development and Selection groups, respectively. Table 2.2 reports these coefficients.

Table 2.2

HDS Coefficient Alphas for the Development and Selection Groups

| HDS Scale | $N_{dev}$ | $N_{sel}$ | $alpha_{dev}$ | $alpha_{sel}$ | $alpha_{diff}$ |
|---|---|---|---|---|---|
| Excitable | 49865 | 50144 | .71 | .54 | **.15** |
| Skeptical | 49580 | 50214 | .65 | .62 | .02 |
| Cautious | 49871 | 50310 | .71 | .63 | .09 |
| Reserved | 49853 | 50323 | .62 | .51 | .09 |
| Leisurely | 49268 | 50273 | .51 | .37 | **.14** |
| Bold | 49355 | 50207 | .65 | .71 | -.06 |
| Mischievous | 49617 | 50285 | .58 | .52 | .06 |
| Colorful | 49407 | 50272 | .69 | .67 | .02 |
| Imaginative | 49330 | 50157 | .63 | .60 | .03 |
| Diligent | 49787 | 50319 | .59 | .43 | **.16** |
| Dutiful | 49692 | 50231 | .45 | .40 | .05 |

*Note.* Alpha discrepancies larger than 0.10 are highlighted in bold text.

Overall, there is a tendency for alphas to be lower for the selection group dataset.

### 2.4.4 Correlation Pattern Hypothesis Test – Comparing Development and Selection Group Correlation Matrices

Using Steiger's (1980a, b) correlation pattern hypothesis test for the equality of two or more correlation matrices (implemented in the STATISTICA software module SEPATH), it is possible to conduct a significance test for the equality of two matrices of correlation coefficients. The problem is that with the sample sizes in excess of 50,000, almost any discrepancy will yield a statistically significant result. Instead, we also use the RMSEA indicator of "closeness of fit", but rely on residual analysis/diagnostics to explicate "similarity" more fully.

The SEM (Correlation Pattern Analysis) Chi-Square Goodness of Fit, RMSEA, and SRMSR results are as follows:

| |
|---|
| Chi-Square = 5200.19, P < 0.00000001, df=55; |
| RMSEA = 0.043 (0.041 to 0.044 with 90% confidence), |
| SRMSR (standardized root mean square residual)= 0.042. |
| Mean absolute residual = 0.033 |

As expected, the chi-square test itself is statistically significant, but the RMSEA and especially the SRMSR and mean absolute residual are very low, indicating that the residuals are very small. Figures 2.1 and 2.2 display these residuals.

Figure 2.1
Selection Group Standardized Residual Histogram

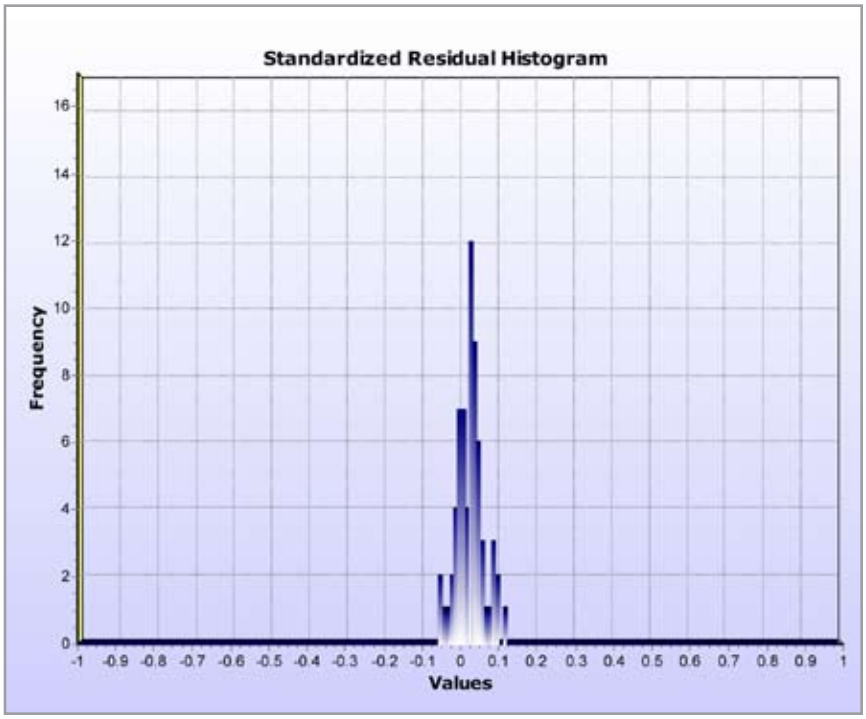
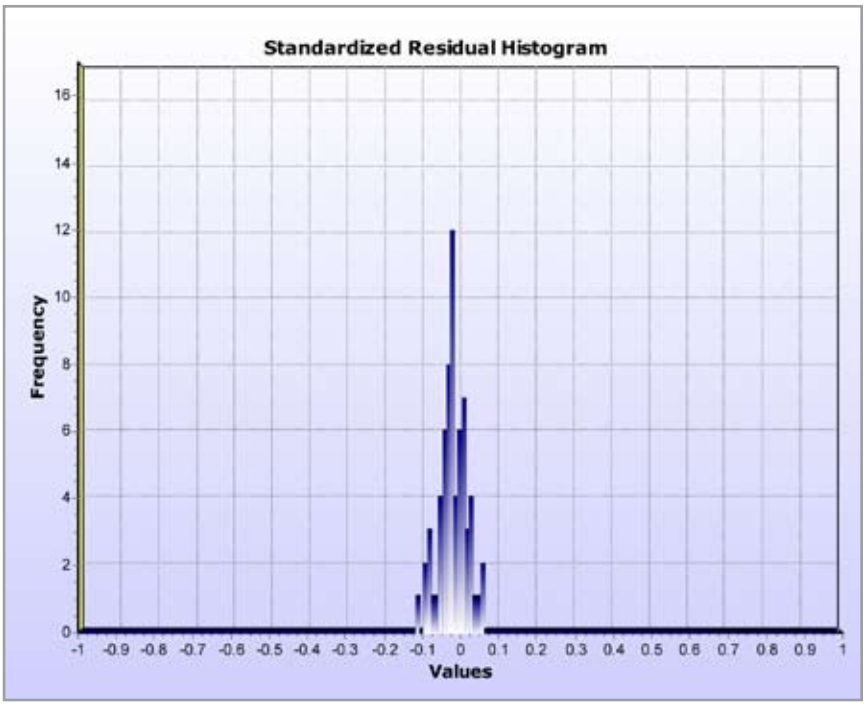


Figure 2.2
Development Group Standardized Residual Histogram




### 2.4.5 Comparison of Development and Selection Group Component Factor Analysis Solutions

Considering the precedent of the principal component factor analysis reported in Table 2.4 of the 1997 HDS manual, we elected to retain this approach to the structural psychometric analysis of the Development and Selection group data. Accordingly, we extracted three factors from the respective group datasets, orthogonally rotated the solution to simple structure for the Development group using Varimax procedures, and rotated the Selection group factor matrix against this target solution using the Orthosim-2 (Barrett, 2005a) orthogonal Procrustes algorithm. Table 2.3 presents the target and maximally congruent Selection group matrices of component factor loadings. For comparison purposes, we also present the factor solution from Table 2.4 in the 1997 HDS manual.

The overall solution factor similarity congruence coefficient is 0.98, with a double-scaled Euclidean similarity coefficient of 0.96. A value of 1.0 for each coefficient represents perfect agreement between the solutions, a value of zero represents no agreement. It is clear from this table and matching indices that the factor solutions are highly similar to one another, and to the original 1997 HDS factor solution.

Table 2.3
1997 Component Factor Solution with the Development Target and Maximally Congruent Selection Group Matrices

| | **Original 1997 Analysis Results** | | | ***Target* Development Matrix** | | | ***Congruent* Selection Matrix** | | |
|---|---|---|---|---|---|---|---|---|---|
| **HDS Scale** | Moving Away | Moving Against | Moving Toward | Moving Away | Moving Against | Moving Toward | Moving Away | Moving Against | Moving Toward |
| **Excitable** | .81 | | | .75 | | | .72 | | |
| **Skeptical** | .75 | .34 | | .56 | .50 | | .63 | .49 | |
| **Cautious** | .74 | -.34 | | .71 | -.32 | | .65 | -.31 | |
| **Reserved** | .70 | | | .71 | | | .70 | | |
| **Leisurely** | .67 | | | .58 | | | .50 | .33 | |
| **Bold** | | .78 | | | .75 | | | .78 | |
| **Mischievous** | | .77 | | | .78 | | | .77 | |
| **Colorful** | -.35 | .72 | | -.34 | .70 | | -.36 | .72 | |
| **Imaginative** | | .69 | | | .70 | | | .71 | |
| **Diligent** | | | .80 | | | .72 | | | .51 |
| **Dutiful** | | | .68 | | | .74 | | | .84 |

### 2.4.6 Comparison of Development and Selection Group Nonmetric Smallest Space Analysis Solutions

As a final comparative analysis of the Development sample versus Selection sample, we thought it useful to display the structure of the data graphically, using Guttman's nonmetric smallest space analysis (Borg & Groenen, 1997; Guttman, 1968). The goal of this analysis is to represent the relationships between variables as distances within a two or three-dimensional space. In contrast to component and factor analysis, where the goal is to create components or factors as linear combinations of variables, working directly from the correlations or covariances between them, nonmetric Smallest Space Analysis (SSA) attempts to reproduce the rank-order of similarities or distances between variables while arranging them in a highly reduced dimensionality space. This has two advantages: first, metric or distributional qualities of the data are not at issue, and second, the result is an easy to understand and usually highly informative picture of the structure of data. For these reasons, this technique is used widely in ecology and marine biology as well as in marketing and consumer research applications, where visualization of data relationships is of fundamental importance. It is always the case that a nonmetric MDS solution will be able to account for data relationships in fewer dimensions than a linear factor model. Usually, two dimensions are sufficient to account for most personality questionnaire data (Hanin, Eysenck, Eysenck, & Barrett, 1991; Kline & Barrett, 1994; Maraun, 1997).

Of specific interest to us here is the comparison between the Development and Selection group datasets. Instead of using a linear correlation between HDS scales, we used the double-scaled Euclidean distance coefficient (DSE: Wellenreuther, Barrett, & Clements, 2007). Essentially, squared HDS scale score discrepancies

(on a single scale) between two individuals are standardized by the respective maximum possible squared discrepancy for each paired comparison (as with the Gower [1971] coefficient); this distance is then re-standardized by the square root of the number of individuals over which the calculations are taking place. This double transformation avoids problems with non-linear data standardization-normalization procedures by using only linear scaling, making the DSE coefficients comparable between themselves and between studies. By subtracting a DSE from 1.0, the coefficient can express similarity rather than discrepancy (DSE-S). The formula is given below.

$$\text{DSE-S} = 1 - \left[ \frac{\sqrt{\sum_{i=1}^{n} \left( \frac{(HDS_scale1_i - HDS_scale2_i)^2}{md} \right)}}{\sqrt{n}} \right] \quad \text{where}$$

$n =$ the number of individuals contributing test scores

$score =$ the HDS scale score for an individual $i$ of $n$ on scale1 and 2

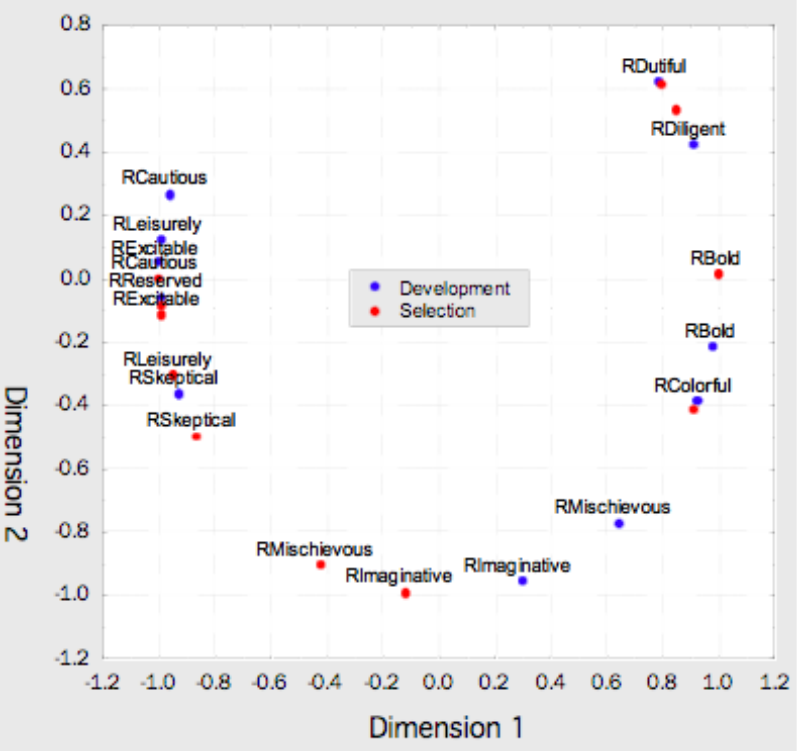
$md =$ (maximum possible HDS scale score $-$ minimum possible HDS scale score)$^2 = (14 - 0)^2$

Accordingly, two matrices of DSE-S coefficients were computed and submitted to the STATISTICA multidimensional scaling routine. Two-dimensional solutions were created for each dataset, with standardized stress (a measure of goodness of fit of reproduced versus actual rank-order distances) well below the recommended threshold of 0.20 for each solution: Development sample stress = 0.012, Selection sample = 0.017. Because the goal of this analysis is to provide a visualization of the structure of the data, while displaying both group structures simultaneously, a configural similarity analysis was undertaken using the Orthosim-2 software (Barrett, 2005a). When submitting multidimensional scaling vectors (coordinate dimensions) for comparison analysis, both matrices are initially centered (their coordinate-space origins are equated), are row-normalized (the "Procrustes" approach to express each matrix in a normalized unit metric space which preserves the distance relations), then any coordinate "reflections" are undone as part of the orthogonal rotation to maximum congruity. This is known as "configural similarity" (Borg & Groenen, 1997). The reason for these specific transformations is that MDS solutions are arbitrary in terms of their location, scale, and orientation of variables in geometric space. It is the distance relations between variables which are critical in MDS; such relations can be preserved while allowing the origin, scale, and reflection of solutions to vary. This is the reason for the extra transformations required prior to congruential rotation.

Of special interest is that the row-normalizing transformation in two-dimensions places all variables on the perimeter of a circle, while retaining the distance relations between variables. This greatly simplifies visualization of comparative data. The Development sample solution was again used as the target matrix against which maximal configural similarity was sought for the Selection data matrix. Figure 2.3 shows the resulting 2-dimensional plot of the Development and Selection group data. The overall comparative solution congruence is 0.923, with a solution DSE-S of 0.87.

Figure 2.3

Nonmetric Smallest Space Analysis and Configural Matching of Development and Selection Group HDS Scores




*Note.* The 'R' before each scale name reflects the use of raw rather then percentile scale scores.

Clearly, this data visualization shows that two datasets are closely related, although not identical.

### 2.4.7 Summary

From a careful examination of the results presented in sections 2.4.1 through 2.4.6, it is reasonable to conclude that although some differences are identifiable between the Development and Selection group datasets, these differences are trivial for all practical purposes. Therefore, the following analyses are conducted on the total combined dataset.

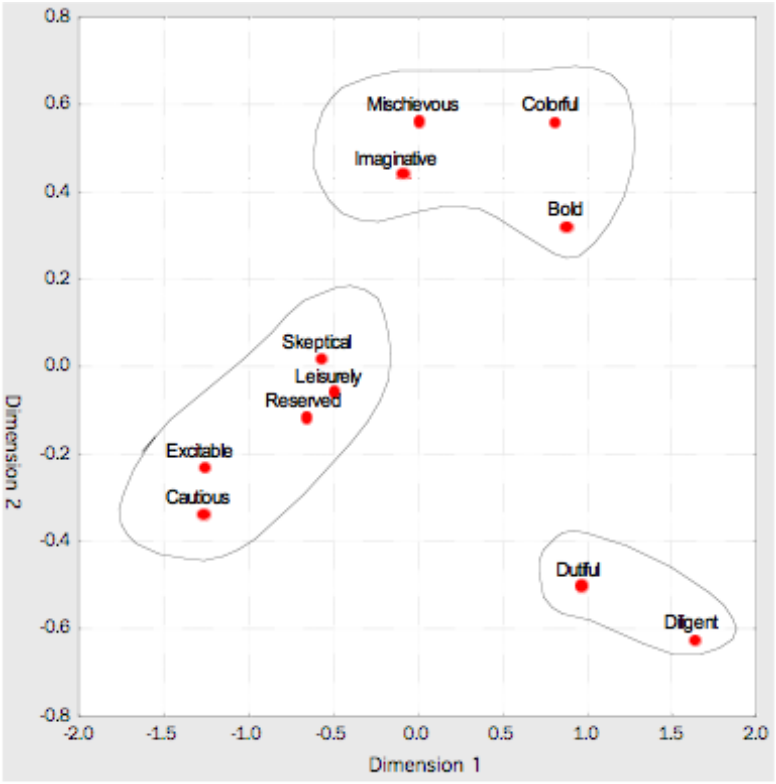
## 2.5 Structural Psychometrics of the Normative Dataset (N = 109,103)

A principal component factor analysis was undertaken on the HDS scale score entire dataset, using all cases with complete data (n=109,036). Both varimax and direct oblimin rotations were undertaken for comparative purposes. The direct oblimin oblique rotation parameter was swept from -40 to 0.5 in steps of 0.5 with the final solution chosen on the basis of the maximum hyperplane count. Maximum simple structure was found at a

parameter value of 0.000. The maximum factor correlation was just 0.11, which indicates the original varimax rotation of the component factor loadings in 1997 was justified. Table 2.4 provides the component factor loadings for each solution, with the original 1997 solution provided in the same table. The results in this table provide evidence of a close replication of the original HDS global factor solution.

Figure 2.4 provides the visualization from a nonmetric smallest space analysis of the same data using DSE-S coefficients, showing the same three global HDS components.

Figure 2.4
A Nonmetric Smallest Space Analysis Visualization of the HDS Global Components




## 2.6 Descriptive Statistics and Reliabilities for the 2008 Normative Dataset (N =109,103)

Table 2.5 presents the descriptive statistics and internal consistency reliabilities for each HDS scale. Within this table we provide two estimates of the standard error of measurement, one applicable to an observed test

Table 2.4

1997 Component Factor Solution With the 2008 Normative Sample Results (N=109,036) Using Both Varimax and Direct Oblimin Rotations

| | Moving Away | | | Moving Against | | | Moving Toward | | |
|---|---|---|---|---|---|---|---|---|---|
| **HDS Scale** | **1997 Varimax** | **Current Varimax** | **Current DirOblimin** | **1997 Varimax** | **Current Varimax** | **Current DirOblimin** | **1997 Varimax** | **Current Varimax** | **Current DirOblimin** |
| Excitable | .81 | .73 | .73 | | | | | | |
| Skeptical | .75 | .57 | .55 | .34 | .50 | .49 | | | |
| Cautious | .74 | .72 | .72 | -.34 | | | | | |
| Reserved | .70 | .70 | .72 | | | | | | |
| Leisurely | .67 | .55 | .53 | | | | | | |
| Bold | | | | .78 | .76 | .75 | | | |
| Mischievous | | | | .77 | .78 | .78 | | | |
| Colorful | -.35 | -.34 | .36 | .72 | .72 | .73 | | | |
| Imaginative | | | | .69 | .72 | .72 | | | |
| Diligent | | | | | | | .80 | .75 | .75 |
| Dutiful | | | | | | | .68 | .76 | .77 |

*Note.* 61.6% variance explained in 1997 HDS edition; 57.8% in the current normative data.

score, and one applicable to the estimated true score. We use the equation provided by Dudek (1979) to compute the standard deviation of observed scores when they are held constant:

$$sem_3 = s_T\sqrt{(1 - r_{xx}^2)}$$

where

$s_T$ = the standard deviation of the scale scores

$r_{xx}$ = the reliability of the test

As Nunnally and Bernstein (1994, pp 259-260) indicate, this is the optimal formula to estimate the standard error of measurement of observed rather than true scores, using observed scores rather than estimated true scores as the initial score estimates. The conventional formula used is:

$$sem_1 = s_T\sqrt{(1 - r_{xx})}$$

where

$s_T$ = the standard deviation of the scale scores

$r_{xx}$ = the reliability of the test

This formula is applicable for estimating a range of observed scores for a fixed true score, and not an observed score. That is, to express the likely error around an observed test score, one should use $sem_3$ rather than $sem_1$.

For example, consider an observed score on Excitable of 5, given the scale mean, standard deviation and Cronbach alpha in Table 2.5. To use sem1 as our estimate of the standard error of measurement, we would

first need to compute the estimate of the true score (for an observed score of 5), using the formula given below:

$$t' = \left(r_{xx}\left(x - \bar{x}\right)\right) + \bar{x}$$

where

$t'$ = the estimated true score

$r_{xx}$ = the reliability of the test scale

$x$ = the observed scale score

$\bar{x}$ = the global normative mean scale score

For our observed score of 5 on Excitable, we would calculate t' as:

$$t' = \left(0.63\left(5 - 2.79\right)\right) + 2.79$$

$$t' = 4.18$$

Then, we apply $sem_1$ (1.37) as our estimate of the standard error of measurement to this value of 4.18, in order to estimate a confidence interval of observed scores for this fixed true score. Given this $sem_1$, an interval within which we might expect to find 68% of all observed scores for the individual who scored 5 would extend from 3 to 6. If we had applied this $sem_1$ to the observed score of 5, we would have computed the interval as between 4 and 6.

Alternatively, if we applied $sem_3$ (1.75) to the observed score (which is the more correct method to estimate the likely range of observed scores from an initial, fixed, observed score), we would obtain the same 68% confidence interval as between 3 and 7. So, the choice of an appropriate formula can have a substantive impact on the confidence interval estimation for an individual's score.

Table 2.5

Descriptive Statistics, Reliabilities, and Standard Errors of Measurement for the HDS scales

| HDS Scale | N | Mean | SD | Cronbach alpha | Mean Inter-item Correlation | $sem_1$ | $sem_3$ |
|---|---|---|---|---|---|---|---|
| Excitable | 107271 | 2.79 | 2.25 | .63 | .12 | 1.37 | 1.75 |
| Skeptical | 107019 | 4.30 | 2.35 | .63 | .12 | 1.43 | 1.82 |
| Cautious | 107450 | 2.78 | 2.35 | .68 | .13 | 1.33 | 1.72 |
| Reserved | 107437 | 4.04 | 2.02 | .57 | .09 | 1.32 | 1.66 |
| Leisurely | 107126 | 4.49 | 1.98 | .43 | .06 | 1.49 | 1.79 |
| Bold | 106769 | 7.60 | 2.65 | .67 | .13 | 1.52 | 1.97 |
| Mischievous | 107151 | 5.65 | 2.56 | .59 | .09 | 1.64 | 2.07 |
| Colorful | 106916 | 7.29 | 2.73 | .68 | .14 | 1.54 | 2.00 |
| Imaginative | 106726 | 5.33 | 2.45 | .61 | .10 | 1.53 | 1.94 |
| Diligent | 107376 | 9.78 | 2.09 | .56 | .10 | 1.39 | 1.73 |
| Dutiful | 107169 | 8.16 | 2.10 | .46 | .05 | 1.54 | 1.86 |

*Note.* Each scale contains 14 items. $sem_1$= the standard error of measurement to be applied to the estimated true score for an individual given their observed score. $sem_3$= the standard error of measurement to be applied to the observed score for an individual.

Table 2.5 indicates that the highest mean scale scores appear for the Diligent and Dutiful scales, respectively. The lowest mean scale scores appear for the Excitable and Cautious scales. The Colorful scale is the most variable (SD = 2.73), whereas the Leisurely scale is the least variable (SD = 1.98). Internal consistency reliabilities vary between .43 (Leisurely) and .68 (Colorful) with an average alpha of .59. The $sem_1$ and $sem_3$ standard errors of measurement were consistent across all scales and averaged 1.46 and 1.85, respectively.
Table 2.6 provides the Pearson correlations between the HDS scales, using all complete-data cases in the normative dataset (n=109,036).

## 2.7 Test-Retest Reliability

The data for these analyses were drawn exclusively from working adults classified within the Manager-Executive job family, as detailed in the normative sample description in Chapter 6. Although we have test-retest data over periods extending from 1 day to 3 years or more, it is proposed that the two durations that are most practically useful for employers and users of the HDS are one day through to less than 3 months between test sessions and between 9 to 12 months. Most retesting within an organization takes place in a one year or less time-frame.

### 2.7.1 Short-Term Stability (less than 3 months)

This test-retest group consists of 169 cases, 115 males and 53 females, with one individual who not provide gender information. Eight percent designated themselves as Black, 3% as Hispanic, 2% as Asian, 1% as “2 or more races,” and 58% as White. The mean age of this group was 39.24 years with standard deviation of 9.15 years.

### 2.7.2 Long-Term Stability (between 9 to 12 months)

This test-retest group consists of 97 cases, 67 males and 29 females, with one individual who not provide gender information. Nine percent designated themselves as Black, 6% as Hispanic, 4% as Asian, 1% as “2 or more races,” and 58% as White. The mean age of this group was 37.95 years with standard deviation of 7.58 years.

Table 2.7 presents three kinds of indices which summarize the stability of the HDS scale scores. The first is the conventional Pearson correlation coefficient. However, this coefficient is sensitive to monotonicity variation between scores, and not just score magnitude differences (cf. R. Hogan & Hogan, 2007, pp. 37-38). Although previously in the HPI 2007 technical manual we used a model 2 intraclass coefficient to provide a “check” on any possible distortion in the Pearson coefficient, here we used a more direct and straightforward measure of agreement between the two scores, the Double-Scaled Euclidean similarity coefficient. This is the same coefficient used for the nonmetric smallest space analysis in Section 2.4.6 and 2.5 of this chapter except that to obtain a more precise measure of magnitude similarity, the maximum possible discrepancy observable for each scale was computed using the average of all observed maximum discrepancies of each case comparison

Table 2.6

Pearson Correlations Between the 11 HDS Scale Scores Using Complete-Case Data Within the Normative Sample (N=109,036)

| HDS Scale | EXC | SKE | CAU | RES | LEI | BOL | MIS | COL | IMA | DIL | DUT |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Excitable | 1.0 | .34 | .46 | .31 | .26 | -.04 | .01 | -.13 | .10 | .03 | .07 |
| Skeptical | | 1.0 | .19 | .29 | .36 | .34 | .35 | .09 | .32 | .16 | .0 |
| Cautious | | | 1.0 | .33 | .30 | -.16 | -.14 | -.32 | -.03 | .03 | .19 |
| Reserved | | | | 1.0 | .24 | -.04 | .03 | -.26 | .04 | .0 | -.10 |
| Leisurely | | | | | 1.0 | .23 | .16 | .01 | .20 | .15 | .12 |
| Bold | | | | | | 1.0 | .42 | .47 | .40 | .20 | .01 |
| Mischievous | | | | | | | 1.0 | .46 | .49 | -.07 | -.14 |
| Colorful | | | | | | | | 1.0 | .39 | -.07 | -.08 |
| Imaginative | | | | | | | | | 1.0 | .03 | -.01 |
| Diligent | | | | | | | | | | 1.0 | .25 |
| Dutiful | | | | | | | | | | | 1.0 |

*Note.* EXC – Excitable; SKE – Skeptic; CAU – Cautious; RES – Reserved; LEI – Leisurely; BOL – Bold; MIS – Mischievous; COL – Colorful; IMA – Imaginative; DIL – Diligent; DUT – Dutiful

for that scale. That is, the value of md for each scale reflected the fact that the maximum possible discrepancy for each case was a function of the initial occasion score (e.g., if 6, then the maximum possible discrepancy for this score would be 14-6=8). This adjustment allowed a more accurate estimation of magnitude similarity per scale than using a global fixed scaling constant of 14. The adjusted formula for this coefficient is:

$$\text{DSE-S} = 1 - \left[ \frac{\sqrt{\sum_{i=1}^{n} \left( \frac{(score_{occasion1_i} - score_{occasion2_i})^2}{md_{HDS_{scale}}} \right)}}{\sqrt{n}} \right] \quad \text{where}$$

$n =$ the number of individuals contributing test scores

$score =$ the HDS scale score for an individual $i$ of $n$ on occasion 1 and 2

$md_{HDS_{scale}} =$ average maximum possible discrepancy per HDS scale

This similarity coefficient is a measure of "absolute agreement", varying between 0 (maximum possible discrepancy) through 1 (absolute identity of scores). Such coefficients, as with the Kernel Smoothed Distance measure of agreement (Barrett, 2005b), directly indexes agreement between actual observed score magnitudes, not transformed or standardized versions of scores, and not "relative" or "monotonic agreement. This is critical for applied work where actual discrepancy or similarity of observed scores is required to be assessed.

Accompanying this second direct measure of agreement in Table 2.7 is the third "indicator", the percent of cases whose absolute score discrepancy between occasion 1 and 2 scores is less than or equal to two. This is a very useful index which allows us to gauge which of the test-retest indices is the more accurate summary of the similarity between scores. Augmenting these three types of test-retest data are the results provided in Table 2.8, which summarizes descriptive statistics for the signed score differences between occasions. If there is no bias or untoward systematic effects operating between occasion 1 and 2, such as systematic distortion or subtle potential adjustment of test scores by an individual due to possible reputation enhancement or their perceptions of how the second occasion test scores might be viewed or compared with the first, then the mean discrepancy scores should be zero with score discrepancy distributions symmetric around this estimated central parameter (with a normalized skewness of zero).

Looking at the results in Table 2.7, it is clear that there is a high degree of similarity between test scores across two occasions for both short and longer-term duration. The disparity between the sizeable percentage of cases with a only a 0-2 score range discrepancy and the reduced magnitude of the Pearson coefficient reflects the fact that the Pearson coefficient is sensitive to monotonicity between scores and not just magnitude. The DSE-S coefficients better index the agreement between the two occasion scores, reflecting the very low discrepancies across occasion (given a possible 0-14-point score range). To establish the likelihood of observing DSE-S coefficients as high as these using normally distributed random data, we created 11 separate datasets

(one for each HDS scale), each comprising 200 records of 169 "observations" using the means and SDs of the observed scores for each HDS scale occasion, with constrained integer values between 0 and 14, where each record was constructed alternating the use of the occasion 1 and occasion 2 mean and SD in the random number generator process). Then, every record was compared to every other record using the DSE-S calculation to construct the measure of agreement for each comparison. In all, 19,900 unique coefficients were generated per scale in order to provide a bootstrapped distribution of coefficients for data which closely matched that for the short term (169 observations) and longer-term (97 observations) test-retest datasets. The appropriate md scaling constant was used for each scale in the DSE-S formula for these data to ensure a common frame of reference for the bootstrap calculations. The results of these analyses indicated that none of the DSE-S coefficients in Table 7 could be observed by chance alone. All coefficients in this table exceeded the highest value observed in the 19,900 scale-characteristic-specific random dataset. As to why the DSE-S values are so high, this reflects the very narrow range of observed discrepancies between the two occasion score-sets, given the size of discrepancies which could occur.

Finally, the data in Table 2.8 confirm that almost no substantive systematic distortion has taken place between the two test occasions for either duration group. Indeed, near symmetry around zero discrepancy is indicated by most normalized skewness statistics, and all mean raw discrepancies except for Colorful (-0.70) are less than |0.5|. The test-retest data indicate good stability of scores over both short and long-term test occasions. This addresses concerns about whether test takers deliberately distort, alter or fake their responses on two substantative real world employment situations. Our conclusion, identical to that based on the HPI, is that faking on personality measures is not a significant problem in real world employment contexts (see R. Hogan, Barrett, & Hogan, 2007).

Table 2.7
Short- and Long-Term Stability Coefficients for the HDS

| | Pearson Correlations | | Normalized Euclidean Similarities (DSE-S) | | % of Cases with a 0-2 Score Range Discrepancy | |
|---|---|---|---|---|---|---|
| **HDS Scale** | **< = 3 months** | **9-12 months** | **< = 3 months** | **9-12 months** | **< = 3 months** | **9-12 months** |
| Excitable | .71 | .67 | .84 | .85 | 83% | 89% |
| Skeptical | .67 | .55 | .82 | .78 | 85% | 74% |
| Cautious | .75 | .52 | .85 | .82 | 89% | 80% |
| Reserved | .74 | .64 | .85 | .83 | 93% | 81% |
| Leisurely | .64 | .62 | .80 | .81 | 80% | 78% |
| Bold | .67 | .59 | .76 | .75 | 77% | 69% |
| Mischievous | .70 | .68 | .79 | .78 | 84% | 82% |
| Colorful | .71 | .68 | .78 | .76 | 83% | 79% |
| Imaginative | .75 | .75 | .81 | .81 | 83% | 81% |
| Diligent | .72 | .70 | .82 | .81 | 88% | 84% |
| Dutiful | .66 | .60 | .79 | .80 | 85% | 86% |

*Note.* N's vary between 167 and 169 for the short-term stability sample, and n=97 for the long-term sample

Table 2.8

Signed-Difference Descriptive Statistics for Short- and Longer Term Stability Coefficients

| | < = 3 Months Duration | | | 9-12 Months Duration | | |
|---|---|---|---|---|---|---|
| **HDS Scale** | **Mean months** | **SD** | **Skewness** | **Mean months** | **SD** | **Skewness** |
| Excitable | 0.46 | 1.83 | 0.51 | -0.10 | 2.10 | 0.06 |
| Skeptical | 0.22 | 1.91 | 1.19 | -0.30 | 1.88 | 0.15 |
| Cautious | 0.47 | 1.80 | 0.95 | 0.13 | 2.07 | -0.69 |
| Reserved | 0.20 | 1.56 | 1.03 | 0.06 | 1.62 | 0.91 |
| Leisurely | 0.04 | 2.00 | 0.47 | -0.12 | 2.10 | -0.34 |
| Bold | -0.19 | 2.30 | 0.55 | -0.48 | 2.28 | -0.40 |
| Mischievous | -0.17 | 1.93 | -0.80 | -0.27 | 2.38 | -0.33 |
| Colorful | -0.70 | 2.05 | -0.85 | -0.10 | 2.20 | -0.25 |
| Imaginative | 0.05 | 1.85 | 0.08 | -0.18 | 1.99 | -0.94 |
| Diligent | -0.26 | 1.79 | -0.19 | -0.19 | 1.92 | 0.69 |
| Dutiful | 0.12 | 1.88 | 0.46 | -0.09 | 1.72 | -0.17 |

*Note.* N's vary between 167 and 169 for the short-term stability sample, and n=97 for the long-term sample

# 3. VALIDITY

## 3.1 Construct Validity

Chapter 2 concerns the development of the HDS scales and their technical or psychometric properties--i.e., their internal consistency and temporal stability. The evidence presented in Chapter 2 suggests that these fundamental technical properties are acceptable, which leads to the next question--what do scores on the HDS scales mean?

This is the issue of validity, a topic that is much discussed but often misunderstood. Our view (cf. R. Hogan & Hogan, 1997) is that the meaning of a personality scale must be discovered--it cannot be stipulated in advance--and it must be discovered in the pattern of external non-test correlates of the scale in question (R. Hogan & Nicholson, 1988). In our view, assessment has a job to do and it is to predict significant outcomes. The more significant outcomes that can be predicted, the more useful the assessment will be. Gough's (1975) goal for the California Psychological Inventory, one of the most extensively validated assessments of personality in the history of measurement, is to predict important social outcomes. Similarly, we designed both the HPI and the HDS to predict outcomes, not to measure traits. In general, personality measures have succeeded in accomplishing this goal (Roberts, Kuncel, Shiner, Caspi, & Goldberg, 2007)

We have a theory about the content of each scale. Each scale is designed to assess a particular syndrome, a unique theme that occurs in interpersonal behavior, a theme that usually has negative implications defined in terms of a person's ability to build relationships and establish a career. Thus, the validity of the HDS scales depends not only on having robust external correlates, but also on having external correlates that make sense given our theory of each scale's content (also see R. Hogan, Hogan, & Roberts, 1996).

## 3.2 Correlations with Other Assessments

In the sections that follow, we define the syndrome each scale is intended to capture, then we review the evidence regarding the pattern of external correlates for each scale. Correlation analyses are one source of evidence for construct validity. In this section, we provide correlation matrices for three domains of psychological assessments. We provide relational results between the HDS and personality measures, values/needs/motives/interest inventories, and cognitive ability tests. Results from 10 matrices are presented in this section; additional matrices are available that are contained as part of Goldberg's (2008) Eugene-Springfield Community Sample.

### 3.2.1 Procedure

Separate studies evaluated the construct validity of the HDS scales. Data were collected as either part of archival research efforts or as part of personnel development applications. HDS data were gathered using online

internet testing in both proctored and unproctored conditions. Subjects who participated in archival research data collection were compensated for their participation; subjects who were assessed as part of a development program completed the inventories during their regular working hours. All participants received feedback from their scored assessments. No data reported here were gathered as part of high stakes testing, where hiring, promotion, or other personnel decisions were considered.

### 3.2.2 Samples and Instruments

*HPI*. First, we review HDS correlations with the Hogan Personality Inventory (HPI; R. Hogan & Hogan, 1995, 2007). Both measures were administered to 754 managers and professionals employed in private sector organizations in the US (see Table 3.1 and Appendix A). All participants were pursing corporate programs of professional development where the assessments were a component of the program. The sample included 486 males and 247 females (21 individuals did not indicate gender). Ages of subjects ranged from 19 years to 65 years with a mean of 38.27 years (SD = 9.97). All had completed a high school education and most had post-graduate training.

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

Hogan and Holland (2003, p. 104) demonstrate that the HPI is an adequate measure of the FFM. Median correlations with other FFM inventories range from .30 to .69. The HPI is a well-established measure that predicts job performance and does not result in adverse impact. Further, faking on the HPI (or other personality measures used for personnel decisions) is not a significant problem (R. Hogan, Barrett, & Hogan, 2007).

*CPI*. Second, we review HDS correlations with the California Psychological Inventory (CPI; Gough, 1996; see Table 3.2). Data for these correlations were obtained through the longitudinal Eugene-Springfield Community Sample conducted by Dr. Lewis Goldberg. Dr. Goldberg recruited approximately 1,000 individuals to participate in the project. However, because data were collected on 30 different assessments, only a portion of this sample completed the CPI. In addition, the sample was limited to participants who completed both the HDS and the CPI, resulting in a sample of 149 individuals. The sample included 62 males and 87 females. Ages of subjects ranged from 18 years to 75 years with a mean of 47.96 years (SD = 11.20).

The CPI is a 434-item true-false measure of personality and behavior. The CPI is normed on 52 male and 42 female samples. These norming samples include a high school sample, college sample, graduate and professional school sample, and occupational samples. The CPI contains twenty folk and three vector scales. The twenty folk scales are Dominance (Do), Capacity for Status (Cs), Sociability (Sy), Social Presence (Sp), Self-acceptance (Sa), Independence (In), Empathy (Em), Responsibility (Re), Socialization (So), Self-control (Sc), Good Impression (GI), Communality (Cm), Well-being (Wb), Tolerance (To), Achievement via Conformance (Ac), Achievement via Independence (Ai), Intellectual Efficiency (Ie), Psychological-mindedness (Py), Flexibility (Fx), and Femininity/Masculinity (F/M). The three vector scales are Externality/Internality (v.1), Norm-doubting/Norm-favoring (v.2), and Ego-integration (v.3). The technical features including reliability, factor analysis, and validity are presented in Gough (1996).

*NEO PI-R.* Third, we review HDS correlations with the NEO PI-R (Costa & McCrae, 1992; see Table 3.3). Data for these correlations were obtained through the longitudinal Eugene-Springfield Community study conducted by Dr. Lewis Goldberg. Dr. Goldberg recruited approximately 1,000 individuals to participate in the project. However, only a portion of this sample completed the NEO PI-R due to the fact that data were collected on 30 different assessments. In addition, data were limited to participants who completed the HDS and the NEO PI-R, resulting in a sample of 146 individuals. The sample included 59 males and 87 females. Ages of subjects ranged from 18 years to 75 years with a mean of 48.23 years (SD = 11.10).

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

*IPIP.* Fourth, we review HDS correlations with the International Personality Item Pool (IPIP; Goldberg, Johnson, Eber, Hogan, Ashton, Cloninger, & Gough, 2006; see Table 3.4). Data for these correlations were obtained through the longitudinal Eugene-Springfield Community study conducted by Dr. Lewis Goldberg (Goldberg, 2008; Grucza & Goldberg, 2007). Dr. Goldberg recruited approximately 1,000 individuals to participate in the project; however, only a portion of this sample completed the IPIP because data were collected on 30 different

assessments. In addition, data were limited to participants who completed the HDS and the IPIP, resulting in a sample of 128 individuals. The sample included 53 males and 75 females. Ages of subjects ranged from 18 years to 75 years with a mean of 48.12 years (SD = 11.10).

The International Personality Item Pool (Goldberg, 1999; Goldberg, et al., 2006) is an online pool of over 2,000 items assessing personality. The purpose of IPIP is to continuously develop and refine personality inventories. The IPIP is available for anyone to contribute and/or use items. Currently, 269 scales can be created from the available items. The IPIP and corresponding scales are updated regularly to use new and refined items. Norms for the IPIP are not available; the authors argue they would be misleading. However, users of the IPIP are told that local norms can be created based on one's own sample. For the correlations presented here, the following scales were used: Extraversion (EXT), Agreeableness (AGR), Conscientiousness (CON), Emotional Stability (EMS), and Intellect/Imagination (I/I). The technical features, including scale construction and validity indices, are presented in Goldberg et al. (2006) and at http://ipip.ori.org.

*16PF.* Fifth, we review HDS correlations with the Sixteen Personality Factor Questionnaire (16PF; Conn & Rieke, 1994; Russell & Karol, 2002; see Table 3.5). Data for these correlations were obtained through the longitudinal Eugene-Springfield Community study conducted by Dr. Lewis Goldberg. Dr. Goldberg recruited approximately 1,000 individuals to participate in the project; however, only a portion of this sample completed the 16PF because data were collected on 30 different assessments. In addition, data were limited to participants who completed the HDS and the 16PF, resulting in a sample of 145 individuals. The sample included 62 males and 83 females. Ages of subjects ranged from 18 years to 75 years with a mean of 47.82 years (SD = 11.31).

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

*MVPI.* Sixth, we review HDS correlations with the Motives, Values, Preferences Inventory (MVPI; J. Hogan & Hogan, 1996). Both measures were administered to 753 managers and professionals employed in private sector organizations in the US (see Table 3.6). All participants were pursing corporate programs of professional development where the assessments were a component of the program. The sample included 486 males and

247 females (20 individuals did not indicate their gender). Ages of subjects ranged from 19 years to 65 years with a mean of 38.27 years (SD = 9.97). All had completed a high school education and most had post-graduate training.

The MVPI is a 200-item measure of motives, values, and preferences with the goal of evaluating fit between an individual and an organization. A second goal of the MVPI is to assess a person's motives directly. For example, is a person motivated by money, security or fun? The MVPI is normed on 3,015 adults, most of whom are employees or job applicants (J. Hogan & Hogan, 1996). The MVPI contains ten scales: Aesthetic (AES), Affiliation (AFF), Altruistic (ALT), Commercial (COM), Hedonistic (HED), Power (POW), Recognition (REC), Scientific (SCI), Security (SEC), and Tradition (TRA). Each scale was constructed to reflect five themes: Lifestyles, Beliefs, Occupational Preferences, Aversions, and Preferred Associations. The technical features including item content, reliability, factor analysis, and validity are presented in J. Hogan and Hogan (1996).

*CISS.* Seventh, we review HDS correlations with the Campbell Interest and Skill Survey (CISS; Campbell, Hyne, & Nilsen, 1992; see Table 3.7). Data for these correlations were obtained through the longitudinal Eugene-Springfield Community study conducted by Dr. Lewis Goldberg. Dr. Goldberg recruited approximately 1,000 individuals to participate in the project; however, only a portion of this sample completed the CISS because data were collected on 30 different assessments. In addition, data were limited to participants who completed the HDS and the CISS, resulting in a sample of 126 individuals. The sample included 55 males and 71 females. Ages of subjects ranged from 18 years to 75 years with a mean of 48.17 years (SD = 11.17).

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

*JPI-R.* Eighth, we review HDS correlations with the Jackson Personality Inventory - Revised (JPI-R; Jackson, 1994; see Table 3.8). Data for these correlations were obtained through the longitudinal Eugene-Springfield Community study conducted by Dr. Lewis Goldberg. Dr. Goldberg recruited approximately 1,000 individuals to participate in the project; however, only a portion of this sample completed the JPI-R because data were collected on 30 different assessments. In addition, data were limited to participants who completed the HDS and the JPI-R, resulting in a sample of 155 individuals. The sample included 68 males and 87 females. Ages of subjects ranged from 18 years to 75 years with a mean of 47.65 years (SD = 11.30).

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

*HBRI.* Next, we review HDS correlations with the Hogan Business Reasoning Inventory (HBRI; R. Hogan, Barrett, & Hogan, 2007). Both measures were administered to 755 managers and professionals employed in private sector organizations in the US (see Table 3.9). All participants were pursing corporate programs of professional development where the assessments were a component of the program. The sample included 487 males and 247 females (21 individuals did not indicate their gender). Ages of subjects ranged from 19 years to 65 years with a mean of 38.27 years (SD = 9.97). All had completed a high school education and most had post-graduate training.

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

*Watson-Glaser.* Finally, we review HDS correlations with the Watson-Glaser Critical Thinking Appraisal subtests and total test scores (Watson-Glaser; Watson & Glaser, 1980, 2002; see Table 3.10). Both measures were administered to 598 managers in the national transportation industry. The sample included 453 males and 116 females. Ages of subjects ranged from 20 years to 55 years with a mean of 27.52 years (SD = 6.70).

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

Table 3.1

Correlations Between HDS Scales and HPI Scales

| Scale | EXC | SKE | CAU | RES | LEI | BOL | MIS | COL | IMA | DIL | DUT |
|---|---|---|---|---|---|---|---|---|---|---|---|
| ADJ | -.71 | -.53 | -.45 | -.26 | -.35 | -.15 | -.15 | -.13 | -.28 | -.12 | -.12 |
| AMB | -.46 | -.23 | -.68 | -.38 | -.31 | .14 | .11 | .28 | .01 | .00 | -.28 |
| SOC | .00 | .16 | -.25 | -.29 | .12 | .32 | .47 | .61 | .42 | .01 | .04 |
| INP | -.43 | -.33 | -.32 | -.50 | -.17 | .04 | .03 | .18 | -.02 | .03 | .14 |
| PRU | -.36 | -.36 | -.13 | -.22 | -.20 | -.10 | -.39 | -.24 | -.38 | .31 | .14 |
| INQ | -.11 | .09 | -.20 | -.13 | .01 | .23 | .35 | .26 | .33 | .09 | -.03 |
| LRN | -.12 | .00 | -.14 | -.06 | -.01 | .15 | .08 | .14 | .05 | -.02 | -.09 |

*Note*. N =754; EXC – Excitable; SKE – Skeptical; CAU – Cautious; RES – Reserved; LEI – Leisurely; BOL – Bold; MIS – Mischievous; COL – Colorful; IMA – Imaginative; DIL – Diligent; DUT – Dutiful; ADJ – Adjustment; AMB – Ambition; SOC – Sociability; INP – Interpersonal Sensitivity; PRU – Prudence; INQ – Inquisitive; LRN – Learning Approach; Correlations ≥ .09 are significant at $\rho < .05$ (two-tailed).

Table 3.2

Correlations Between HDS Scales and CPI Scales

| Scale | EXC | SKE | CAU | RES | LEI | BOL | MIS | COL | IMA | DIL | DUT |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Dominance | -.44 | -.17 | -.65 | -.25 | -.10 | .45 | .30 | .48 | .22 | .05 | -.41 |
| Capacity for Status | -.33 | -.25 | -.47 | -.24 | -.13 | .12 | .16 | .40 | .31 | -.19 | -.23 |
| Sociability | -.34 | -.26 | -.61 | -.43 | -.27 | .26 | .27 | .62 | .16 | -.09 | -.21 |
| Social Presence | -.25 | -.19 | -.54 | -.30 | -.23 | .18 | .23 | .49 | .24 | -.19 | -.22 |
| Self-Acceptance | -.24 | -.17 | -.62 | -.35 | -.10 | .35 | .37 | .54 | .29 | -.07 | -.40 |
| Independence | -.44 | -.18 | -.61 | .07 | -.08 | .22 | .27 | .23 | .27 | -.11 | -.49 |
| Empathy | -.28 | -.25 | -.45 | -.37 | -.21 | .21 | .12 | .44 | .27 | -.17 | -.24 |
| Responsibility | -.35 | -.40 | -.15 | -.23 | -.14 | -.02 | -.14 | .08 | -.29 | .01 | .07 |
| Socialization | -.39 | -.31 | -.07 | -.12 | -.12 | .02 | -.16 | .02 | -.44 | .02 | .17 |
| Self-Control | -.52 | -.25 | -.10 | .09 | -.17 | -.21 | -.28 | -.24 | -.40 | -.03 | .00 |
| Good Impression | -.58 | -.22 | -.28 | -.05 | -.23 | -.05 | -.20 | -.07 | -.28 | .00 | -.04 |
| Communality | -.15 | .04 | -.15 | -.13 | -.06 | .09 | .15 | .10 | -.01 | .02 | -.01 |
| Well-Being | -.54 | -.36 | -.41 | -.05 | -.34 | -.06 | -.05 | .02 | -.16 | -.18 | -.17 |
| Tolerance | -.37 | -.50 | -.20 | -.22 | -.29 | -.19 | -.26 | .07 | -.24 | -.21 | -.04 |
| Achievement via Conformance | -.46 | -.28 | -.24 | -.11 | -.09 | .09 | -.10 | .09 | -.26 | .10 | -.01 |
| Achievement via Independence | -.37 | -.37 | -.29 | -.12 | -.18 | -.06 | -.11 | .06 | .03 | -.15 | -.26 |
| Intellectual Efficiency | -.40 | -.37 | -.41 | -.11 | -.11 | .01 | .03 | .15 | .07 | -.18 | -.27 |
| Psychological-Mindedness | -.44 | -.35 | -.25 | -.02 | -.11 | -.04 | -.04 | .03 | .09 | -.18 | -.20 |
| Flexibility | -.12 | -.34 | -.08 | -.17 | -.22 | -.19 | -.03 | .13 | .23 | -.49 | -.07 |
| Femininity/Masculinity | .24 | -.03 | .37 | -.32 | .01 | -.07 | -.29 | .06 | -.19 | .03 | .24 |
| Externality/Internality | .25 | .14 | .59 | .29 | .08 | -.47 | -.40 | -.63 | -.34 | -.02 | .35 |
| Norm-Doubting/ Norm-Favoring | -.32 | -.09 | -.17 | -.10 | -.02 | .22 | .00 | .14 | -.34 | .29 | .12 |
| Ego-Integration | -.49 | -.43 | -.26 | -.10 | -.26 | -.16 | -.25 | -.02 | -.12 | -.24 | -.14 |

*Note*. N =149; EXC – Excitable; SKE – Skeptical; CAU – Cautious; RES – Reserved; LEI – Leisurely; BOL – Bold; MIS – Mischievous; COL – Colorful; IMA – Imaginative; DIL – Diligent; DUT – Dutiful; Correlations ≥ .16 are significant at $\rho < .05$ (two-tailed).

Table 3.3

Correlations Between HDS Scales and NEO PI-R Scales/Facets

| Scale | EXC | SKE | CAU | RES | LEI | BOL | MIS | COL | IMA | DIL | DUT |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Neuroticism | .56 | .21 | .52 | -.04 | .21 | -.05 | -.08 | -.09 | .06 | .08 | .28 |
| Anxiety | .47 | .21 | .50 | -.09 | .17 | -.06 | -.12 | -.03 | -.03 | .05 | .26 |
| Angry Hostility | .45 | .28 | .19 | -.01 | .13 | .14 | .09 | .02 | .18 | .15 | .05 |
| Depression | .57 | .22 | .50 | .02 | .21 | -.09 | -.03 | -.15 | .08 | .04 | .19 |
| Self-Consciousness | .43 | .15 | .62 | .09 | .27 | -.11 | -.16 | -.25 | -.10 | .08 | .37 |
| Impulsiveness | .33 | .04 | .15 | -.15 | .07 | -.02 | -.03 | .04 | .22 | -.03 | .12 |
| Vulnerability | .38 | .07 | .49 | -.06 | .12 | -.10 | -.13 | -.07 | -.10 | .08 | .36 |
| Extraversion | -.23 | -.09 | -.44 | -.51 | -.25 | .30 | .27 | .55 | .25 | -.03 | -.09 |
| Warmth | -.17 | -.14 | -.22 | -.55 | -.20 | .18 | .07 | .43 | .19 | -.14 | .08 |
| Gregariousness | -.11 | -.08 | -.24 | -.50 | -.31 | .14 | .12 | .42 | -.07 | -.02 | .08 |
| Assertiveness | -.27 | -.05 | -.59 | -.30 | -.14 | .34 | .28 | .45 | .26 | .07 | -.37 |
| Activity | -.26 | -.07 | -.31 | -.24 | -.05 | .23 | .22 | .36 | .17 | .07 | -.22 |
| Excitement-Seeking | .07 | .18 | -.15 | -.13 | -.13 | .22 | .35 | .28 | .23 | .05 | .07 |
| Positive Emotions | -.20 | -.19 | -.25 | -.37 | -.19 | .10 | .05 | .32 | .22 | -.14 | .00 |
| Openness | .01 | -.05 | -.19 | -.14 | .00 | .06 | .15 | .17 | .49 | -.16 | -.17 |
| Fantasy | .11 | -.05 | -.08 | -.12 | .03 | .05 | .09 | .12 | .46 | -.20 | -.15 |
| Aesthetics | .08 | -.06 | -.01 | -.12 | .01 | .04 | .09 | .12 | .37 | -.05 | -.02 |
| Feelings | .16 | .05 | -.04 | -.32 | .03 | .12 | .06 | .26 | .35 | -.01 | .02 |
| Actions | -.15 | -.12 | -.29 | -.18 | -.25 | -.05 | .25 | .18 | .34 | -.22 | -.25 |
| Ideas | -.03 | .08 | -.25 | .10 | .14 | .22 | .24 | .07 | .37 | .05 | -.28 |
| Values | -.13 | -.12 | -.16 | .00 | -.02 | -.11 | -.08 | .00 | .16 | -.23 | -.04 |
| Agreeableness | -.25 | -.28 | .12 | -.11 | -.06 | -.14 | -.23 | -.13 | -.22 | -.02 | .25 |
| Trust | -.36 | -.33 | -.20 | -.11 | -.18 | .02 | -.11 | .10 | -.04 | -.04 | .10 |
| Straight-forwardness | -.20 | -.20 | .11 | -.01 | -.04 | -.20 | -.26 | -.20 | -.24 | .03 | .19 |
| Altruism | -.22 | -.19 | -.04 | -.29 | -.13 | .06 | -.08 | .11 | -.05 | -.11 | .17 |
| Compliance | -.30 | -.33 | .16 | .02 | .01 | -.24 | -.18 | -.11 | -.29 | -.01 | .21 |
| Modesty | .08 | .00 | .31 | .02 | .07 | -.17 | -.16 | -.29 | -.24 | .00 | .19 |
| Tender-Mindedness | .06 | -.06 | .12 | -.12 | .05 | .05 | -.09 | -.08 | .04 | .02 | .12 |
| Conscientiousness | -.36 | -.04 | -.31 | -.01 | -.03 | .28 | .03 | .05 | -.08 | .45 | -.15 |
| Competence | -.41 | -.15 | -.38 | -.04 | -.17 | .22 | -.01 | .04 | -.02 | .14 | -.28 |
| Order | -.11 | -.02 | -.16 | -.03 | -.01 | .20 | .05 | -.01 | -.13 | .47 | -.04 |
| Dutifulness | -.20 | .05 | -.17 | .03 | .00 | .19 | -.04 | .03 | -.14 | .34 | .00 |
| Achievement Striving | -.26 | .02 | -.27 | .00 | .07 | .40 | .17 | .18 | .14 | .43 | -.19 |
| Self-Discipline | -.40 | -.08 | -.35 | -.01 | -.10 | .21 | .04 | .08 | .00 | .37 | -.20 |
| Deliberation | -.26 | -.01 | -.07 | .00 | .04 | .01 | -.11 | -.11 | -.20 | .20 | .03 |

*Note.* N =146; EXC – Excitable; SKE – Skeptical; CAU – Cautious; RES – Reserved; LEI – Leisurely; BOL – Bold; MIS – Mischievous; COL – Colorful; IMA – Imaginative; DIL – Diligent; DUT – Dutiful; Correlations ≥ .16 are significant at $\rho < .05$ (two-tailed).

Table 3.4

Correlations Between HDS Scales and IPIP Big 5 20-Item Scales

| Scale | EXC | SKE | CAU | RES | LEI | BOL | MIS | COL | IMA | DIL | DUT |
|---|---|---|---|---|---|---|---|---|---|---|---|
| EXT | -.32 | -.20 | -.61 | -.54 | -.29 | .30 | .18 | .62 | .20 | -.06 | -.20 |
| AGR | -.20 | -.18 | -.09 | -.48 | -.09 | .15 | -.06 | .29 | .04 | -.04 | .18 |
| CON | -.27 | -.02 | -.25 | -.09 | .02 | .29 | .00 | .06 | -.06 | .61 | .00 |
| EMS | -.57 | -.28 | -.36 | .04 | -.18 | .00 | .02 | .05 | .01 | -.11 | -.08 |
| I/I | -.14 | -.05 | -.32 | -.12 | .14 | .36 | .19 | .20 | .4 5 | .13 | -.28 |

*Note*. N =128; EXC – Excitable; SKE – Skeptical; CAU – Cautious; RES – Reserved; LEI – Leisurely; BOL – Bold; MIS – Mischievous; COL – Colorful; IMA – Imaginative; DIL – Diligent; DUT – Dutiful; EXT – Extraversion; AGR – Agreeableness; CON – Conscientiousness; EMS – Emotional Stability; I/I – Intellect/Imagination; Correlations ≥ .10 are significant at ρ < .05 (two-tailed).

Table 3.5

Correlations Between HDS Scales and 16PF Scales

| Scale | EXC | SKE | CAU | RES | LEI | BOL | MIS | COL | IMA | DIL | DUT |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Warmth | -.07 | -.06 | -.17 | -.46 | -.22 | .14 | .01 | .37 | .01 | -.04 | .16 |
| Reasoning | -.14 | -.19 | -.06 | .13 | .00 | -.03 | .02 | .00 | .08 | -.07 | -.13 |
| Emotional Stability | -.56 | -.16 | -.49 | -.09 | -.28 | .12 | .10 | .18 | -.01 | .01 | -.08 |
| Dominance | -.08 | .30 | -.52 | .05 | .02 | .39 | .36 | .28 | .31 | .19 | -.35 |
| Liveliness | -.01 | -.07 | -.27 | -.44 | -.25 | .16 | .19 | .38 | .06 | -.20 | .05 |
| Rule-Consciousness | -.10 | -.05 | .09 | -.18 | -.08 | .06 | -.17 | -.01 | -.33 | .22 | .15 |
| Social-Boldness | -.37 | -.20 | -.60 | -.42 | -.23 | .28 | .22 | .61 | .12 | -.07 | -.27 |
| Sensitivity | .18 | -.15 | .18 | -.31 | -.06 | -.14 | -.22 | .07 | .03 | -.20 | .12 |
| Vigilance | .23 | .49 | .17 | .14 | .26 | .15 | .16 | -.15 | .21 | .07 | .01 |
| Abstractedness | .26 | .15 | .03 | .14 | .29 | .11 | .25 | .15 | .51 | -.14 | -.17 |
| Privateness | .13 | .14 | .35 | .44 | .31 | -.08 | .01 | -.37 | -.02 | .00 | .04 |
| Apprehension | .37 | .13 | .53 | .01 | .28 | -.01 | -.14 | -.13 | -.09 | .07 | .27 |
| Openness to Change | -.15 | -.04 | -.38 | -.11 | -.02 | .21 | .28 | .20 | .48 | -.02 | -.31 |
| Self-Reliance | .08 | .11 | .17 | .46 | .42 | -.05 | -.06 | -.17 | .14 | .08 | -.19 |
| Perfectionism | -.20 | -.05 | -.12 | -.03 | -.01 | .20 | -.12 | -.02 | -.19 | .55 | -.03 |
| Tension | .25 | .19 | .14 | .09 | .23 | .15 | .06 | -.01 | -.08 | .13 | -.02 |

*Note*. N =145; EXC – Excitable; SKE – Skeptical; CAU – Cautious; RES – Reserved; LEI – Leisurely; BOL – Bold; MIS – Mischievous; COL – Colorful; IMA – Imaginative; DIL – Diligent; DUT – Dutiful; Correlations ≥ .17 are significant at ρ < .05 (two-tailed).

Table 3.6

Correlations Between HDS Scales and MVPI Scales

| Scale | EXC | SKE | CAU | RES | LEI | BOL | MIS | COL | IMA | DIL | DUT |
|---|---|---|---|---|---|---|---|---|---|---|---|
| AES | .10 | .11 | .01 | .01 | .13 | .20 | .27 | .21 | .36 | -.05 | -.02 |
| AFF | -.16 | -.03 | -.31 | -.57 | .01 | .25 | .27 | .44 | .20 | -.07 | .02 |
| ALT | -.05 | -.06 | -.04 | -.25 | .04 | .13 | .04 | .13 | .17 | .13 | .16 |
| COM | .05 | .31 | -.10 | -.01 | .18 | .40 | .26 | .23 | .16 | .32 | .01 |
| HED | .23 | .39 | .20 | .04 | .33 | .33 | .42 | .30 | .36 | .00 | .13 |
| POW | .07 | .37 | -.16 | .03 | .24 | .59 | .43 | .42 | .34 | .25 | -.10 |
| REC | .30 | .45 | .07 | -.06 | .35 | .57 | .42 | .51 | .45 | .14 | .11 |
| SCI | -.01 | .21 | .00 | .05 | .14 | .28 | .26 | .12 | .21 | .17 | .02 |
| SEC | .14 | .15 | .24 | .07 | .20 | .09 | -.30 | -.16 | -.15 | .47 | .32 |
| TRA | -.03 | -.01 | .04 | -.09 | .03 | .09 | -.16 | .02 | -.02 | .23 | .10 |

*Note.* N =753; EXC – Excitable; SKE – Skeptical; CAU – Cautious; RES – Reserved; LEI – Leisurely; BOL – Bold; MIS – Mischievous; COL – Colorful; IMA – Imaginative; DIL – Diligent; DUT – Dutiful; AES – Aesthetics; AFF – Affiliation; ALT – Altruistic; COM – Commerce; HED – Hedonism; POW – Power; REC – Recognition; SCI – Science; SEC – Security; TRA – Tradition; Correlations ≥ .07 are significant at $\rho < .05$ (two-tailed).

Table 3.7

Correlations Between HDS Scales and CISS Interest and Skill Scales

| CISS Interest Scales | EXC | SKE | CAU | RES | LEI | BOL | MIS | COL | IMA | DIL | DUT |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Influencing | -.09 | .06 | -.32 | -.01 | .02 | .36 | .23 | .28 | .17 | .05 | -.13 |
| Organizing | .03 | .15 | -.04 | .11 | .03 | .18 | .07 | -.01 | -.01 | .21 | .05 |
| Helping | -.01 | -.13 | -.05 | -.20 | -.05 | .11 | -.07 | .19 | -.03 | .05 | .17 |
| Creating | .13 | -.09 | .04 | -.26 | .05 | .12 | .11 | .23 | .15 | -.12 | .03 |
| Analyzing | -.05 | .04 | -.08 | .28 | .07 | .11 | .03 | -.14 | .00 | .26 | -.04 |
| Producing | -.04 | .03 | -.07 | .24 | .04 | .00 | .14 | -.11 | .10 | .02 | .01 |
| Adventuring | -.13 | .03 | -.25 | .16 | -.09 | .23 | .28 | .16 | .03 | .14 | -.03 |
| **CISS Skill Scales** | **EXC** | **SKE** | **CAU** | **RES** | **LEI** | **BOL** | **MIS** | **COL** | **IMA** | **DIL** | **DUT** |
| Influencing | -.08 | -.03 | -.39 | -.01 | -.03 | .36 | .27 | .34 | .28 | .05 | -.17 |
| Organizing | .01 | .18 | -.17 | .17 | .10 | .26 | .16 | .15 | .14 | .26 | -.12 |
| Helping | -.05 | -.14 | -.18 | -.18 | -.03 | .15 | .07 | .30 | .11 | .02 | .00 |
| Creating | .01 | -.09 | -.11 | -.16 | .01 | .20 | .24 | .32 | .26 | .05 | -.06 |
| Analyzing | -.08 | .07 | -.21 | .26 | .04 | .19 | .11 | -.02 | .11 | .20 | -.23 |
| Producing | -.04 | .08 | -.15 | .30 | .02 | .06 | .20 | -.07 | .20 | .08 | -.09 |
| Adventuring | -.11 | .10 | -.27 | .19 | -.02 | .29 | .36 | .13 | .25 | .14 | -.07 |

*Note.* N =126; EXC – Excitable; SKE – Skeptical; CAU – Cautious; RES – Reserved; LEI – Leisurely; BOL – Bold; MIS – Mischievous; COL – Colorful; IMA – Imaginative; DIL – Diligent; DUT – Dutiful; Correlations ≥ .18 are significant at $\rho < .05$ (two-tailed).

Table 3.8

Correlations Between HDS Scales and JPI-R Scales

| Scale | EXC | SKE | CAU | RES | LEI | BOL | MIS | COL | IMA | DIL | DUT |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Analytical Cluster | | | | | | | | | | | |
| Complexity | .06 | -.03 | -.07 | -.03 | .12 | .09 | .05 | .11 | .34 | -.09 | -.23 |
| Breadth of Interest | -.20 | -.06 | -.23 | -.09 | -.08 | .15 | .19 | .16 | .33 | .00 | -.17 |
| Innovation | -.08 | .14 | -.39 | -.10 | .09 | .36 | .29 | .33 | .47 | .09 | -.34 |
| Tolerance | -.21 | -.23 | -.35 | -.20 | -.21 | .08 | .14 | .20 | .17 | -.17 | -.16 |
| Emotional Cluster | | | | | | | | | | | |
| Empathy | .07 | -.11 | .11 | -.47 | -.13 | -.03 | -.18 | .11 | -.11 | .03 | .15 |
| Anxiety | .46 | .12 | .45 | -.10 | .14 | -.07 | -.17 | -.03 | -.01 | .03 | .20 |
| Cooperativeness | .24 | -.01 | .37 | -.23 | .05 | -.06 | -.14 | .03 | -.27 | .09 | .51 |
| Extroverted Cluster | | | | | | | | | | | |
| Sociability | -.10 | -.08 | -.23 | -.57 | -.29 | .16 | .09 | .42 | -.01 | -.06 | .09 |
| Social Confidence | -.34 | -.09 | -.69 | -.39 | -.20 | .45 | .33 | .63 | .29 | .02 | -.35 |
| Energy Level | -.41 | -.15 | -.46 | -.06 | -.06 | .32 | .19 | .33 | .18 | .15 | -.24 |
| Opportunistic Cluster | | | | | | | | | | | |
| Social Astuteness | .21 | .09 | .01 | -.07 | .19 | .20 | .30 | .30 | .32 | .03 | .08 |
| Risk Taking | -.05 | .19 | -.31 | .28 | -.03 | .16 | .44 | .22 | .41 | .00 | -.23 |
| Dependable Cluster | | | | | | | | | | | |
| Organization | -.22 | .01 | -.15 | -.13 | .00 | .22 | -.06 | .03 | -.27 | .47 | -.06 |
| Traditional Values | -.02 | .05 | .10 | -.05 | -.04 | .04 | .01 | -.03 | -.26 | .20 | .14 |
| Responsibility | -.24 | -.19 | -.09 | -.32 | -.22 | .08 | -.16 | -.05 | -.23 | .11 | .17 |

*Note.* N =155; EXC – Excitable; SKE – Skeptical; CAU – Cautious; RES – Reserved; LEI – Leisurely; BOL – Bold; MIS – Mischievous; COL – Colorful; IMA – Imaginative; DIL – Diligent; DUT – Dutiful; Correlations ≥ .16 are significant at $\rho < .05$ (two-tailed).

Table 3.9

Correlations Between HDS Scales and HBRI Scales

| Scale | EXC | SKE | CAU | RES | LEI | BOL | MIS | COL | IMA | DIL | DUT |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Tactical | -.11 | -.16 | -.05 | .01 | -.11 | -.11 | -.05 | -.02 | -.07 | -.13 | -.03 |
| Strategic | -.11 | -.13 | -.12 | -.02 | -.14 | -.10 | .01 | .01 | -.05 | -.09 | -.11 |

*Note.* N =755; EXC – Excitable; SKE – Skeptical; CAU – Cautious; RES – Reserved; LEI – Leisurely; BOL – Bold; MIS – Mischievous; COL – Colorful; IMA – Imaginative; DIL – Diligent; DUT – Dutiful; Correlations ≥ .07 are significant at $\rho < .05$ (two-tailed).

Table 3.10

Correlations between HDS Scales and Watson-Glaser Scales

| Scales | EXC | SKE | CAU | RES | LEI | BOL | MIS | COL | IMA | DIL | DUT |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Inference | -.01 | -.04 | .03 | -.03 | .00 | -.03 | .01 | .01 | .05 | -.03 | -.01 |
| Recognition of Assumptions | -.01 | .01 | .08 | .04 | -.02 | -.01 | .05 | .05 | .03 | -.06 | -.05 |
| Deduction | .01 | -.02 | .02 | -.03 | -.04 | .01 | .04 | .03 | .02 | -.11 | -.06 |
| Interpretation | .03 | -.08 | .02 | .04 | -.05 | -.06 | .03 | -.05 | .04 | -.14 | -.05 |
| Evaluation of Arguments | .00 | -.02 | .00 | -.01 | .01 | .06 | .12 | .10 | .05 | -.05 | .03 |
| TOTAL SCORE | .00 | -.04 | .05 | .01 | -.03 | -.01 | .07 | .04 | .05 | -.11 | -.05 |

*Note.* N = 598; EXC – Excitable; SKE – Skeptical; CAU – Cautious; RES – Reserved; LEI – Leisurely; BOL – Bold; MIS – Mischievous; COL – Colorful; IMA – Imaginative; DIL – Diligent; DUT – Dutiful; Correlations ≥ .08 are significant at $\rho <$ .08 (two-tailed).

### 3.2.3 Results of Scale to Scale Correlates

*Excitable.* The Excitable scale predicts behaviors ranging from calmness to explosiveness. Excitable people tend to become enthusiastic about new relationships or projects, perhaps even to idealize them, then to discover flaws or shortcomings in the idealized object and become disillusioned, discouraged, and upset. Consequently, the person will tend to reject that which he or she formerly idealized; such persons have many terminal quarrels with former friends and a history of repeated job turnover.

The behavior resembles Ainsworth, Blehar, Waters, and Wall's (1978) description of a child who is ambivalently attached to its primary caretakers--an eager approach to the caretaker followed by an angry rejection and turning away. Also, it resembles what the early theorists (Lewin, 1935) described as an approach-avoidance conflict--an oscillation between approaching and fleeing a goal object. We can speculate that, as children, these people experienced rejection from family members or peers. This rejection left them with an unfilled need for belonging and acceptance and a tendency to reach out for it; at the same time, they expect to be rejected and are unusually alert to signs of rejection. They have sufficient social skills to begin relationships, but their expectation of rejection robs them of the flexibility needed to sustain the relationships.

These people have never been able to evaluate their belief that rejection is inevitable; like moths they continue to return to the flame--they initiate interactions that they expect will fail, and the expectation turns into a self-fulfilling prophecy. As a result, high scores on the Excitable scale implicate more overt unhappiness than high scores on the other scales--because they continually repeat a self-defeating cycle of rejection and disappointment. Negative behaviors associated with elevated scores include overreaction to difficult situations, unpredictability, annoyance with others, inconsistency, tenseness, and negative affectivity.

Tables 3.1 through 3.5 contain correlations between the Excitable scale and other major personality assessments. Table 3.1 indicates that, of all the HDS scales, the Excitable scale has the largest negative correlation (-.71) with the Adjustment scale of the HPI. The HPI Adjustment scale is a good proxy for the FFM Emotional

Stability dimension (R. Hogan & Hogan, 2007, p. 55). As seen in this table, the HPI Adjustment scale is significantly related to all five HDS scales that compose the first factor of the HDS. Table 3.2 indicates that the Excitable scale is correlated with the CPI scales of Good Impression, Well-Being, and Self-Control, all with correlations greater than -.50. This suggests that high scorers on Excitable appear irritable and rebellious on the CPI. Table 3.3 presents correlations between the Excitable scale and the NEO PI-R Neuroticism scale. The relation between Excitable and NEO Neuroticism (r = .56) corroborates the view that Excitable is a proxy for FFM Emotional Stability. In fact, all facets correlate significantly with the Excitable scale, with one (depression) evidencing a stronger relationship (r=.57) than the Neuroticism scale as a whole. In addition, note that Excitable is primarily correlated with NEO Neuroticism and the other NEO scales are more modestly related or unrelated. Table 3.4 shows nearly identical results for the IPIP scales and Excitable as those seen with the NEO in Table 3.3. Both the pattern of FFM correlates and their magnitude are similar. Table 3.5 presents correlations between the Excitable scale and the 16 PF scales; Excitable should have its highest correlation with 16PF Emotional Stability and this is the case (r = -.56). Although the 16PF is not structured in terms of the FFM, inspection of the correlations indicate good convergent and discriminant validity for the Excitable scale.

Tables 3.6 through 3.8 contain correlations between the Excitable scale and selected motives and interest inventories. Table 3.6 indicates that the Excitable scale is significantly related to the MVPI Recognition and Hedonism scales with correlations of .30 and .23, respectively. This suggests that high Excitable individuals are motivated by attention–seeking and sensation-seeking behavior. Their volatile outbursts and explosiveness are, no doubt, related to their desire to demonstrate their involvement and energy. Table 3.7 shows correlations between the Excitable scale and the CISS interest and skill scales. No relations appear. Table 3.8 presents correlations between the Excitable scale and the JPI-R scales, which are rooted in Murray's (1938) needs. As with the personality scales, the highest Excitable correlation is with the Anxiety scale (r = .46), part of the Emotional Cluster; however, the scales of the Extraverted Cluster all produced negative correlations which are unexpected given the emotional energy of high Excitable individuals.

Tables 3.9 and 3.10 contain correlations between the Excitable scale and two cognitive measures. Generally, cognitive ability is unrelated to scores on Excitable. For the HBRI in Table 3.9, the relations are significant but not particularly meaningful due to the large sample size. Table 3.10 shows that this scale is uncorrelated with the Watson-Glaser Critical Thinking Appraisal scale, which is often used for managerial assessments (Watson & Glaser, 1980).

*Skeptical.* The Skeptical scale predicts behaviors ranging from expressing optimism to being critical, fault finding, and mistrustful. Skeptical people believe that the world is a dangerous place, full of people who will trick and deceive them, steal from them, or otherwise harm them in some way. As a result, they are wary, suspicious, and alert for signs of betrayal in their friends, family, coworkers, and employers. When they think they detect mistreatment, they retaliate directly. This may involve physical violence, accusations, or litigation--actions announcing that they are prepared to defend themselves. At their best, they are perceived as bright, they are able to detect patterns in the behavior of others that are logical, plausible, and often real, and they can defend their views about the intentions of others with remarkable skill and conviction. At their worst, their stubbornness and inability to compromise or trust others erodes their ability to build a team.

A prototype of the Skeptical person might have been James Jesus Angleton, the brilliant and refined head of the Central Intelligence Agency (CIA) counter-espionage unit during the 1970's. Angleton became persuaded that a Russian double agent had infiltrated the CIA; in his relentless efforts to find the potential spy, he badly demoralized the agency. Angleton was finally fired in apparent disgrace for these disruptions; nonetheless, the subsequent Aldrich Ames case suggests that he may have been right about the existence of a double agent working inside the CIA.

Skeptical people believe they were deceived at some point in their development. In order to protect themselves from future betrayal, they have become alert and watchful. Their alertness pays off because there are in fact people who will try to take advantage of them. The problem is that they also alienate potential friends and allies whom they incorrectly suspect of being their enemies.

Skeptical tendencies are notoriously difficult to capture in assessment procedures because these people tend to be suspicious, smart, and alert. Although the items on the Skeptical scale largely reflect suspiciousness and mistrust, the scale loads on the same factor as the Excitable scale. Tables 3.1 through 3.5 show correlations between the Skeptical scale and other measures of normal personality. Table 3.1 indicates that Skeptical is most highly correlated with the HPI Adjustment scale at r = -.53. Skeptical is negatively correlated with the other HPI scales except for the intellect/openness scales of Inquisitive and Learning Approach which, from a practical standpoint, are unrelated. Table 3.2 indicates that the highest Skeptical correlation with the CPI scales is for the Tolerance scale (r = -.50). This suggests that high scorers on Skeptical are intolerant, accusatory, divisive, and distrustful. Conversely, low scorers on Skeptical are seen as promoting the well-being of others, being fair-minded, and expressing goodwill. Table 3.3 shows that the Skeptical scale has its largest correlation with the NEO PI-R domain scale of Agreeableness (r = -.28) and its facets of Trust (r = -.33) and Compliance (r = -.33). This suggests that high scorers on Skeptical tend to be critical, antagonistic, and hard-hearted; low scorers on Skeptical tend to be sympathetic, eager to help, and forgiving. Table 3.4 shows that the Skeptical scale is correlated with IPIP Big 5 Emotional Stability (r = -.28), Extraversion (r = -.20), and Agreeableness (r = -.18) scales. The IPIP Agreeableness correlation corroborates the theme of intolerance and suspiciousness; however, the Extraversion relation also suggests that high scorers on Skeptical tend to be aloof, withdrawn, and pessimistic. Table 3.5 presents correlations between the Skeptical scale and the 16PF, where Skeptical has its highest correlation with 16PF Vigilance scale. The 16PF technical manual indicates that high range descriptors for the Vigilance factor are suspicious, skeptical, and wary whereas low range descriptors are trusting, unsuspecting, and accepting.

Tables 3.6 through 3.8 contain correlations between the Skeptical scale and selected motives and interest inventories. Table 3.6 indicates that the Skeptical scale has its highest correlations with the MVPI Recognition, Hedonism, and Power scales with r's = .45, .39, and .37, respectively. This suggests that high Skeptical individuals are motivated by needs for attention from others, for competition and challenge, and for self-expression and drama. Table 3.7 suggests no consistent relations between the Skeptical scale and self-reported assessments of interests or skills across seven occupational orientations. Only three modest relations appear in Table

3.8 between the Skeptical scale and the JPI-R scales, which include Tolerance (r = -.23), Risk Taking (r = .19), and Responsibility (r = -.19). These are consistent with the results presented in Tables 3.1 through 3.5. Similar to the other scales on the first factor of the HDS, there are no strong or consistent relations between the Skeptical scale and measures of cognitive ability (see Tables 3.9 and 3.10).

*Cautious.* The Cautious scale predicts behaviors ranging from a confident willingness to undertake new ventures to a conservative reluctance to try new things. Cautious people doubt their own abilities; at the same time, they are greatly concerned about making mistakes and being criticized for doing so. This creates a kind of rigidity born of insecurity in which a Cautious person is reluctant to do anything other than what has worked in the past–worked in the sense of allowing the person to avoid criticism. At work, such people will adhere to rules even when doing so is counterproductive. They will also resist innovation out of a concern for making errors. And their life style will be organized around efforts to avoid surprises and keep their affairs manageable and predictable. Their cautiousness extends to their staff, whom they fear will embarrass them, and whom they often discourage from taking any initiative. At their best, they are prudent and careful about evaluating risk; they rarely make rash or ill-advised moves and they provide sound advice about intended courses of action. At their worst, however, they avoid innovation, resist change, stall, and drag their feet, even when it is apparent that something needs to be done.

We can speculate that persons with high scores on the Cautious scale were raised by parents who were overprotective, controlling, and highly critical, and who never let their child explore, test his/her abilities, or manage his/her life. The syndrome associated with the Cautious scale resembles a failure at Erikson's second stage of psychosocial development or Freud's anal stage of development. The child, as a result, is guilt prone, rigid, conforming, and reluctant to learn new skills or to experiment. As a manager, these people will tend to micromanage their staff, resist innovation, and be reactive rather than proactive, in a defensive effort to avoid criticism. At the extreme, such people may continue to do their work in their customary way even when new procedures are clearly preferable and superior.

For the personality measures, Tables 3.1 through 3.5 present correlates for the Cautious scale. Table 3.1 indicates that Cautious is most highly correlated with HPI Ambition (r = -.68) followed by HPI Adjustment (r = -.45). The Cautious scale shows a negative manifold with all FFM-based scales as assessed by the HPI. Specifically, this pattern indicates that high scorers on Cautious are unassertive, awkward, inhibited, and withdrawn; generally, this pattern suggests that these individuals are unconcerned with ascendance and with getting along with others. Table 3.2 shows that Cautious is most highly correlated with CPI Dominance, Self-Acceptance, Sociability, and Independence scales, with r's = -.65, -.62, -.61, and -.61, respectively. This suggests that high scorers on Cautious are unassertive, shy, retiring, and submissive. Also, Cautious correlates .59 with CPI v. 1 scale Externality/Internality that assesses a continuum going from involvement to detachment. This relation suggests that high Cautious scores are associated with social introversion, fearfulness, and over-control of needs and impulses. Table 3.3 shows that the Cautious scale is most highly correlated with NEO PI-R Neuroticism (r = .52) and Extraversion (r = -.44) scales. Facet correlations were reviewed to illuminate the meaning of the scale

correlations and the two highest facet correlations are Self Consciousness (r = .62) and Assertiveness (r = -.59). Table 3.4 indicates that the Cautious scale correlates -.61 with IPIP Big 5 Extraversion and obtains much lower correlations with the other Big 5 scales. The 16PF correlations in Table 3.5 reiterate previous themes for interpreting high Cautious with Social Boldness (r = -.60), Apprehension (r = .53), and Dominance (r = -52).

Tables 3.6 through 3.8 contain correlations between the Cautious scale and selected motives and interest inventories. Table 3.6 shows that the Cautious scale has its highest correlations with MVPI Affiliation (r = -.31) and Security (r = .24) motives, suggesting that high scorers have little desire to meet new people or to network. However, they prefer risk-free environments and value financial security and safety. Table 3.7 indicates that high Cautious scorers are neither interested in influencing others through their leadership roles nor are they interested in adventurous or risky activities (see CISS Influencing and Adventuring scales). Table 3.8 indicates that the Cautious scale is correlated with the JPI-R Extroverted Cluster indicating that high scorers are socially uninvolved and inactive as opposed to having needs for socializing and interaction.

Tables 3.9 and 3.10 show that the Cautious scale is not meaningfully related to either the HBRI or the Watson-Glaser.

*Reserved.* The Reserved scale predicts behaviors ranging from caring about the problems of others to seeming indifferent to, or unconcerned about, other people. Reserved people are introverted, shy, misanthropic, and imperceptive or uninsightful about social, interpersonal, or political cues. Their imperceptiveness may be a function of deliberately ignoring other people; whatever the reason, they seem unconcerned about the welfare of others, indifferent to their moods and feelings, and unaware of or indifferent to how others react to them. They prefer to work alone, and are more interested in data and things than in people. They communicate poorly, if at all, they are unrewarding to deal with, and they have trouble building or maintaining a team. At their best, they are tough in the face of adversity; they are unfazed by criticism, reflection, and opprobrium. They can stay focused and not be distracted by emotional upheavals and stressful meetings. At their worst, however, they are insensitive to others' needs, moods, or feelings, and can be tactless, imperceptive, and gauche.

Such people can have successful careers in technical fields, but their indifference, stiffness, and insensitivity make them poor managers. The Chief Financial Officer of a hospital with which we have worked is a good example of this type. Each morning when he comes to work, he gets off the elevator, marches to his office without greeting anyone, goes into the office, shuts the door, hangs up his coat, and sits down at his desk. Only then will he respond to other people, and then only after they knock on his closed door. He is self-confident, bright, and very good with numbers, but his staff dislikes him because he communicates with them so infrequently and incompetently.

We suspect there is a genetic component to high scores on this scale--because shyness is known to be hereditary (cf. Jones, Cheek, & Briggs, 1991). A disposition toward shyness combined with parents who were withdrawn and uncommunicative would likely create a child who was withdrawn and awkward around peers. Feedback from peers might further exacerbate a child's tendency toward social withdrawal. There are, nonethe-

less, some real benefits to this pattern of interpersonal behavior. On the one hand, being genuinely indifferent to the problems of others can reduce the amount of stress in one's life. On the other hand, just as people seem compelled to try periodically to cheer up a depressed person, so people feel compelled to try to coax the high Reserved person out of his or her shell; this coaxing must to some degree reinforce the reserved behavior, giving it a manipulative quality.

Table 3.1 through 3.5 show correlations between the Reserved scale and other measures of normal personality. Table 3.1 indicates that high scorers on the Reserved scale are imperceptive and socially maladroit as seen with correlations for HPI Interpersonal Sensitivity (r = -.50) and HPI Ambition (r = -.38). Also, the correlation with HPI Sociability (r = -.29) suggests that they keep to themselves, prefer working alone, and dislike working in teams. Table 3.2 indicates that the highest Reserved correlation with the CPI is for the Sociability scale (r = -.43). This suggests that high scorers for Reserved prefer to avoid social participation; they are described by others as quiet, inhibited, and shy. Note that Reserved is unrelated to CPI Independence, Self-Control, and Good Impression. Table 3.3 shows that Reserved has its largest correlation with the NEO PI-R Extraversion (r = -.51), defined by the facets Warmth (r = -.55) and Gregariousness (r = -.50). These relations reiterate the interpretive themes that high Reserved scorers tend to be introverted. However, Costa and McCrae (1992, p. 15) take the position that introversion is the absence of extraversion, not its opposite. They suggest that "introverts are reserved rather than unfriendly, independent rather than followers, even-paced rather than sluggish. Introverts may say they are shy when they mean they prefer to be alone: they do not necessarily suffer from social anxiety." Nevertheless, the NEO facet correlations indicate an interpersonal style that is formal, cordial, and distant where the high Reserved person will actively avoid social stimulation. The correlates in Table 3.4 between the Reserved scale and the IPIP Big 5 scales corroborate the NEO results with the highest relations for IPIP Extraversion (r = -.54) and Agreeableness (r = -.48). Results presented in Table 3.5 for the 16PF highlight some of the nuanced relations seen with the other personality measures. Repeated with the 16PF are the Reserved themes of Warmth (r = -.46), Liveliness (r = -.44), Social-Boldness (r = -.42), Privateness (r = .44), and Self-Reliance (r = .46). Besides the obvious interpretations the 16PF factor labels imply, the subtle descriptors include formal, taciturn, threat-sensitive, non-disclosing, and solitary (Conn & Rieke, 1994, pp. 17-18).

Tables 3.6 through 3.8 contain correlations between the Reserved scale and selected motives and interest inventories. Table 3.6 indicates that the Reserved scale is correlated with the MVPI Affiliation (r = -.57) and Altruism (r = -.25) scales. This suggests that high Reserved individuals prefer to work alone and they value their private time. They prefer work environments where people attend to their own business and solve their own problems. They are unconcerned with social approval and they don't care to work in a team environment. In addition, they value productivity over staff morale and they tend to be disinterested in the problems and needs of others. Table 3.7 presents correlations between the Reserved scale and the self ratings of interest and skills from the CISS. The highest correlates in this table are for the CISS skills ratings for Producing (r = .30) and the interest ratings for Analyzing (r = .28). This interest pattern corroborates the values results obtained with the MVPI. Table 3.8 contains correlations between the Reserved scale and the JPI-R scales, indicating the highest relation with the Sociability (r = -.57) scale in the Extroverted Cluster. The negative correlation for Reserved and

the JPI-R Empathy (r = -.47) parallels the results with the MVPI Altruism scale, indicating a lack of interest in the needs of others.

Tables 3.9 and 3.10 indicate the Reserved scale is uncorrelated with either the HBRI or the Watson-Glaser.

*Leisurely*. The Leisurely scale predicts behaviors ranging from being cooperative, cheerful, and open to feedback to being stubborn, irritable, privately resentful, and difficult to coach. Such people are preoccupied with their own goals and dreams and they resent being disturbed or interrupted. Although requests for greater focus, productivity, or effort will irritate them, they won't express their irritation directly; rather, they will express it in relatively subtle ways. For example, they are often late for meetings, they procrastinate, and they put off working on tasks that don't interest them. They blame their non-performance on computer failures, lack of adequate resources, lack of cooperation from someone else, or other factors beyond their control. As managers they tend to set up their staff for failure by not telling them what they want, and then criticizing them for not delivering what they allege they actually wanted. Their prickly sensitivity, subtle uncooperativeness, and stubbornness make them unrewarding colleagues with whom to deal. At their best, they have good interpersonal skills; at their worst, they are peevish and stubborn, they focus independently on their own agenda, and they refuse to support their colleagues and subordinates.

We can only speculate about the origins of Leisurely behavior. The pattern may appear in children who were talented or attractive, and who were indulged but somewhat neglected. This combination left them feeling both special and resentful. Overtly and superficially compliant, they became privately rebellious and vindictive and they expect to be mistreated and unappreciated.

Tables 3.1 through 3.5 contain correlations between the Leisurely scale and other major personality assessments. Note that across all these tables, the Leisurely scale, which loads on the first factor on the HDS, has few strong markers from other personality scales. There are significant and consistent correlates with Emotional Stability construct measures, but other FFM measures are only modestly related or unrelated to the Leisurely scale. Table 3.1 indicates that the highest Leisurely correlation is with the HPI Adjustment (r = -.35), which in conjunction with low negative correlations with Ambition, Interpersonal Sensitivity, and Prudence, suggests a theme on the HPI of mild alienation. The correlations in Table 3.2 with the CPI are more helpful and suggest a syndrome of feeling victimized (CPI Well-Being), taking extra punitive action (CPI Tolerance), and being ruminative (CPI Sociability). Table 3.3 presents correlations between the Leisurely scale and the NEO PI-R Extraversion scale (r = -.25). A review of the facets for this scale suggests that Leisurely is most likely to concern a preference to be alone and not to seek the company of other people. This theme is replicated with the Leisurely correlation with IPIP Extraversion (r = -.29), as seen in Table 3.4. Table 3.5 provides insightful interpretive content for the Leisurely scale from four 16PF primary factors. Correlations between Leisurely and Self-Reliance (r = .42) and Privateness (r = .31) suggest that higher Leisurely scores are solitary, individualistic, and prefer their own decisions while also being private, discreet, and nondisclosing. Correlations for 16PF Abstractedness (r = .29) and Emotional Stability (r = -.28) indicate that these individuals tend to be imaginative and absorbed in ideas while, although not overtly displayed, being reactive and easily upset.

Tables 3.6 through 3.8 contain correlations between the Leisurely scale and selected motives and interest inventories. Table 3.6 indicates that the Leisurely scale is correlated with the MVPI Recognition (r = .35) and Hedonism (r = .33) scales. The MVPI Recognition results suggest that high Leisurely individuals value being visible for their independent thinking, their self-reliance, and their contribution of ideas, even if shared infrequently. The Hedonism results infer self-indulgence associated with independent, private, and uncommunicative behavior. Such people enjoy withholding information from others while denying that they create any problems in doing so. Table 3.7 shows that the Leisurely scale is uncorrelated with any self-report skill and interest scales on the CISS. Table 3.8 contains correlations between the Leisurely scale and the JPI-R scales, showing the highest relation with the Sociability (r = -.29) scale in the Extroverted cluster, indicating a lack of interest in interaction with others.

Tables 3.9 and 3.10 indicate the Leisurely scale has no practical relations with either the HBRI or the Watson-Glaser, although correlations with the HBRI are statistically significant due to the large sample size.

*Bold.* The Bold scale predicts behaviors ranging from modesty and self-restraint to assertive self-promotion and unrealistic expectations of success and power. Bold people are characterized by their feelings of grandiosity and entitlement; by virtue of a person's unique talents and attributes, he/she naturally deserves favors, praise, and recognition. They avoid recognizing their failures and shortcomings by means of narcissistic withdrawal-they won't associate with or listen to people who might criticize them--they take more credit for success than is fair, they blame their failures on others, and consequently they don't learn from experience. Bold people are often talented and capable, and their self-confidence encourages them to take initiative, offer opinions, and claim major competencies--e.g., "I can get this country moving again." As a result, they often rise rapidly in organizations, but others will find them hard to work with because they can be overbearing, demanding, feedback resistant, and unrealistic. Their inability to build a team and learn from experience usually leads to a fall from power. At their best, these people are energetic, charismatic, leader-like, and willing to take initiative to get projects moving. They are fearless about taking on any task and some elevation on this characteristic is needed for success in management, sales, and entrepreneurship. At their worst, they are arrogant, demanding, self-deceived, and pompous.

An example of a high functioning bold personality could be the brilliant and imperious Douglas MacArthur, who graduated first in his class from West Point and did well as an officer in World War I. Although he languished in the 1920's and 1930's, MacArthur led a brilliant defense and subsequent campaign against the Japanese in the Philippines in World War II, for which he became justifiably famous. He was fired by President Truman ten years later for impetuous insubordination during the Korean conflict. Talented, self-dramatizing, vain, overbearing, and self-aggrandizing, General MacArthur embodied the strengths and shortcomings of the bold personality at his best.

We can speculate that, as children, bold individuals were indulged, praised, and pampered (MacArthur certainly was), but not required to exercise much self-control. Indulgence without controls is actually a form of rejection which leaves a child with the feeling of being both very special and unworthy. The result is public self-confidence and self-assurance and private self-doubt.

Tables 3.1 through 3.5 show correlations between the Bold scale and other measures of normal personality. Table 3.1 indicates that Bold is most highly correlated with the HPI Sociability scale at r = .32. Bold is also correlated with the two HPI Intellect/Openness to Experience scales of Inquisitive (r = .23) and Learning Approach (r = .15). This pattern of positive scale relations suggests that high Bold scorers are outgoing, gregarious, entertaining, and dynamic. In addition, they are adventurous, idea generating, and motivated to improve their skills. Table 3.2 shows that the Bold scale is most highly correlated with CPI v.1 scale Externality/Internality (r = -.47) as well as the Dominance (r = .45) and the Self-Acceptance (r = .35) scales. Note that this pattern is almost identically inverse of the CPI scale correlates with the HDS Cautious scale. The Bold correlates with the v.1 scale can be interpreted with descriptors such as extraversion, talkative, outgoing, and self-confident as well as assertive, aggressive, and egotistical. These themes are repeated with correlations for CPI Dominance indicating tendencies to direct and control other people, influence them, and intimidate them. From the CPI Self-Acceptance scale the themes of feelings of personal worth, confidence with others, and accomplishment emerge for high Bold scorers. Table 3.3 shows that the Bold scale has its highest correlation with the NEO PI-R domain scale Extraversion (r = .30) and the facet within that domain that appears to be most influential is Assertiveness (r = .34). The interpretation of the Bold scale is extended by it's correlation with NEO facet scale Achievement Striving (r = .40), indicating that high Bold scorers have high aspirations and have a sense of purpose and career direction. This is in contrast with high Mischievous scorers discussed in the next section. Table 3.4 repeats these themes with correlations between the Bold scale and the IPIP Big-5 Extraversion (r = .30) and Intellect (r = .36) scales. The 16PF correlations in Table 3.5 indicate that the Bold scale is most highly related to the 16PF Dominance scale at r = .39. This indicates that high Bold scorers tend to be forceful, assertive, aggressive, competitive, and bossy.

Tables 3.6 though 3.8 contain correlations between the Bold scale and selected motives and interest inventories. Table 3.6 indicates that the Bold scale has its highest correlates with MVPI Power, Recognition, and Commerce scales with r's = .59, .57, and .40, respectively. This suggests that high Bold individuals are motivated to achieve and get things done and they value environments where there are opportunities to get ahead. In addition they value being visible and having their accomplishments recognized. They are motivated by money and financial gain; they see income as an indicator of success and accomplishment. Table 3.7 indicates that high Bold scorers are the psychological opposite of Cautious individuals. They are interested in influencing others through their leadership roles and they are interested in adventurous and risky activities (see CISS Influencing and Adventuring scales). Table 3.8 indicates that the Bold scale is correlated with the JPI-R Extroverted Cluster scales of Social Confidence (r = .45) and Energy Level (r = .32). This is consistent with the other personality and motives results.

Tables 3.9 and 3.10 show that the Bold scale is not meaningfully related to either the HBRI or the Watson-Glaser, although the correlations with the HBRI are statistically significant due to the large sample size.

*Mischievous.* The Mischievous scale predicts characteristics ranging from quiet, unassuming, and responsible to impulsive, limit-testing, and risky. These have features that Lykken (1995) and Cleckley (1982) use to describe a person who is charming but deceitful, easily bored, risk-taking, and careless about rules and conventions. The Mischievous person resembles the Bold person in terms of social skill, impulsiveness, and an inability to learn from experience, but Mischievous individuals lack the energy level and career focus of Bold individuals. From the observer's perspective, that which is most distinctive about these people is that they are bright, witty, and engaging, which is why they are able to extract favors, promises, money, and resources form other people with relative ease. They see others as utilities to be exploited, and therefore have problems maintaining commitments, and are unconcerned about violating expectations. At their best, they are self-confident and have an air of daring that others often find attractive and even intriguing. At their worst, they are impulsive, reckless, faithless, exploitive, and manipulative. Their self-confidence and recklessness lead to many mistakes but they seem unwilling to learn from experience; as a result, they tend to be underachievers, relative to their talents and capabilities.

Persons characterized as Mischievous are naturally bright and socially skilled; they are raised by parents who are warm and permissive, who indulge them, set no limits, and who find their evasions and deceptions amusing--possibly because the parent(s) also tend to prevaricate and cut corners when it is advantageous. These young people are often exposed to deceitful models in childhood. Some children learn early on that they can often have their way by being cute and by lying when it is convenient and plausible to do so.

An example of a high Mischievous individual could be Kim Philby, a bright, charming, and unusually talented man, whose father, Sir John Philby was a famous adventurer, scholar, British spy--and possible double agent. After graduating from Cambridge, Philby's exceptional talent and interpersonal skill allowed him to rise rapidly in British intelligence in the 1930's. The novelist Graham Greene, who worked for Philby during World War II, described him as the most impressive person he ever knew. Nonetheless, Philby routinely seduced his friends' wives, and he became a Russian double agent and the greatest traitor in British history. He escaped to Russia just as he was finally detected, where he lived like royalty but was never trusted by the Russians, and where he finally died.

Tables 3.1 through 3.5 show correlations between the Mischievous scale and other measures of normal personality. Table 3.1 indicates that Mischievous is most highly correlated with the HPI Sociability scale at r = .47, followed by the HPI Prudence scale at r = -.39 and the HPI Inquisitive scale at r = .35. This suggests that persons with high scores on the Mischievous scale will seem outgoing and entertaining (Sociability), impulsive and easily bored (Prudence), and bright and imaginative (Inquisitive). Table 3.2 indicates that the highest Mischievous correlations with the CPI scales are for the v.1 Externality/Internality (r = -.40), Self-Acceptance (r=.37), and Dominance (r = .30) scales. These relations suggest that high Mischievous scorers are socially assertive,

self-dramatizing, and boastful. In addition, they are unusually self-confident, they report being capable of meeting any situation, and they admit to being free of worries and problems. Table 3.3 shows that the Mischievous scale is most highly correlated with the NEO PI-R Excitement-Seeking (r = .35) facet on the Extraversion scale. The most interesting NEO relations are the facets that are uncorrelated with Mischievous which include Depression (r = -.03), Warmth (r = .07), Positive Emotions (r = .05), Feelings (r = .06), Tender-Mindedness (r = -.09), and Dutifulness (r = -.04). Table 3.4 indicates that the Mischievous scale correlates only modestly with the IPIP Extraversion and Intellect scales with r's = .18 and .19, respectively. Again, the suggested themes are sociability and seeming bright. Table 3.5 presents correlations between the Mischievous scale and the 16PF, where Mischievous has its highest correlation with the 16PF Dominance scale at r = .36. High Mischievous scorers could be described using terms similar to those for high Bold scorers—assertive and aggressive, but not deferential and not obedient.

Tables 3.6 through 3.8 contain correlations between the Mischievous scale and selected motives and interest inventories. Table 3.6 indicates that the Mischievous scale has its highest correlations with MVPI Power (r = .43), Recognition (r = .42), and Hedonism (r = .42) scales. This is the same pattern of relations as seen between Bold and the MVPI with a slightly different emphasis. MVPI Hedonism covaries to a greater extent with Mischievous than it does with the Bold scale and MVPI Power and Recognition covary to a lesser extent. These relations support the motivational shift that differentiates high scorers on Mischievous from high scorers on Bold, where the former have less of a career focus than the latter. For the Mischievous scale, Table 3.7 also tracks the same interest and skill shifts from the Bold scale. Note that the CISS Influencing and Skill ratings are significant but in reverse rank order than those for the Bold scale. Table 3.8 shows correlations between the Mischievous scale and the JPI-R scales. Meaningful relations concern needs to satisfy Risk Taking (r = .44), Social Confidence (r = .33), and Social Astuteness (r = .30) as assessed by the JPI-R.

Table 3.9 shows that the Mischievous scale is not meaningfully related to the scales of the HBRI. However, the correlation between Mischievous and the Watson-Glaser Evaluation of Arguments scale is significant suggesting some non-trivial relation between verbal ability and mischievous behavior.

*Colorful.* The Colorful scale predicts behaviors ranging from modesty and quiet self-restraint to dramatic and attention demanding self-expression. People with high scores on the Colorful scale need frequent and varied social contact, preferably while being at the center of attention. They develop considerable skill at making dramatic entrances and exits and otherwise cleverly calling attention to themselves. Interpersonally, they are gregarious, flirtatious, and often charming, but their interest in others tends to be superficial and primarily oriented toward gaining immediate agreement on how attractive they themselves are.

Because they have charm, wit, social presence, and the ability quickly to establish relationships with others, they tend to do well in sales jobs. But as managers their need for attention, inability to share credit, flightiness, lack of intellectual discipline, and lack of concentration tend to annoy and disorient their subordinates. At their best, they are bright, entertaining, flirtatious, and the life of the party. At their worst, they won't listen or plan,

they self-nominate and over commit themselves. Although they are entertaining, they are also easily distracted, impulsive, hyperactive, and unproductive.

A high functioning example of this interpersonal style could be the 42nd US President Bill Clinton. Clinton reports that his mother taught him that, after entering a room full of strangers, he should leave with everyone in the room liking him, a rule he still follows assiduously. He is an astonishingly good campaigner because he seems unable to get enough human contact and this makes him inexhaustible; his demand for attention nearly derailed his wife's presidential bid. His chaotic managerial style is legendary--but it hardly separates him from many politicians--as is his phenomenal ability to "connect" with strangers and to convey the sense that he "feels their pain." His conversations turn into speeches, and his inability to stay focused on a single topic and analyze it in depth also is well known. Finally, once again, he exemplifies the charm and attractiveness of this style, as well as its shortcomings in a managerial role.

Tables 3.1 through 3.5 contain correlations between the Colorful scale and other major personality assessments. Table 3.1 indicates that the Colorful scale is most highly correlated with the HPI Sociability scale (r = .61), which is the third highest correlation in the entire table. On the one hand, high scoring Colorful people are gregarious, entertaining, and dynamic. On the other hand, they also have difficulty listening, they interrupt others, and they are impulsive decision makers. Table 3.2 shows the Colorful scale is most highly correlated with the CPI v.1 scale Externality/Internality at r = -.63. Observers' descriptions of negatively related correlations with the v.1 scale include such items as unusually self-confident, has effective interpersonal techniques, witty and animated, and enjoys being interviewed. These same themes appear in the correlations with the CPI folk concept scale reflecting poise, self-assurance, and interpersonal proclivities. Correlating with the Colorful scale are five CPI scales including Dominance, Capacity for Status, Sociability, Social Presence, and Self-Acceptance, all with r's ≥ .40. Table 3.3 presents correlations between the Colorful scale and the NEO PI-R Extraversion scale and the facet scales of Extraversion. As seen, all relations are significant and positive ranging from r = .28 for the Excitement-Seeking facet to r = .55 for the Extraversion domain scale. Costa and McCrae (1992, p. 15) characterize these people as preferring large groups and gatherings, active, cheerful, and excitement and stimulation seeking. Table 3.4 shows correlations between the Colorful scale and the IPIP Big 5 scales indicating nearly identical results in terms of magnitude and direction for the IPIP Extraversion scale (r = .62). These results are amplified further with the results in Table 3.5 which show that the Colorful scale is correlated with the 16PF Social-Boldness (r = .61) scale. This extends the extraversion interpretation slightly to include venturesome, uninhibited, and thick-skinned.

Tables 3.6 through 3.8 contain correlations between the Colorful scale and selected motives and interest inventories. Table 3.6 indicates that the Colorful scale has it's highest correlation with the MVPI Recognition (r = .51) scale and is uncorrelated with the Tradition (r = .02) scale. Individuals with high Colorful scores value visibility and publicity, and they are interested in being recognized, visible, and famous. They seek work assignments that provide opportunities to be noticed and they want to lead others where there are opportunities for visibility. Table 3.7 indicates that high Colorful scorers are most interested in activities that involve

CISS Influencing (r = .28) and Creating (r = .23). Conversely, they appear to be indifferent to activities involving Organizing (r = -.01). Table 3.8 indicates that the Colorful scale is correlated with the JPI-R Extroverted Cluster scales, with the highest correlation for Social Confidence (r = .63). This is consistent with the other personality and interest results.

Tables 3.9 and 3.10 indicate the Colorful scale is uncorrelated with either the HBRI or the Watson-Glaser.

*Imaginative.* The Imaginative scale predicts behaviors that range from being levelheaded, sensible, and practical to imaginative, unusual, and unpredictable. People with high scores on the Imaginative scale tend to talk, dress, and behave in ways that are different and even unusual, but these actions typically are not self-conscious, affected, or necessarily designed to attract attention. These people are often bright and/or well educated, and they are often strikingly original in their ideas and insights. They take pride in being different and experimental. Other times, however, their ideas may be inappropriate or even disruptive. They communicate poorly, and as managers, they often leave people confused regarding their directions or intentions. Related to their imaginative and unusual insights is a kind of childish self-absorption; when they are involved in their work, they can be--at their worst--single-minded, insensitive to the needs and reactions of others, and unconcerned with the social or political fall-out that results from their intense focus. At their best, however, they can be amazingly insightful about the motives of others.

The same generalization is true for highly creative people. Their originality and insight is the source of innovation and even progress in an organization, but they are often hard to live with. Sometimes they are whimsical and charming; sometimes they are selfish and self-absorbed. At all times, however, their speech, dress, and mannerisms tend to set them apart from their more conventional and less creative peers.

Tables 3.1 though 3.5 show correlations between the Imaginative scale and other measures of normal personality. Table 3.1 indicates that Imaginative is most highly correlated with the HPI scales for Sociability (r = .42), Prudence (r = -.38), and Inquisitive (r = .33). Note that this is nearly the same pattern of correlates that appears for the Mischievous scale. Like Mischievous individuals, high Imaginative scorers are outgoing and entertaining, open to change, innovation, and new initiatives, and creative and curious. Table 3.2 indicates that the highest correlations with the CPI are for the Socialization (r = -.44) and the Self-Control (r = -.40) scales. Note that the CPI Socialization scale began as a measure of delinquency, with the lowest scores describing violent offenders, multiple offenders, imprisoned drug users followed by lesser offenders, exhibitionists, recreational drug users, and shoplifters. Criterion occupational samples, whose average scores are at the top end of the Socialization scale, include bankers, entrepreneurs, physicians, and engineers. High CPI Socialization scorers are described as conscientious, organized, and dependable while low scorers are described as cynical, disorderly, impulsive, and reckless. The CPI Self-Control correlation with Imaginative reaffirms the interpretation that the Imaginative scale reflects a range of normative behavior, with high Imaginative scorers breaking rules and violating norms as well as exhibiting emotional and spirited behavior.

Gough (1996) conceptualized the CPI Responsibility, Socialization, and Self-Control scales as an assessment of the internalization of conventional societal norms. The Self-Control scale, in particular, captures an impulsive, uninhibited, and erotic character. Table 3.3 shows that the Imaginative scale is most highly correlated with the NEO PI-R Openness (r = .49) scale and all of its facets. As elements of the Openness domain, Costa and McCrae (1992, p. 15) include imagination, aesthetic, variety, intellectual curiosity, and independence of judgment. The highest NEO facet correlates with Imaginative are for Fantasy (r = .46), Aesthetics (r = .37) and Ideas (r = .37). Interestingly, Costa and McCrae (1992) caution against interpreting Openness as equivalent to intelligence, suggesting that the NEO Openness domain is only modestly related to educational attainment and tested intelligence. The same appears to be true for Imaginative scale scores. Table 3.4 indicates that the Imaginative scale correlates most highly with IPIP Big 5 Intellect (r = .45) scale and to a lesser extent with IPIP Extraversion (r = .20). This is consistent with the NEO PI-R results. Table 3.5 presents correlations between the 16PF and the Imaginative scale. As seen in this table, the two highest correlations are between Imaginative and the Abstractedness (r = .51) scale and the Openness to Change (r = .48) scale. Abstractedness characterizes people who are imaginative, idea-oriented, and impractical, while Openness to Change characterizes people who are experimenting, liberal, and free-thinking. The converse of these descriptions includes traditional, conservative, practical, and grounded.

Tables 3.6 through 3.8 contain correlations between the Imaginative scale and selected motives and interest inventories. Table 3.6 indicates that the Imaginative scale has its highest correlations with MVPI Recognition (r = .45), Aesthetic (r = .36), Hedonism (r = .36), and Power (r = .34) scales. High Imaginative scorers value opportunities for visibility and at work, they seek assignments that are high profile and where success will garner substantial attention (Recognition and Power). They value work environments that foster experimentation and creativity (Aesthetic) as well as those where coworkers have fun and like entertainment (Hedonism). Table 3.7 shows that the Imaginative scale is most closely associated with CISS self-reported skills, particularly Influencing (r = .28), Creating (r = .26), and Adventuring (r = .25). High Imaginative scorers tend to believe that their skill sets include such activities as taking charge and making things happen as a result of persuasion, public presentations, and debates (Influencing). They are also confident in their ability to develop new things—products and concepts (Creating). Their confidence can extend to physical skills, competition, and opportunities for excitement (Adventuring). Table 3.8 presents correlations between the Imaginative scale and scales of the JPI-R. The highest Imaginative correlations are for Innovation (r = .47) and Risk Taking (r = .41) needs. These characteristics are present in results throughout the other measures.

Tables 3.9 and 3.10 show that the Imaginative scale is not meaningfully related to cognitive ability measures.

*Diligent.* The Diligent scale predicts behaviors ranging from being relaxed, tolerant, and willing to delegate to being meticulous, picky, critical, and overly conscientious. People with high scores on the Diligent scale are hard working, well-organized, careful, conservative, socially appropriate, fussy, and perfectionistic. Their meticulous attention to detail is useful and even important in many jobs, but it has a down side, too. Such people have trouble prioritizing their work because they believe that every task must be done equally well–which be-

comes increasingly difficult as a person becomes busier. They have trouble delegating--because they want to be sure that things are done right--which deprives their subordinates of opportunities to learn. They tend to micro-manage their staff, and their conservatism may make them resistant to change. They will be good with details, but they will rarely be a source of true innovation. At their best, these people are good role models who uphold the highest standards of professionalism in performance and comportment; they are typically popular with their bosses because they are so reliable. At their worst, however, they are fussy, particular, nit-picking micro-managers who deprive their subordinates of any choice or control over their work. The micro-management alienates their staff who soon refuse to take any initiative and simply wait to be told what to do and how to do it.

Such people resemble Freud's anal retentive personality type--stingy, neat, and stubborn. Freud suggested this behavior is caused by being severely toilet trained as a child; Erikson related the behavior to over-zealous parenting in which care-takers monitor a child's behavior too closely and the child develops too much self-control. Alternatively, one could see this syndrome as reflecting a child who is trying very hard to please his or her over-controlling parents. Whatever the developmental dynamics, high scores on the Diligent scale reflect excessive conformity but, for the most part, little personal unhappiness.

Tables 3.1 through 3.5 show correlations between the Diligent scale and other measures of normal personality. Table 3.1 presents correlations between Diligent and the HPI scales which indicate the highest correlation is with HPI Prudence (r = .31). Other scale correlations are nonsignificant or too low to be meaningfully interpreted. However, the correlation between Diligent and HPI Prudence suggests that, on the one hand, diligent people are orderly, attentive to details, and procedurally driven; on the other hand, they are over-controlling, rigid, inflexible, and change resistant. Table 3.2 indicates that the most salient correlation between Diligent and the CPI scales is for CPI Flexibility (r = -.49). Considering the nonsignificant relationship between Diligent and CPI Socialization, the Diligent scale meaning suggests this characteristic is unconcerned with conformity and heavily concerned with rigidity. The themes expressed for interpreting the CPI Flexibility scale, which are quite possibly shared by the Diligent scale, include prejudice, intolerance, compulsivity, and punitive attitudes. Table 3.3 shows that the highest correlation between Diligent and the NEO PI-R scales is the Order (r = .47) facet of the Conscientious (r = .45) domain scale. This suggests that high Diligent scorers may range from being well-organized to fastidious and compulsive. Table 3.4 corroborates these results for the Diligent scale with other personality results using the more general measure of Conscientiousness from the IPIP Big 5. The table shows the highest Diligent correlation achieved across all inventory scales is with IPIP Conscientiousness at r = .61. Table 3.5 presents another clear pattern of results between Diligent and the 16PF Perfectionism (r = .55) scale. This correlation reinforces the view that high Diligent scorers are perfectionistic, organized, precise, and compulsive.

Tables 3.6 through 3.8 contain correlations between the Diligent scale and selected motives and interest inventories. Table 3.6 indicates that the Diligent scale has its highest correlates with the MVPI Security (r = .47) and Commerce (r = .32) scales. This suggests that diligent individuals are primarily motivated by a desire for

job security and a desire for money. Interestingly, they are indifferent to social interaction (Affiliation), artistic environments (Aesthetic) and fun and good times (Hedonism). Table 3.7 shows that the Diligent scale is most closely associated with both interest and skills on the CISS Organizing and Analyzing scales. On the one hand, high Diligent scorers are interested in activities that bring orderliness and planfulness to work (CISS Organizing interest; r = .21) and they are interested in a process orientation to problem solving (CISS Analyzing interest; r = .26). On the other hand, they consider their skills to be along the lines of being good with details and adept at solving practical problems (CISS Organizing skill; r = .26) and of being facile with quantitative data and scientific methods (CISS Analyzing skill; r = .20). Table 3.8 presents correlations between the Diligent scale and scales of the JPI-R. The only correlation of note in the table is that for JPI-R Organization (r = .47), indicating that high Diligent scorers are motivated by needs for orderly and systematic behavior, including planning, scheduling, and structure.

Table 3.9 suggests statistically significant relations between Diligent and the HBRI Tactical and Strategic reasoning scales, which are due to the large sample size. The negative correlations seen in Table 3.10 between Diligent and three Watson-Glaser scales indicate that high Diligent scorers are likely to be less verbally fluent than low Diligent scorers.

*Dutiful*. The Dutiful scale predicts behaviors ranging from being independent and willing to challenge people in authority to being conforming and reluctant to take independent action. Dutiful people are compliant, conforming, unctuous, and excessively eager to please. Because they are so agreeable, they rarely make enemies; because they seldom criticize or complain, and because they don't threaten anyone, they tend to rise in organizations. As managers, they will be tactful and considerate but, because they are so eager to please their bosses, they avoid standing up for their subordinates. These people are characterized by excessive timidity and conformity rather than anxiety and self-doubt. At their best, these people are polite, conforming, and eager to please. At their worst, they have problems making decisions, taking initiative, or taking stands; consequently, the units for which they are responsible tend to drift, their staff feels unsupported, and they have trouble maintaining a team.

Tables 3.1 through 3.5 show correlations between the Dutiful scale and other measures of normal personality. Table 3.1 presents correlations between Dutiful and the HPI scales which indicate that Dutiful is most closely associated with HPI Ambition (r = -.28). High Dutiful scorers will be seen as unassertive, indecisive, uninterested in advancement, and satisfied with their status. They fail to take initiative and will do what they are told to do, regardless of the consequences for others. Table 3.2 indicates that the Dutiful scale has its highest correlations with CPI Independence (r = -.49), Dominance (r = -.41) and Self-Acceptance (r = -.40) scales. Negative Dutiful correlations with the CPI Independence scale suggest four interpretive themes and these include lack of perseverance, lack of self assurance particularly under pressure, willingness to comply without question, and abdication of decision making. The negative correlations between Dutiful and CPI Dominance and Self-Acceptance highlight these themes indicating a willingness to yield to more dominant people and a lack of confidence in dealing with others. Table 3.3 shows that the highest correlations between the Dutiful scale

and the NEO PI-R are for the Neuroticism facets Self-Consciousness (r = .37) and Vulnerability (r = .36) as well as the Extraversion facet Assertiveness (r = -.37). This pattern suggests that high Dutiful scorers are uncomfortable around others, dependent and unable to deal with difficult situations, and socially reticent, staying in the shadows. Table 3.4 contains correlations between the Dutiful scale and the IPIP Big 5 scales, where the highest Dutiful correlation in the table is for the IPIP Intellect (r = -.28) scale. Goldberg's (1999) Intellect scale concerns imagination, creativity, and interest in ideas which indicates that high Dutiful scorers are unimaginative and literal-minded, and they avoid abstraction and complexity. Interestingly, from the FFM marker test scales in Tables 3.1, 3.3, and 3.4, correlations between Dutiful and FFM measures of Emotional Stability are only modest, at best. This suggests that high Dutiful is more accurately interpreted along the lines of lacking assertiveness rather than being ridden with anxiety, negative affect, and worry. Table 3.5 presents correlations between the Dutiful scale and the 16PF scales. These results corroborate the relations obtained between Dutiful and the CPI scales. Note correlations for 16PF Dominance (r = -.35), Social-Boldness (r = -.27), and Apprehension (r = .27) scales.

Tables 3.6 through 3.8 contain correlations between the Dutiful scale and selected motives and interest inventories. Table 3.6 indicates that the Dutiful scale has its highest correlation with the MVPI Security (r = .32) scale. This suggests that Dutiful individuals are primarily motivated by good job security. They are interested in safety, predictable environments, and situations where chances of success are certain. They value stability, financial security, and clarity. Table 3.7 is notable for its lack of significant relations. Dutiful is relatively unrelated to any skill or interest scale from the CISS. The exception is the CISS Analyzing (r = -.23) scale, which can be interpreted as high Dutiful scorers are uncomfortable in autonomous work environments. Rather, they prefer to be guided, instructed, and directed about their actions. Table 3.8 presents correlations between the Dutiful scale and the JPI-R scales. Three scales are significantly correlated with and interpretable for understanding the Dutiful scale. The JPI-R Cooperativeness (r = .51) indicates a need for compliance, conformity, and a readiness to accept the desires of other group members. Correlations between Dutiful and JPI-R scales Innovation (r = -.34) and Social Confidence (r = -.35) imply interpretive themes of needs for tried-and-true methods for problem solving and for avoiding challenges to self-esteem.

Tables 3.9 and 3.10 show that the Dutiful scale is not meaningfully related to cognitive ability measures.

## 3.3 Correlations with Others' Descriptions

In this section, we present correlations between HDS scale scores and descriptions of a person's performance and/or characteristics rated by observers using standardized checklists. These analyses provide another method to evaluate the construct validity of the HDS scales. In addition, this is a rich source of information to guide practitioners' interpretations of the HDS scales. We provide correlation matrices for the HDS scales and four separate descriptive instruments, including adjectives, personality phrases, and work-oriented descriptive phrases. Note that these are all self-other relations with no self-self ratings reported in the analyses presented. Self-self correlations are available from Goldberg's (2008) Eugene-Springfield Community Sample.

### 3.3.1 Procedure

Separate studies evaluated the construct validity of the HDS scales. Data were collected as either part of archival research efforts or as part of personnel development applications. HDS data were gathered using online internet testing under unproctored conditions. HDS subjects who participated in archival research data collection were compensated for their participation; subjects who were assessed as part of a development program completed the inventories during their regular working hours. Observers who completed descriptions of the target were not compensated nor were they given any feedback. All HDS participants received feedback from their scored assessments. No data reported here were gathered as part of high stakes testing, where hiring, promotion, or other personnel decisions were considered.

### 3.3.2 Samples and Instruments

*Adjectival Descriptions and Personality Phrases.* Two sources of descriptive correlates are provided in data collected by Goldberg's longitudinal Eugene-Springfield Community Sample study. As a part of this study, respondents and observers (e.g., significant others, spouses, friends, acquaintances, coworkers) completed the Self/Peer Inventories, composed of 88 items taken from Saucier's (1994) 40-item Big-Five "Mini-Markers," and the 44-item Big-Five Inventory (John & Srivastava, 1999; Benet-Martinez & John, 1998) as well as two additional items in each inventory measuring physical attractiveness. In this survey, respondents described how well each adjective described either themselves or the target individual using a 5-point Likert scale ranging from 1 (Extremely Inaccurate) to 5 (Extremely Accurate). Big-Five Mini-Marker adjectival description results appear in Table 3.11 and results from the Big-Five Inventory personality phrases appear in Table 3.12.

Each participant, and up to four observers of each participant, completed these 88 items. The sample of 699 participants providing self ratings included 291 males and 395 females. Ages of subjects ranged from 18 years to 85 years with a mean of 51.21 years (SD = 12.72). Observers also responded to items assessing how and how well they knew the target, how much they liked the target, and basic demographic questions on gender and age. The sample of 1,756 respondents providing observer ratings included 655 males and 1,095 females (six observers did not provide gender data). Ages of observers ranged from 6 years to 94 years with a mean of 48.31 years (SD = 17.77). Observers were evenly split between spouses and other relatives (N = 883) compared with friends, coworkers, acquaintances, and significant others (N = 854), with 19 observers not indicating their relationship to the target. Most observers indicated knowing the target "well" or "very well" (N = 1740), and most indicated that they "liked" the target or liked the target "very much" (N = 1671).

For each of the 88 items, observer ratings were pooled into a composite by calculating a mean response across all observers. We used these mean responses (N=140) as the basis for calculating correlations between observer ratings and the HDS scales.

*Work-Oriented Descriptive Phrases.* Two sources of descriptive correlates are provided in data collected from individuals in supervisory jobs along with observers' ratings of their performance and/or characteristics. Correlations between managers' (N = 193) HDS scores and their coworkers ratings on a 150-item observer description questionnaire appear in Table 3.13. The questionnaire contained items frequently used by others to characterize managers' performance. Coworkers used a 5-point rating scale to indicate the frequency with which the manager exhibited the behavior listed. No demographic data were recorded for these participants.

Results from a second source of managers' HDS scale scores and observer ratings provided by spouses (N=54) and executive coaches (N=61) appear in Table 3.14. The observers used a 5-point rating scale to indicate the frequency with which the manager exhibited each of the 107 behavioral characteristics listed. No demographic data were recorded for these participants.

Table 3.11

HDS Correlations with Observer Ratings for Big-Five Mini-Marker Adjectives

| Adjective | EXC | SKE | CAU | RES | LEI | BOL | MIS | COL | IMA | DIL | DUT |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Bashful | .08 | .07 | .39 | .24 | .10 | -.24 | -.17 | -.34 | -.16 | .03 | .18 |
| Bold | -.16 | -.03 | -.40 | -.16 | -.01 | .16 | .13 | .32 | .20 | .07 | -.21 |
| Careless | .15 | .16 | -.14 | .07 | .00 | .13 | .23 | .26 | .15 | -.17 | -.09 |
| Cold | .22 | .17 | .02 | .18 | .00 | -.02 | .05 | -.01 | -.09 | .05 | -.20 |
| Complex | -.05 | -.03 | -.14 | .11 | .04 | .06 | .07 | -.09 | .08 | .06 | -.20 |
| Cooperative | -.31 | -.17 | .07 | -.11 | -.11 | -.05 | -.18 | -.14 | -.06 | .02 | .15 |
| Creative | -.11 | .10 | -.19 | -.14 | -.04 | .32 | .09 | .12 | .22 | .00 | -.20 |
| Deep | -.15 | -.15 | -.07 | .02 | .02 | .09 | .06 | -.12 | .07 | -.04 | -.14 |
| Disorganized | .13 | -.03 | .14 | .01 | -.08 | -.17 | .06 | .06 | .07 | -.36 | .12 |
| Efficient | -.19 | .00 | -.19 | -.17 | .05 | .23 | -.04 | .10 | -.05 | .31 | -.18 |
| Energetic | -.31 | -.11 | -.30 | -.17 | .03 | .15 | .22 | .30 | .07 | .06 | -.04 |
| Envious | .13 | .13 | -.16 | -.11 | -.10 | .04 | .12 | .10 | .00 | .01 | -.17 |
| Extraverted | -.16 | .05 | -.49 | -.32 | -.16 | .26 | .26 | .41 | .15 | .06 | -.12 |
| Fretful | .28 | .05 | .16 | -.10 | .09 | .02 | .08 | .03 | -.09 | -.01 | .12 |
| Good-looking | -.15 | -.17 | -.17 | -.16 | -.09 | -.02 | -.02 | .17 | -.14 | -.01 | .00 |
| Harsh | .29 | .21 | -.05 | -.01 | .04 | .12 | .10 | .08 | .11 | .05 | -.10 |
| Imaginative | -.18 | .02 | -.26 | -.15 | -.06 | .27 | .17 | .13 | .29 | -.02 | -.28 |
| Inefficient | .19 | -.01 | .07 | .01 | -.06 | -.20 | .11 | .03 | .06 | -.29 | .08 |
| Intellectual | -.09 | -.10 | .03 | .08 | .03 | .02 | -.06 | -.16 | -.06 | -.03 | -.08 |
| Jealous | .25 | .17 | -.16 | -.15 | .02 | .12 | .19 | .18 | .09 | .03 | -.14 |
| Kind | -.26 | -.32 | .02 | -.30 | .05 | -.02 | -.16 | .02 | -.09 | .04 | .25 |
| Moody | .37 | .14 | .12 | .03 | .05 | -.08 | .06 | -.03 | .07 | -.06 | -.09 |
| Organized | -.11 | .00 | -.12 | -.08 | .07 | .19 | -.11 | -.06 | -.13 | .36 | -.04 |
| Philosophical | -.14 | -.26 | -.09 | .04 | -.10 | .03 | -.03 | -.07 | .15 | -.11 | -.09 |
| Practical | -.27 | -.07 | -.03 | .04 | .08 | .01 | -.13 | -.10 | -.06 | .19 | .06 |
| Quiet | .06 | .03 | .39 | .37 | .19 | -.15 | -.12 | -.42 | -.10 | .09 | .14 |
| Relaxed | -.25 | -.05 | -.08 | .11 | -.03 | -.07 | -.04 | -.23 | .07 | -.11 | -.07 |
| Rude | .26 | .20 | -.14 | .09 | .02 | .07 | .05 | .09 | .03 | .01 | -.23 |
| Shy | .06 | -.02 | .41 | .29 | .08 | -.22 | -.08 | -.36 | -.11 | -.03 | .12 |
| Sloppy | .22 | -.03 | .11 | .10 | .01 | -.10 | .06 | .06 | .09 | -.31 | .01 |
| Sympathetic | -.10 | -.16 | .10 | -.32 | .00 | .02 | -.12 | -.01 | .00 | .08 | .19 |
| Systematic | -.09 | .00 | -.05 | .06 | .11 | .15 | -.07 | -.15 | -.10 | .34 | -.01 |
| Talkative | -.10 | -.05 | -.38 | -.44 | -.13 | .23 | .11 | .34 | .14 | .04 | -.10 |
| Temperamental | .30 | .16 | -.02 | -.06 | .04 | .03 | .11 | .04 | .11 | .03 | -.15 |
| Touchy | .18 | .01 | -.06 | -.13 | -.02 | -.01 | .02 | .06 | -.01 | .04 | -.02 |
| Unattractive | .14 | .15 | .13 | .21 | .07 | -.01 | .05 | -.15 | .08 | .05 | -.03 |
| Uncreative | .24 | -.08 | .23 | .08 | .04 | -.32 | -.07 | -.16 | -.18 | -.05 | .18 |
| Unenvious | -.14 | -.23 | .14 | .07 | .05 | -.05 | -.11 | -.12 | -.03 | -.02 | .08 |
| Unintellectual | .11 | .00 | .01 | -.08 | -.06 | -.05 | .03 | .14 | .02 | .05 | .11 |
| Unsympathetic | .21 | .19 | .04 | .26 | .01 | -.05 | .06 | -.03 | -.06 | .01 | -.17 |
| Warm | -.18 | -.17 | -.02 | -.35 | -.04 | .03 | .02 | .03 | .09 | .05 | .09 |
| Withdrawn | .25 | .10 | .33 | .30 | .11 | -.21 | -.11 | -.25 | -.14 | .04 | -.03 |

*Note.* N =140; EXC – Excitable; SKE – Skeptical; CAU – Cautious; RES – Reserved; LEI – Leisurely; BOL – Bold; MIS – Mischievous; COL – Colorful; IMA – Imaginative; DIL – Diligent; DUT – Dutiful; Correlations ≥ .17 are significant at $\rho < .05$ (two-tailed).

Table 3.12

HDS Correlations with Observer Ratings for Big-Five Inventory Phrases

| Phrase | EXC | SKE | CAU | RES | LEI | BOL | MIS | COL | IMA | DIL | DUT |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Finds faults with others | .20 | .09 | -.02 | -.02 | .03 | .04 | -.04 | .05 | -.05 | .01 | -.02 |
| Does a thorough job | -.16 | -.05 | -.06 | -.06 | -.02 | .11 | -.02 | -.04 | -.15 | .25 | -.01 |
| Is depressed/blue | .28 | .07 | .16 | .06 | -.05 | -.12 | -.06 | -.15 | .04 | -.07 | -.02 |
| Is reserved | .15 | .05 | .39 | .33 | .16 | -.17 | -.21 | -.33 | -.14 | -.01 | .16 |
| Can be somewhat careless | .19 | -.01 | .03 | -.01 | -.06 | -.03 | .16 | .22 | .14 | -.38 | .00 |
| Relaxed/handles stress well | -.33 | -.10 | -.18 | .13 | -.04 | -.05 | .06 | -.04 | .12 | -.05 | -.14 |
| Full of energy | -.34 | -.08 | -.37 | -.13 | -.03 | .16 | .21 | .28 | .16 | .05 | -.04 |
| Starts quarrels with others | .25 | .25 | -.01 | .01 | .05 | .06 | .04 | .01 | .05 | .07 | -.08 |
| Can be moody | .35 | .13 | .09 | .01 | .03 | -.09 | .05 | .00 | .01 | -.07 | -.08 |
| A reliable worker | -.24 | -.19 | -.05 | -.07 | .01 | .05 | -.04 | -.02 | -.18 | .11 | .12 |
| Can be tense | .23 | .06 | .02 | -.07 | -.02 | .09 | .07 | .12 | -.05 | .10 | .05 |
| Ingenious/deep thinker | -.13 | -.06 | -.14 | .17 | .10 | .14 | .02 | -.13 | .18 | .08 | -.23 |
| Generates a lot of enthusiasm | -.32 | -.19 | -.37 | -.42 | -.10 | .20 | .16 | .34 | .12 | .08 | -.04 |
| Has a forgiving nature | -.18 | -.33 | .11 | -.16 | -.06 | -.14 | -.11 | .00 | -.03 | -.17 | .20 |
| Physically attractive | -.14 | -.19 | -.15 | -.19 | -.12 | .02 | -.03 | .21 | -.13 | -.02 | .01 |
| Tends to be disorganized | .06 | .00 | .07 | .00 | -.09 | -.16 | .11 | .10 | .05 | -.34 | .08 |
| Worries a lot | .30 | .10 | .22 | -.17 | .05 | -.05 | .00 | -.01 | -.07 | -.05 | .18 |
| Has an active imagination | -.22 | -.13 | -.21 | -.18 | -.07 | .25 | .19 | .16 | .25 | -.07 | -.12 |
| Tends to be quiet | .10 | .01 | .44 | .39 | .15 | -.17 | -.11 | -.42 | -.11 | -.05 | .12 |
| Generally trusting | -.30 | -.23 | -.04 | -.08 | -.23 | -.07 | -.11 | -.08 | -.04 | -.04 | .09 |
| Tends to be lazy | .28 | .13 | .09 | .02 | .10 | -.03 | -.01 | -.07 | -.10 | -.15 | -.09 |
| Gets nervous easily | .29 | .01 | .26 | -.09 | .05 | -.04 | -.09 | .03 | -.11 | -.03 | .24 |
| Emotionally stable/not easily upset | -.27 | -.09 | -.01 | .08 | -.04 | -.09 | -.04 | -.11 | -.05 | .03 | .07 |
| Inventive | -.25 | -.04 | -.27 | -.01 | .02 | .26 | .15 | .11 | .28 | .08 | -.17 |
| Has an assertive personality | -.20 | .05 | -.50 | -.23 | -.07 | .25 | .16 | .33 | .18 | .16 | -.17 |
| Original/comes up with new ideas | -.21 | .01 | -.28 | -.20 | -.01 | .33 | .13 | .18 | .24 | .08 | -.11 |
| Can be cold and aloof | .26 | .11 | .07 | .27 | .15 | -.01 | .07 | .03 | -.04 | .10 | -.11 |
| Not good-looking | .07 | .09 | .18 | .18 | .05 | -.09 | -.03 | -.20 | .06 | .03 | -.02 |
| Perseveres until the task is finished | -.23 | -.10 | -.05 | -.02 | .03 | .07 | -.01 | -.04 | -.12 | .19 | .13 |
| Values artistic, aesthetic experiences | -.15 | -.23 | -.09 | -.20 | -.09 | .09 | .05 | .13 | .17 | -.09 | -.01 |
| Sometimes shy/inhibited | .13 | .00 | .51 | .30 | .14 | -.21 | -.11 | -.39 | -.15 | -.01 | .24 |
| Considerate and kind to almost everyone | -.27 | -.30 | .04 | -.19 | -.12 | -.10 | -.05 | -.06 | -.01 | -.05 | .22 |
| Does things efficiently | -.22 | -.03 | -.16 | -.11 | .01 | .22 | .01 | .08 | -.04 | .28 | -.08 |
| Remains calm in tense situations | -.27 | -.10 | -.12 | .10 | -.06 | -.06 | .01 | -.09 | -.01 | .04 | -.07 |
| Prefers routine work | .24 | .02 | .29 | .10 | .10 | -.23 | -.21 | -.25 | -.25 | .12 | .14 |
| Helpful & unselfish with others | -.24 | -.23 | .08 | -.14 | -.07 | -.11 | -.09 | -.10 | .00 | -.06 | .23 |
| Outgoing/sociable | -.23 | -.09 | -.43 | -.44 | -.19 | .23 | .13 | .37 | .14 | -.03 | -.02 |
| Sometimes rude to others | .21 | .12 | -.07 | .10 | .03 | .01 | .02 | .02 | .03 | -.03 | -.22 |
| Makes plans and follows through | -.28 | .03 | -.17 | -.14 | .09 | .25 | .01 | .08 | .00 | .24 | .01 |
| Likes to reflect/play with ideas | -.13 | .03 | -.11 | -.05 | .01 | .20 | .09 | .00 | .21 | .00 | -.15 |
| Has few artistic interests | .02 | .07 | .00 | .24 | .00 | -.13 | .03 | -.10 | -.21 | .01 | .04 |
| Likes to cooperate with others | -.19 | -.22 | .17 | -.14 | -.06 | -.04 | -.08 | -.01 | -.06 | -.09 | .28 |
| Easily distracted | .12 | -.06 | .02 | -.05 | -.05 | -.10 | -.05 | .13 | .10 | -.25 | .02 |
| Sophisticated in art, music, literature | -.09 | -.17 | -.04 | -.15 | .05 | .05 | -.07 | .07 | .14 | .00 | -.06 |
| Curious about many different things | -.26 | -.02 | -.11 | -.01 | .04 | .20 | .10 | .07 | .35 | -.04 | -.04 |

*Note*. N =140; EXC – Excitable; SKE – Skeptical; CAU – Cautious; RES – Reserved; LEI – Leisurely; BOL – Bold; MIS - Mischievous; COL – Colorful; IMA – Imaginative; DIL – Diligent; DUT – Dutiful; Correlations ≥ .17 are significant at $\rho < .05$ (two-tailed).

Table 3.13

HDS Correlations with Co-Worker Description Ratings

| HDS Scale<br>Observer's Description Item | r | HDS Scale<br>Observer's Description Item | r |
|---|---|---|---|
| **Excitable** | | **Mischievous** | |
| Yells at people when they make mistakes | .30 | Is deceitful | .17 |
| Expresses emotions appropriately | -.30 | Is arrogant | .17 |
| Is easily upset | .29 | Is a follower | -.16 |
| Follows company policy | -.29 | Is unassuming | -.16 |
| Is self-doubting | .28 | Acts in a socially appropriate manner | .16 |
| Is fault finding | .27 | Is independent | .16 |
| Is tense | .27 | Is flighty | .15 |
| Is calm | -.27 | Tests the limits | .14 |
| Is moody | .26 | | |
| Is predictable | -.24 | **Colorful** | |
| Accepts feedback well | -.22 | Tests the limits | .27 |
| Is quick to become angry | .21 | Is self-restrained | -.24 |
| | | Is quiet | -.24 |
| **Skeptical** | | Questions people's loyalty | -.24 |
| Is not easily disappointed | -.28 | Is innovative | .23 |
| Needs attention | .28 | Is a follower | -.21 |
| Feels mistreated | .26 | Is a smooth talker | .21 |
| Is easily hurt by criticism | .25 | Is quick to become angry | .20 |
| Is tense | .24 | Is socially insightful | .19 |
| Is easily upset | .23 | Is the "life of the office" | .17 |
| Is fault finding | .21 | Is detail-oriented | -.17 |
| Is unassuming | -.21 | Is reserved | -.16 |
| Is uninterested in close relationships | -.20 | | |
| Questions people's loyalty | .19 | **Imaginative** | |
| | | Engages in horseplay | .22 |
| **Cautious** | | Is self-restrained | -.20 |
| Is self-doubting | .28 | Is socially insightful | .20 |
| Is rational | -.25 | Is predictable | -.18 |
| Is consistent | .20 | Is the "life of the office" | .18 |
| Expresses emotions appropriately | -.20 | Is imaginative | .17 |
| Enjoys meeting new people | -.19 | Has odd attitudes | .17 |
| Feels inadequate | .18 | Is eccentric | .16 |
| Is content with self-image | -.17 | Is calm | -.16 |
| Is anxious | .17 | Is flighty | .15 |
| Is uneasy around new people | .17 | Is innovative | .15 |

Table 3.13 cont.

HDS Correlations with Co-Worker Description Ratings

| HDS Scale<br>Observer's Description Item | r | HDS Scale<br>Observer's Description Item | r |
|---|---|---|---|
| **Reserved** | | **Diligent** | |
| Enjoys meeting new people | -.21 | Is detail-oriented | .22 |
| Is self-centered | .19 | Is polite | .20 |
| Is kind | -.18 | Is uninterested in close relationships | -.17 |
| Needs reassurance | -.18 | Is perfectionistic | .15 |
| Is socially inept | .17 | Is organized | .15 |
| Is considerate | -.15 | | |
| Does not follow company policy | -.15 | | |
| Is accommodating | -.15 | | |
| **Leisurely** | | **Dutiful** | |
| Enjoys meeting new people | -.19 | Is predictable | .15 |
| Delegates tasks appropriately | .19 | Is a follower | .15 |
| Tests the limits | -.17 | Is unassuming | .14 |
| Feels mistreated | .16 | Makes own decisions | -.13 |
| Is practical | -.16 | Is empathetic | .13 |
| Encourages constructive criticism | -.15 | Is indecisive | .13 |
| Questions people's loyalty | .15 | Is nonconforming | -.13 |
| Is resentful | .15 | Is self-restrained | .13 |
| | | Is rude | -.13 |
| **Bold** | | | |
| Is self-restrained | -.22 | | |
| Is a follower | -.20 | | |
| Is easy going | -.20 | | |
| Is content with self-image | .19 | | |
| Is self-promoting | .17 | | |
| Acts in a socially appropriate manner | .17 | | |
| Tests the limits | .17 | | |
| Holds grudges | -.17 | | |
| Sociable | .15 | | |

*Note.* N = 193; Correlations ≥ .13 are significant at $\rho < .05$ (two-tailed).

Table 3.14

HDS Correlations with Spouse and Coach Description Ratings

| HDS Scale<br>Description Item | Spouse<br>r | Coach<br>r | HDS Scale<br>Description Item | Spouse<br>r | Coach<br>r |
|---|---|---|---|---|---|
| **Excitable** | .40 | .44 | **Mischievous** | .30 | .67 |
| Is easily disappointed | .14 | .37 | Spontaneous | -.09 | .39 |
| Frustrated with others | .29 | .30 | Does not follow through | .16 | .21 |
| Impatient and irritable | .22 | .30 | Bends the rules | .30 | .41 |
| Moody and negative | .29 | .45 | Seeks entertainment | .12 | .71 |
| Hard to please | .18 | .12 | Enjoys being in the 'fast lane' | .29 | .68 |
| Self-defeating | .46 | .30 | Has no regrets | .06 | .14 |
| Overreacts | .39 | .30 | Wants quick results | -.00 | .46 |
| Volatile and unpredictable | .18 | .21 | Charming and fun-loving | .01 | .41 |
| Quick to anger | .32 | .23 | Smooth talker | .32 | .32 |
| **Skeptical** | .14 | .21 | **Colorful** | .50 | .38 |
| Analytical | .43 | -.00 | Craves recognition | .33 | .30 |
| Shrewd | -.16 | -.04 | Wants to be noticed | .26 | .24 |
| Oversensitive | .08 | -.05 | Entertaining | .26 | .35 |
| Argumentative | -.07 | .19 | Easily bored | .11 | .22 |
| Easily offended | .13 | .18 | Attracts attention | .38 | .32 |
| Skeptical | .02 | .21 | Emphasizes the big picture | -.06 | .02 |
| Has trouble trusting | .16 | .28 | Charming | .13 | -.05 |
| Feels mistreated | .33 | -.03 | Does several things at once | -.02 | .43 |
| Enjoys debating | .03 | .13 | Good public speaker | .26 | .24 |
| Vigilant and watchful | .10 | .26 | Life of the party | .40 | .52 |
| Overly critical | .05 | .19 | | | |
| Is self-centered | .16 | -.15 | | | |
| **Cautious** | .48 | .63 | **Imaginative** | .21 | .27 |
| Uneasy with strangers | .39 | .48 | Has an unusual appearance | .01 | .38 |
| Easily embarrassed | .45 | .50 | Creative | .18 | .14 |
| Cautious and worried | .32 | .47 | Socially insightful | -.13 | -.15 |
| Trouble making decisions | .20 | .53 | Imaginative | .12 | .13 |
| Pessimistic | .02 | .38 | Easy to approach | .16 | -.20 |
| Avoids taking risks | .39 | .27 | Enjoys having company | -.07 | .06 |
| Easily hurt by criticism | .33 | .39 | Has unusual ideas | .09 | .27 |
| Tense and fearful | .25 | .52 | Eccentric | -.00 | .37 |
| Misses opportunities | .20 | .39 | Approachable | -.03 | -.12 |
| Avoids taking responsibility | .20 | -.06 | Unconventional | .45 | .25 |
| Avoids taking the initiative | .28 | .22 | Gets distracted | .26 | .08 |

Table 3.14 cont.

HDS Correlations with Spouse and Coach Description Ratings

| HDS Scale<br>Description Item | Spouse<br>r | Coach<br>r | HDS Scale<br>Description Item | Spouse<br>r | Coach<br>r |
|---|---|---|---|---|---|
| **Reserved** | .43 | .33 | **Diligent** | .52 | .42 |
| Reserved and formal | .12 | .22 | Perfectionistic | .32 | .30 |
| Detached | .48 | .33 | Good with details | .40 | .30 |
| Cool and aloof | .21 | -.03 | Organized | .57 | .32 |
| Independent and tough | .06 | .12 | Disciplined and thorough | .22 | .30 |
| Withdrawn | .38 | .37 | Plans every detail | .48 | .22 |
| Tunes people out | .16 | .19 | Sets very high standards | .20 | .36 |
| Is comfortable alone | .38 | .28 | Overly conscientious | .35 | .42 |
| Has a thick skin | .02 | -.19 | Resistant to change | .11 | .15 |
| | | | Precise and accurate | .35 | .38 |
| **Leisurely** | .20 | .14 | | | |
| Feels others ask too much | .01 | .01 | **Dutiful** | .29 | .23 |
| Procrastinates | .25 | .27 | Soothing and comforting | .23 | .21 |
| Feels overburdened | .33 | .03 | Supportive and helpful | .23 | .02 |
| Holds grudges | .00 | .08 | Easy to please | .19 | -.05 |
| Does things his/her way | -.19 | .09 | Warm and congenial | .22 | .10 |
| Resists advice | .02 | -.15 | Needs others' support | .12 | .29 |
| Feels hurried and pressured | .28 | .09 | Forgiving and tolerant | -.01 | .25 |
| Criticizes authority | .13 | .04 | Defers to others' opinions | .19 | .10 |
| | | | Prefers working with others | .43 | .12 |
| **Bold** | .32 | .36 | Loyal follower | .11 | .30 |
| Very confident | .31 | .24 | Self-sacrificing | .14 | .18 |
| Arrogant | .22 | .36 | | | |
| Takes advantage of others | -- | .30 | | | |
| Has strong opinions | .07 | .29 | | | |
| Expects special consideration | .06 | .28 | | | |
| Self-promoting | .15 | .25 | | | |
| Very stress-tolerant | -.07 | -.01 | | | |
| Direct and assertive | .28 | .33 | | | |
| Intensely competitive | .26 | .11 | | | |

*Note*. Spouse N = 54; Coach N = 61; Spouse correlations ≥ .22 are significant at $\rho < .05$ (two-tailed); Coach correlations ≥ .21 are significant at $\rho < .05$ (two-tailed).

### 3.3.3 Results of Scale and Observer Description Correlates

*Excitable.* Table 3.11 contains correlations between Excitable scale scores and peer observer ratings for the Big-Five Mini-Marker adjectives. The five items with the largest positive correlations and the five with the largest negative correlations are reported below.

| | |
|---|---|
| Moody (.37) | Cooperative (-.31) |
| Temperamental (.30) | Energetic (-.31) |
| Harsh (.29) | Practical (-.27) |
| Fretful (.28) | Kind (-.26) |
| Rude (.26) | Relaxed (-.25) |

Table 3.12 lists correlations between Excitable scale scores and observer ratings for the Big-Five Inventory personality phrases. The five phrases with the largest positive correlations and the five with the largest negative correlations are reported below.

| | |
|---|---|
| Can be moody (.35) | Full of energy (-.34) |
| Worries a lot (.30) | Relaxed/handles stress well (-.33) |
| Gets nervous easily (.29) | Generally trusting (-.30) |
| Is depressed/blue (.28) | Makes plans and follows through (-.28) |
| Tends to be lazy (.28) | Emotionally stable/not easily upset (-.27) |

Table 3.13 presents correlations between Excitable scale scores and coworkers' description ratings of the target manager's performance. As seen in the table, the highest positive correlation is with the item "Yells at people when they make mistakes" (r = .30) and the highest negative correlation is with the item "Expresses emotions appropriately" (r = -.30). Two other notable relations include correlations with "Is easily upset" (r = .29) and "Accepts feedback well" (r = -.22).

Table 3.14 displays two sets of correlations between Excitable scale scores from a target manager and ratings of that manager provided by a spouse and ratings provided by a coach. In terms of magnitude and direction, the most significantly consistent ratings by spouse and coach, respectively, occurred for the items listed below:

Self-defeating (.46, .30)
Overreacts (.39, .30)
Quick to anger (.32, .23)
Moody and negative (.29, .45)
Frustrated with others (.29, .30)

*Skeptical.* Table 3.11 contains correlations between Skeptical scale scores and peer observer ratings for the Big-Five Mini-Marker adjectives. The five items with the largest positive correlations and the five with the largest negative correlations are reported below.

| | |
|---|---|
| Harsh (.21) | Kind (-.32) |
| Rude (.20) | Philosophical (-.26) |
| Unsympathetic (.19) | Unenvious (-.23) |
| Cold (.17) | Cooperative (-.17) |
| Jealous (.17) | Warm (-.17) |

Table 3.12 lists correlations between Skeptical scale scores and observer ratings for the Big-Five Inventory personality phrases. The five phrases with the largest positive correlations and the five with the largest negative correlations are reported below.

| | |
|---|---|
| Starts quarrels with others (.25) | Has a forgiving nature (-.33) |
| Can be moody (.13) | Considerate & kind to almost everyone (-.30) |
| Tends to be lazy (.13) | Generally trusting (-.23) |
| Sometimes rude to others (.12) | Values artistic, aesthetic experiences (-.23) |
| Can be cold and aloof (.11) | Helpful & unselfish with others (-.23) |

Table 3.13 presents correlations between Skeptical scale scores and coworkers' description ratings of the target manager's performance. As seen in the table, the highest positive correlation is with the item "Needs attention" (r = .28) and the highest negative correlation is with the item "Is not easily disappointed" (r = -.28). Two other notable relations include correlations with "Feels mistreated" (r = .26) and "Is unassuming" (r = -.21).

Table 3.14 displays two sets of correlations between Skeptical scale scores from a target manager and ratings of that manager provided by a spouse and ratings provided by a coach. In terms of magnitude and direction, the most significantly consistent ratings by spouse and coach, respectively, occurred for the items listed below:

Has trouble trusting (.16, .28)
Easily offended (.13, .18)
Vigilant and watchful (.10, .26)
Overly critical (.05, .19)
Enjoys debating (.03, .13)

*Cautious.* Table 3.11 contains correlations between Cautious scale scores and peer observer ratings for the Big-Five Mini-Marker adjectives. The five items with the largest positive correlations and the five with the largest negative correlations are reported below.

| | |
|---|---|
| Shy (.41) | Extraverted (-.49) |
| Bashful (.39) | Bold (-.40) |
| Quiet (.39) | Talkative (-.38) |
| Withdrawn (.33) | Energetic (-.30) |
| Uncreative (.23) | Imaginative (-.26) |

Table 3.12 lists correlations between Cautious scale scores and observer ratings for the Big-Five Inventory personality phrases. The five phrases with the largest positive correlations and the five with the largest negative correlations are reported below.

| | |
|---|---|
| Sometimes shy/inhibited (.51) | Has an assertive personality (-.50) |
| Tends to be quiet (.44) | Outgoing/sociable (-.43) |
| Is reserved (.39) | Full of energy (-.37) |
| Prefers routine work (.29) | Generates a lot of enthusiasm (-.37) |
| Gets nervous easily (.26) | Original/comes up with new ideas (-.28) |

Table 3.13 presents correlations between Cautious scale scores and coworkers' description ratings of the target manager's performance. As seen in the table, the highest positive correlation is with the item "Is self-doubting" (r = .28) and the highest negative correlation is with the item "Is rational" (r = -.25). Two other notable relations include correlations with "Feels inadequate" (r = .18) and "Enjoys meeting new people" (r = -.19).

Table 3.14 displays two sets of correlations between Cautious scale scores from a target manager and ratings of that manager provided by a spouse and ratings provided by a coach. In terms of magnitude and direction, the most significantly consistent ratings by spouse and coach, respectively, occurred for the items listed below:

Easily embarrassed (.45, .50)
Uneasy with strangers (.39, .48)
Avoids taking risks (.39, .27)
Easily hurt by criticism (.33, .39)
Cautious and worried (.32, .47)

*Reserved.* Table 3.11 contains correlations between Reserved scale scores and peer observer ratings for the Big-Five Mini-Marker adjectives. The five items with the largest positive correlations and the five with the largest negative correlations are reported below.

| | |
|---|---|
| Quiet (.37) | Talkative (-.44) |
| Withdrawn (.30) | Warm (-.35) |
| Shy (.29) | Extraverted (-.32) |
| Unsympathetic (.26) | Sympathetic (-.32) |
| Bashful (.24) | Kind (-.30) |

Table 3.12 lists correlations between Reserved scale scores and observer ratings for the Big-Five Inventory personality phrases. The five phrases with the largest positive correlations and the five with the largest negative correlations are reported below.

| | |
|---|---|
| Tends to be quiet (.39) | Outgoing/sociable (-.44) |
| Is reserved (.33) | Generates a lot of enthusiasm (-.42) |
| Sometimes shy/inhibited (.30) | Has an assertive personality (-.23) |
| Can be cold and aloof (.27) | Original/comes up with new ideas (-.20) |
| Has few artistic interests (.24) | Values artistic, aesthetic experiences (-.20) |

Table 3.13 presents correlations between Reserved scale scores and coworkers' description ratings of the target manager's performance. As seen in the table, the highest positive correlation is with the item "Is self-centered" (r = .19) and the highest negative correlation is with the item "Enjoys meeting new people" (r = -.21). Two other notable relations include correlations with "Is socially inept" (r = .17) and "Is kind" (r = -.18).

Table 3.14 displays two sets of correlations between Reserved scale scores from a target manager and ratings of that manager provided by a spouse and ratings provided by a coach. In terms of magnitude and direction, the most significantly consistent ratings by spouse and coach, respectively, occurred for the items listed below:

Detached (.48, .33)
Withdrawn (.38, .37)
Is comfortable alone (.38, .28)
Tunes people out (.16, .19)
Reserved and formal (.12, .22)

*Leisurely.* Table 3.11 contains correlations between Leisurely scale scores and peer observer ratings for the Big-Five Mini-Marker adjectives. The three items with the largest positive correlations and the three with the largest negative correlations are reported below.

| | |
|---|---|
| Quiet (.19) | Extraverted (-.16) |
| Systematic (.11) | Talkative (-.13) |
| Withdrawn (.11) | Cooperative (-.11) |

Table 3.12 lists correlations between Leisurely scale scores and observer ratings for the Big-Five Inventory personality phrases. The five phrases with the largest positive correlations and the five with the largest negative correlations are reported below.

| | |
|---|---|
| Is reserved (.16) | Generally trusting (-.23) |
| Tends to be quiet (.15) | Outgoing/sociable (-.19) |
| Can be cold and aloof (.15) | Considerate & kind to almost everyone (-.12) |
| Sometimes say/inhibited (.14) | Generates a lot of enthusiasm (-.10) |
| Tends to be lazy (.10) | Tends to be disorganized (-.09) |

Table 3.13 presents correlations between Leisurely scale scores and coworkers' description ratings of the target manager's performance. As seen in the table, the highest positive correlation is with the item "Delegates tasks appropriately" (r = .19) and the highest negative correlation is with the item "Enjoys meeting new people" (r = -.19). Two other notable relations include correlations with "Is resentful" (r = .15) and "Encourages constructive criticism" (r = -.15).

Table 3.14 displays two sets of correlations between Leisurely scale scores from a target manager and ratings of that manager provided by a spouse and ratings provided by a coach. In terms of magnitude and direction, the most significantly consistent ratings by spouse and coach, respectively, occurred for the items listed below:

Feels overburdened (.33, .03)
Feels hurried and pressured (.28, .09)
Procrastinates (.25, .27)
Criticizes authority (.13, .04)
Feels others ask too much (.01, .01)

*Bold.* Table 3.11 contains correlations between Bold scale scores and peer observer ratings for the Big-Five Mini-Marker adjectives. The five items with the largest positive correlations and the five with the largest negative correlations are reported below.

| | |
|---|---|
| Creative (.32) | Uncreative (-.32) |
| Imaginative (.27) | Bashful (-.24) |
| Extraverted ( .26) | Shy (-.22) |
| Efficient (.23) | Withdrawn (-.21) |
| Talkative (.23) | Inefficient (-.20) |

Table 3.12 lists correlations between Bold scale scores and observer ratings for the Big-Five Inventory personality phrases. The five phrases with the largest positive correlations and the five with the largest negative correlations are reported below.

| | |
|---|---|
| Original/comes up with new ideas (.33) | Prefers routine work (-.23) |
| Inventive (.26) | Sometimes shy/inhibited (-.21) |
| Has an active imagination (.25) | Is reserved (-.17) |
| Has an assertive personality (.25) | Tends to be disorganized (-.16) |
| Makes plans and follows through (.25) | Has a forgiving nature (-.14) |

Table 3.13 presents correlations between Bold scale scores and coworkers' description ratings of the target manager's performance. As seen in the table, the highest positive correlation is with the item "Is content with self-image" (r = .19) and the highest negative correlation is with the item "Is self-restrained" (r = -.22). Two other notable relations include correlations with "Is self-promoting" (r = .17) and "Is a follower" (r = -.20).

Table 3.14 displays two sets of correlations between Bold scale scores from a target manager and ratings of that manager provided by a spouse and ratings provided by a coach. In terms of magnitude and direction, the most significantly consistent ratings by spouse and coach, respectively, occurred for the items listed below:

Very confident (.31, .24)
Direct and assertive (.28, .33)
Intensely competitive (.26, .11)
Arrogant (.22, .36)
Self-promoting (.15, .25)

*Mischievous.* Table 3.11 contains correlations between Mischievous scale scores and peer observer ratings for the Big-Five Mini-Marker adjectives. The five items with the largest positive correlations and the five with the largest negative correlations are reported below.

Extraverted (.26)
Careless (.23)
Energetic (.22)
Jealous (.19)
Imaginative (.17)

Cooperative (-.18)
Bashful (-.17)
Kind (-.16)
Practical (-.13)
Sympathetic (-.12)

Table 3.12 lists correlations between Mischievous scale scores and observer ratings for the Big-Five Inventory personality phrases. The five phrases with the largest positive correlations and the five with the largest negative correlations are reported below.

Full of energy (.21)
Has an active imagination (.19)
Can be somewhat careless (.16)
Generates a lot of enthusiasm (.16)
Has an assertive personality (.16)

Is reserved (-.21)
Prefers routine work (-.21)
Has a forgiving nature (-.11)
Tends to be quiet (-.11)
Generally trusting (-.11)

Table 3.13 presents correlations between Mischievous scale scores and coworkers' description ratings of the target manager's performance. As seen in the table, the highest positive correlations are with the items "Is deceitful" (r = .17) and "Is arrogant" (r = .17), and the highest negative correlations are with the items "Is a follower" (r = -.16) and "Is unassuming (r = -.16). Two other notable relations include correlations with "Is independent" (r = .16) and "Tests the limits" (r = .14).

Table 3.14 displays two sets of correlations between Mischievous scale scores from a target manager and ratings of that manager provided by a spouse and ratings provided by a coach. In terms of magnitude and direc-

tion, the most significantly consistent ratings by spouse and coach, respectively, occurred for the items listed below.

Smooth talker (.32, .32)
Bends the rules (.30, .41)
Enjoys being in the 'fast lane' (.29, .68)
Does not follow through (.16, .21)
Seeks entertainment (.12, .71)

*Colorful.* Table 3.11 contains correlations between Colorful scale scores and peer observer ratings for the Big-Five Mini-Marker adjectives. The five items with the largest positive correlations and the five with the largest negative correlations are reported below.

| | |
|---|---|
| Extraverted (.41) | Quiet (-.42) |
| Talkative (.34) | Shy (-.36) |
| Bold (.32) | Bashful (-.34) |
| Energetic (.30) | Withdrawn (-.25) |
| Careless (.26) | Relaxed (-.23) |

Table 3.12 lists correlations between Colorful scale scores and observer ratings for the Big-Five Inventory personality phrases. The five phrases with the largest positive correlations and the five with the largest negative correlations are reported below.

| | |
|---|---|
| Outgoing/sociable (.37) | Tends to be quiet (-.42) |
| Generates a lot of enthusiasm (.34) | Sometimes shy/inhibited (-.39) |
| Has an assertive personality (.33) | Is reserved (-.33) |
| Full of energy (.28) | Prefers routine work (-.25) |
| Can be somewhat careless (.22) | Is depressed/blue (-.15) |

Table 3.13 presents correlations between Colorful scale scores and coworkers' description ratings of the target manager's performance. As seen in the table, the highest positive correlation is with the item "Tests the limits" (r = .27) and the highest negative correlations are with the items "Is self-restrained", "Is quiet" and "Questions people's loyalty" (r = -.24). Two other notable relations include correlations with "Is the 'life of the office'" (r = .17) and "Is detail-oriented" (r = -.17).

Table 3.14 displays two sets of correlations between Colorful scale scores from a target manager and ratings of that manager provided by a spouse and ratings provided by a coach. In terms of magnitude and direction, the most significantly consistent ratings by spouse and coach, respectively, occurred for the items listed below:

Life of the party (.40, .52)
Attracts attention (.38, .32)
Craves recognition (.33, .30)
Entertaining (.26, .35)
Wants to be noticed (.26, .24)

*Imaginative.* Table 3.11 contains correlations between Imaginative scale scores and peer observer ratings for the Big-Five Mini-Marker adjectives. The five items with the largest positive correlations and the five with the largest negative correlations are reported below.

| | |
|---|---|
| Imaginative (.29) | Uncreative (-.18) |
| Creative (.22) | Bashful (-.16) |
| Bold (.20) | Withdrawn (-.14) |
| Careless (.15) | Organized (-.13) |
| Philosophical (.15) | Shy (-.11) |

Table 3.12 lists correlations between Imaginative scale scores and observer ratings for the Big-Five Inventory personality phrases. The five phrases with the largest positive correlations and the five with the largest negative correlations are reported below.

| | |
|---|---|
| Curious about many different things (.35) | Prefers routine work (-.25) |
| Inventive (.28) | Has few artistic interests (-.21) |
| Has an active imagination (.25) | A reliable worker (-.18) |
| Original/comes up with new ideas (.24) | Does a thorough job (-.15) |
| Likes to reflect/play with ideas (.21) | Sometimes shy/inhibited (-.15) |

Table 3.13 presents correlations between Imaginative scale scores and coworkers' description ratings of the target manager's performance. As seen in the table, the highest positive correlation is with the item "Engages in horseplay" (r = .22) and the highest negative correlation is with the item "Is self-restrained" (r = -.20). Two other notable relations include correlations with "Has odd attitudes" (r = .17) and "Is predictable" (r = -.18).

Table 3.14 displays two sets of correlations between Imaginative scale scores from a target manager and ratings of that manager provided by a spouse and ratings provided by a coach. In terms of magnitude and direction, the most significantly consistent ratings by spouse and coach, respectively, occurred for the items listed below:

Unconventional (.45, .25)
Creative (.18, .14)
Socially insightful (-.13, -.15)
Imaginative (.12, .13)
Has unusual ideas (.09, .27)

*Diligent.* Table 3.11 contains correlations between Diligent scale scores and peer observer ratings for the Big-Five Mini-Marker adjectives. The four items with the largest positive correlations and the four with the largest negative correlations are reported below.

| | |
|---|---|
| Organized (.36) | Disorganized (-.36) |
| Systematic (.34) | Sloppy (-.31) |
| Efficient (.31) | Inefficient (-.29) |
| Practical (.19) | Careless (-.17) |

Table 3.12 lists correlations between Diligent scale scores and observer ratings for the Big-Five Inventory personality phrases. The five phrases with the largest positive correlations and the five with the largest negative correlations are reported below.

| | |
|---|---|
| Does things efficiently (.28) | Can be somewhat careless (-.38) |
| Does a thorough job (.25) | Tends to be disorganized (-.34) |
| Makes plans and follows through (.24) | Easily distracted (-.25) |
| Perseveres until the task is finished (.19) | Has a forgiving nature (-.17) |
| Has an assertive personality (.16) | Tends to be lazy (-.15) |

Table 3.13 presents correlations between Diligent scale scores and coworkers' description ratings of the target manager's performance. As seen in the table, the highest positive correlation is with the item "is detail-oriented" (r = .22) and the highest negative correlation is with the item "Is uninterested in close relationships" (r = -.17). Two other notable relations include correlations with "Is polite" (r = .20) and "Is perfectionistic" (r =.15).

Table 3.14 displays two sets of correlations between Diligent scale scores from a target manager and ratings of that manager provided by a spouse and ratings provided by a coach. In terms of magnitude and direction, the most significantly consistent ratings by spouse and coach, respectively, occurred for those items listed below.

Organized (.57, .32)
Good with details (.40, .30)
Overly conscientious (.35, .42)
Precise and accurate (.35, .38)
Perfectionistic (.32, .30)

*Dutiful.* Table 3.11 contains correlations between Dutiful scale scores and peer observer ratings for the Big-Five Mini-Marker adjectives. The five items with the largest positive correlations and the five with the largest negative correlations are reported below.

| | |
|---|---|
| Kind (.25) | Imaginative (-.28) |
| Sympathetic (.19) | Rude (-.23) |
| Uncreative (.18) | Bold (-.21) |
| Cooperative (.15) | Complex (-.20) |
| Quiet (.14) | Creative (-.20) |

Table 3.12 lists correlations between Dutiful scale scores and observer ratings for the Big-Five Inventory personality phrases. The five phrases with the largest positive correlations and the five with the largest negative correlations are reported below.

| | |
|---|---|
| Likes to cooperate with others (.28) | Ingenious/deep thinker (-.23) |
| Sometimes shy/inhibited (.24) | Sometimes rude to others (-.22) |
| Gets nervous easily (.24) | Inventive (-.17) |
| Helpful & unselfish with others (.23) | Has an assertive personality (-.17) |
| Considerate & kind to almost everyone (.22) | Likes to reflect/play with ideas (-.15) |

Table 3.13 presents correlations between Dutiful scale scores and coworkers' description ratings of the target manager's performance. As seen in the table, the highest positive correlations are with the items "Is predictable" (r = .15) and "Is a follower" (r = .15), and the highest negative correlations are with the items "Makes own decisions" (r = -.13) and "Is non-conforming" (r = -.13). Two other notable relations include correlations with "Is self-restrained" (r = .13) and "Is rude" (r = -.13).

Table 3.14 displays two sets of correlations between Dutiful scale scores from a target manager and ratings of that manager provided by a spouse and ratings provided by a coach. In terms of magnitude and direction, the most significantly consistent ratings by spouse and coach, respectively, occurred for the items listed below:

Prefers working with others (.43, .12)
Soothing and comforting (.23, .21)
Defers to others' opinions (.19, .10)
Self-sacrificing (.14, .18)
Loyal follower (.11, .30)

## 3.4 HDS Correlates of Organizational Behavior in Managerial and Professional Jobs

This section examines the relationships between HDS scale scores and various aspects of organizational performance in managerial and professional jobs. We are concerned with how the HDS scale scores are related to non-test behaviors, where the construct of interest is hypothesized to underlie both the HDS scale and the criterion assessed. Earlier research concerning the relationship between personality and occupational performance often failed to distinguish correctly between the various components of personality (e.g., because all dimensions of personality were thought to be somehow interchangeable).

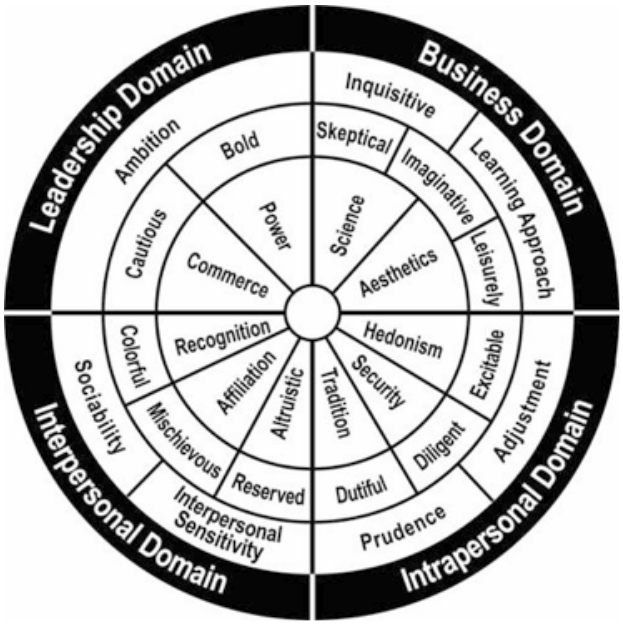
The earlier research also failed, on many occasions, to use measures that were appropriate for the non-test criteria in terms of the underlying construct (e.g., measures of interpersonal competence might be used to predict training performance). Results presented by Hough et al. (1990) illustrate the point. When any personality scale is used to predict any criteria, virtually no relationships emerge (see also Pearlman, 1985). Using measures of single constructs to predict any criteria leads to modest results. However, when measures of single constructs are used to predict relevant criteria, the correlations improve substantially (J. Hogan & Holland,

2003). The results described by Hough et al. (1990) as well as Hogan and Holland (2003) provide empirical support for Campbell's (1990) point that meaningful test-non-test correlations can only be found when the latent structure underlying both the predictor and the criterion constructs is similar. In this section, we organize our discussion around aligned HDS predictors and performance competency criteria.

### 3.4.1 Competency Domains of Job Performance

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. We believe that every existing competency model can be organized in terms of a "domain model" first proposed by Warrenfeltz (1995). The model contains 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 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 and the later skills are easier to train. Figure 3.1 describes the conceptual relation between the HDS scales (along with personality and motives scales) and competency domains of organizational performance (R. Hogan, Hogan, & Warrenfeltz, 2007).

FIGURE 3.1
Domain Model of Organizational Performance



*Intrapersonal Skills.* Intrapersonal skills develop early in childhood and then have important consequences for career development in adulthood. Two components underlie the domain of intrapersonal skills. The first is core self-esteem, emotional security, or resiliency (Erez & Judge, 2001; Judge & Bono, 2001). People with core self-esteem are self-confident, even-tempered, and positive; they are not easily frustrated, and they bounce back quickly from reversals and disappointments. Persons who lack core self-esteem are self-critical, moody, unhappy, easily frustrated, and need frequent reassurance. Core self-esteem is easily assessed using any well-validated personality measure of emotional stability from the FFM as well as the HDS Excitable scale. More importantly, measures of core self-esteem predict a wide variety of career outcomes, including job satisfaction and performance evaluations (Judge & Bono, 2001).

The second component of intrapersonal skills concerns self-control. Self-controlled people follow rules and respect authority; they are conforming, socially appropriate, and easy to supervise. Persons with low self-control ignore rules and procedures; they are rebellious, refractory, and hard to supervise. Self-control is easily assessed using well-validated personality measures of FFM emotional stability and conscientiousness (J. Hogan & Hogan, 1989) as well as the HDS Diligent and Dutiful scales. Self-control predicts a wide variety of career outcomes, including supervisors' ratings of satisfactoriness (J. Hogan & Holland, 2003).

Intrapersonal skill is the foundation on which careers develop. Persons with good intrapersonal skills project integrity, which is perhaps the most important characteristic in employability. It is a prerequisite for getting along with others because persons who act with integrity gain the reputation of being responsible, dependable, and trustworthy.

*Interpersonal Skills.* Interpersonal skills concern building and sustaining relationships. People with good interpersonal skills seem socially adept, approachable, and rewarding to deal with. R. Hogan and Warrenfeltz (2003) describe interpersonal skills in terms of three components. The first is a disposition to put oneself in the place of another person, to anticipate how that person sees the world and what he/she expects during an interaction. The second component involves getting it right when one seeks to anticipate. The third component involves incorporating the information about the other person's expectations into one's subsequent behavior.

Interpersonal skill concerns building and maintaining relationships with a variety of people who might differ from oneself in terms of demographic and psychological characteristics. Interpersonal skill is easily measured using well-validated personality measures of FFM extraversion and agreeableness (Bartram, 2005) as well as the HDS Reserved scale. In addition, we expect that some degree of HDS Mischievous and Colorful will contribute to a person seeming interpersonally charismatic. Good measures of interpersonal skill predict a wide range of occupational outcomes, including supervisory performance (cf. J. Hogan & Hogan, 2001; Riggio, 1989). These skills are prerequisite for getting along with others because they are the foundation for establishing and sustaining relationships.

*Technical Skills.* The domain of technical skills is included in every comprehensive model of performance; it differs from the preceding two domains in several ways. Technical skills can be taught, and they are the least dependent on being able to deal with other people. Technical skills involve comparing, copying, compiling, computing, analyzing, coordinating, innovating, synthesizing, and so on (Peterson, Mumford, Borman, Jeanneret, & Fleishman, 1999). These skills can be assessed using work simulations, assessment center exercises, and content-valid tests; the best predictors of individual differences in technical skills are measures of cognitive ability (J. Hunter & Hunter, 1984; Ree & Earles, 1992).

Interest in training and acquiring new technical knowledge is also part of this domain. The tendency to value education can be assessed using well-validated measures of the FFM dimension of openness to experience. In addition, openness to new ideas is associated with the HDS Imaginative scale, along with a healthy degree of HDS Skeptical and interest in one's own agenda (moderate HDS Leisurely). These measures predict technical outcomes such as supervisor ratings of judgment, market savvy, training progress, and job knowledge (J. Hogan & Holland, 2003). Technical skills are prerequisite for getting ahead because persons who seem knowledgeable and competent are a resource for the performance of their group.

*Leadership Skills.* Leadership skills are relevant for performance in virtually any job, but particularly in managerial and professional jobs. Leadership skills, which concern building and maintaining effective teams, can be understood in terms of five components; these depend on intrapersonal, interpersonal, and technical skills.

The first component is recruiting talented people to a team. The second component involves retaining that talent once it is recruited. The third component of leadership skills concerns motivating a team; other things being equal, a motivated team will outperform a talented but less motivated group. Recruiting, retaining, and motivating team members depend on building positive relationships with each team member, a capability that builds on the interpersonal skills described above. The fourth component concerns developing and promoting a vision for the team. The vision legitimizes the team enterprise. Technical competence is needed to develop the vision, and interpersonal skills are needed to sell it. The final component of leadership skill concerns being persistent and hard to discourage. Persistence probably depends on core self-esteem and conscientiousness, although there is little research on the topic.

Leadership skill can be assessed using any number of well-validated procedures, although the most effective assessment uses a combination of methods. Historically, assessment centers have been used extensively. Recent meta-analyses indicate that measures of cognitive ability (Judge, Colbert, & Ilies, 2004) and personality substantially predict both leadership emergence and effectiveness (Judge, Bono, Ilies, & Gerhardt, 2002). On the HDS, strength in the leadership domain is marked by aggressive self-confidence (moderate scores on the HDS Bold scale) and by a willingness to take measured risks (low scores on the HDS Cautious scale). Leadership skills are prerequisite for getting ahead because leadership by definition involves the pursuit of status.

*Summary.* We use the domain model to organize the content of performance, and its measurement in validation research. The four competency domains are inclusive and exhaustive; they also resemble Hough and colleagues' notion of taxons (Hough & Ones, 2001; Hough & Schneider 1996). Both approaches are flexible and inclusive, and in validation research, flexibility and inclusiveness are essential because every organization views its jobs as unique.

Next, we describe HDS-based meta-analyses that evaluate the links between personality and rated job performance competencies. This research provides further evidence for the construct validity of the primary HDS scales.

### 3.4.2 Methods Used for Meta-Analysis

We identified 26 independent samples (total N = 3,059) from published articles, chapters, technical reports, and dissertations between 1997 and 2008 that were catalogued in the Hogan Assessment Systems' archive (see Appendix B). The studies met the following criteria: (a) they used job analysis to estimate personality-based job requirements; (b) they used a concurrent (k = 11) or predictive (k = 15) validation strategy with working adults; (c) the criteria were content explicit, not just overall job performance, and these were classified reliably by Subject Matter Experts (SMEs); and (d) the predictor variables were scales of the HDS. We excluded studies using: (a) clinical patients and therapists; (b) undergraduate or graduate students; (c) self-reported performance criteria; (d) performance criteria other than ratings; (e) only an overall performance criterion; (f) laboratory or assessment center studies; and (g) studies unrelated to work contexts.

Studies compiled for the meta-analysis are from occupational samples of managers, executives, and professionals. The studies included are empirical validation studies with either supervisor ratings as criteria or 360 degree feedback ratings as criteria. All data were collected in the English language, although some studies were completed using data collected outside of the US. All studies included one or more types of job analyses during the initial stages of the research. Over 40% of the studies (k = 11) used an evaluation of job competencies that led to the development of competency-based criterion rating scales. Several studies used worker-oriented methods to determine the knowledge, skills, and abilities required for successful job performance. These job analyses generally followed the Goldstein, Zedeck, and Schneider (1993) method for content validation research (cf. R. Hogan & Hogan, 1995, p. 75). The remaining studies (k =15) used the Job Evaluation Tool. This personality-based job analysis uses questionnaire rating items to profile jobs in terms of the FFM dimensions, derailment characteristics, work group values, and competencies required. Raymark, Schmit, and Guion (1997) describe a similar method for evaluating personality-based job requirements. Although job analysis results are often used to justify predictor measures, these results were used to develop criterion dimensions.

*Meta-Analysis Procedures.* We used the meta-analytic procedures specified by Hunter and Schmidt (1990) to cumulate results across studies and to assess effect sizes. All studies used zero-order product-moment

correlations, which eliminated the need to convert alternative statistics to values of r. Corrections were made for sampling error, unreliability in the measures, and range restriction. Reliability of the personality measures was estimated using within-study coefficient alpha [M = .59; range = .43 (Leisurely) to .68 (Cautious, Colorful)], rather than relying exclusively on the values reported in the 1997 HDS manual. Although some researchers (e.g., Murphy & De Shon, 2000) argue against the use of rater-based reliability estimates, we followed procedures outlined by Barrick and Mount (1991) and Tett et al. (1991), and used the .508 reliability coefficient proposed by Rothstein (1990) as the estimate of the reliability of supervisory ratings of job performance. The frequency-weighted mean of the job performance reliability distribution was .59, which is comparable to the value of .56 reported by Barrick and Mount (1991), and the mean square root reliability of .76 corresponds to the value of .778 reported by Tett et al. (1991). Also, we computed a range restriction index for HDS scales. Following procedures described by Hunter and Schmidt (1990), we divided each HDS scale's within-study standard deviation by the standard deviation reported in Chapter 2. This procedure produced an index of range restriction for each HDS scale within each study, and we used these values to correct each predictor scale for range restriction.

Hunter and Schmidt (1990) point out that meta-analytic results can be biased unless each sample contributes about the same number of correlations to the total. To eliminate such bias, we averaged correlations within studies so that each sample contributed only one point estimate per predictor scale. For example, if more than one criterion from any study was classified as "Leadership," the correlations between each predictor scale and those criteria were averaged 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). We did not correct correlation coefficients to estimate validity at the construct level. Although some (e.g., Mount & Barrick, 1995a; Ones, Schmidt, & Viswesvaran, 1994) argue this is a relevant artifact that can be corrected, we believe it is premature to estimate the validity of the perfect construct when there is no firm agreement on the definition of the perfect construct.

*Results.* Table 3.15 presents the validity results for the HDS scales aligned by competency domain and competency criterion. Note that these are selected results based on construct alignment; the full matrix of estimated true validities by scale and competency criterion is seen in Appendix C. Although each competency domain contains two or three constituent HDS scales, we did not aggregate correlations to estimate validities at the competency domain level.

Table 3.15

Meta-Analysis Results for HDS Scales Aligned with Competency Domains and Criteria

| **Intrapersonal Domain** | ***K*** | ***N*** | ***Avg N*** | ***r obs*** | $SD_r$ | $\rho_v$ | $\rho$ | $SD_\rho$ | ***%VE*** | ***90% CV*** |
|---|---|---|---|---|---|---|---|---|---|---|
| Excitable | | | | | | | | | | |
| Active Listening | 3 | 349 | 116 | -0.20* | 0.14 | -0.21* | -0.27* | 0.21 | 58 | -0.48 |
| Building Relationships | 7 | 656 | 94 | -0.10 | 0.16 | -0.11 | -0.14 | 0.21 | 72 | -0.32 |
| Caring | 2 | 249 | 125 | -0.21* | 0.06 | -0.21* | -0.27* | 0.07 | 100 | -0.27 |
| Citizenship | 6 | 218 | 36 | -0.17* | 0.14 | -0.20* | -0.25* | 0.21 | 100 | -0.26 |
| Planning/Organizing | 7 | 782 | 112 | -0.09* | 0.07 | -0.10* | -0.12* | 0.09 | 100 | -0.12 |
| Professionalism | 4 | 1283 | 321 | -0.11* | 0.06 | -0.14* | -0.18* | 0.10 | 100 | -0.17 |
| Stress Tolerance | 10 | 1095 | 110 | -0.15* | 0.17 | -0.18* | -0.23* | 0.25 | 43 | -0.55 |
| Diligent | | | | | | | | | | |
| Detail Orientation | 4 | 369 | 92 | 0.12* | 0.09 | 0.15* | 0.21* | 0.16 | 100 | 0.21 |
| Organizational Commitment^ | 2 | 42 | 21 | -0.30 | 0.30 | -0.38 | -0.51 | 0.48 | 61 | -1.00 |
| Dutiful | | | | | | | | | | |
| Building Teams | 5 | 261 | 52 | 0.12* | 0.09 | 0.17* | 0.25* | 0.22 | 100 | 0.24 |
| Organizational Commitment^ | 2 | 42 | 21 | -0.25* | 0.07 | -0.32* | -0.48* | 0.17 | 100 | -0.47 |
| Talent Management | 4 | 287 | 72 | -0.09 | 0.17 | -0.14 | -0.21 | 0.38 | 40 | -0.68 |
| **Interpersonal Domain** | ***K*** | ***N*** | ***Avg N*** | ***r obs*** | $SD_r$ | $\rho_v$ | $\rho$ | $SD_\rho$ | ***%VE*** | ***90% CV*** |
| Reserved | | | | | | | | | | |
| Interpersonal Skills | 4 | 233 | 58 | -0.17 | 0.22 | -0.22 | -0.30 | 0.36 | 42 | -0.74 |
| Managing Performance | 6 | 209 | 35 | -0.11 | 0.26 | -0.15 | -0.20 | 0.43 | 52 | -0.69 |
| Oral Communication^ | 11 | 1248 | 113 | -0.08* | 0.10 | -0.11* | -0.15* | 0.18 | 92 | -0.23 |
| Work Attitude | 10 | 857 | 86 | -0.15* | 0.16 | -0.20* | -0.26* | 0.25 | 59 | -0.53 |
| Mischievous | | | | | | | | | | |
| Dependability | 8 | 788 | 99 | -0.14* | 0.12 | -0.21* | -0.27* | 0.24 | 50 | -0.54 |
| Organizational Commitment^ | 2 | 42 | 21 | 0.21* | 0.09 | 0.31* | 0.40* | 0.17 | 100 | 0.40 |
| Colorful | | | | | | | | | | |
| Trustworthiness | 17 | 1414 | 83 | -0.11* | 0.10 | -0.15* | -0.19* | 0.16 | 100 | -0.19 |

Table 3.15 cont.

Meta-Analysis Results for HDS Scales Aligned with Competency Domains and Criteria

| **Business Domain** | ***K*** | ***N*** | ***Avg N*** | ***r obs*** | $SD_r$ | $\rho_v$ | $\rho$ | $SD_\rho$ | ***%VE*** | ***90% CV*** |
|---|---|---|---|---|---|---|---|---|---|---|
| Skeptical | | | | | | | | | | |
| Business Acumen | 7 | 668 | 95 | 0.02 | 0.16 | 0.03 | 0.04 | 0.17 | 100 | 0.04 |
| Goal Setting | 2 | 225 | 113 | -0.13* | 0.07 | -0.20* | -0.25* | 0.20 | 60 | -0.47 |
| Oral Communication^ | 11 | 1248 | 113 | -0.09* | 0.06 | -0.13* | -0.16* | 0.11 | 100 | -0.16 |
| Organizational Commitment^ | 2 | 42 | 21 | -0.19* | 0.13 | -0.31* | -0.39* | 0.27 | 100 | -0.39 |
| Leisurely | | | | | | | | | | |
| Achievement Orientation | 16 | 1194 | 75 | -0.09* | 0.15 | -0.13* | -0.19* | 0.33 | 54 | -0.56 |
| Initiative | 6 | 1469 | 245 | -0.08* | 0.07 | -0.11* | -0.17* | 0.16 | 74 | -0.30 |
| Leadership | 19 | 2437 | 128 | -0.07* | 0.08 | -0.10* | -0.15* | 0.16 | 100 | -0.15 |
| Risk Management | 4 | 128 | 32 | -0.18* | 0.09 | -0.24* | -0.36* | 0.15 | 100 | -0.36 |
| Imaginative | | | | | | | | | | |
| Decision Making | 15 | 1484 | 99 | -0.07* | 0.10 | -0.10* | -0.13* | 0.20 | 80 | -0.28 |
| Influence | 7 | 551 | 79 | -0.08* | 0.11 | -0.13* | -0.16* | 0.22 | 83 | -0.30 |
| Problem Solving | 5 | 465 | 93 | -0.07 | 0.09 | -0.10 | -0.13 | 0.17 | 100 | -0.13 |
| **Leadership Domain** | ***K*** | ***N*** | ***Avg N*** | ***r obs*** | $SD_r$ | $\rho_v$ | $\rho$ | $SD_\rho$ | ***%VE*** | ***90% CV*** |
| Cautious | | | | | | | | | | |
| Delegation | 2 | 398 | 199 | -0.16* | 0.11 | -0.28* | -0.34* | 0.24 | 23 | -0.69 |
| Flexibility | 8 | 754 | 94 | -0.12* | 0.14 | -0.20* | -0.24* | 0.28 | 37 | -0.60 |
| Motivating Others | 5 | 473 | 95 | -0.13* | 0.12 | -0.18* | -0.22* | 0.21 | 61 | -0.44 |
| Bold | | | | | | | | | | |
| Negotiation | 5 | 580 | 116 | 0.09* | 0.05 | 0.13* | 0.15* | 0.11 | 100 | 0.15 |

*Note.* ^ competency appears across more than one HDS scale; * Correlation is significant at $p < .05$; K = Number of studies; N = Total number of participants across K studies; Avg N = Average number of participants within each study; r obs = Mean observed validity; SDr = SD of observed correlations; ρv = Operational validity corrected for range restriction and criterion unreliability; ρ = True validity at scale level corrected for predictor unreliability ; SDρ = SD of true validity; %VE = Percentage of variance explained; 90% CV = Credibility value.

The sample weighted mean correlations and estimated true validities across the HDS scales aligned with the Intrapersonal competency domain are consistently larger than for HDS scales associated with the other competency domains. In particular, the Excitable scale is the most predictive scale on the HDS of undesirable outcome criteria—not caring about others, not listening to others, exhibiting poor citizenship, and an inability to handle stress effectively. Note the construct themes of an inability to maintain relationships and poor emotional control. Considering the seven competency criteria aligned with the Excitable scale, the estimated true validities ranged from -.12 (Planning/Organizing) to -.27 (Caring). The lower bound credibility intervals are all greater than -.12 in the negative direction, which suggests that the Excitable scale validity generalizes across samples when criteria are classified by construct.

Interestingly, there are only five true validity estimates contained in Table 3.15 with predictor-criterion aligned measures that are positive. These positive correlations support the basic theme of the predictor content, although they do not represent the extreme behavior indicated by the linear relations presented in Section 3.5, case studies of "underdoing" and "overdoing." For the Diligent scale in Table 3.15, the estimated true validity for ratings on the competency "Detail Orientation" is .21. That higher scores on Diligence are associated with higher ratings for detail orientation is a logical outcome evaluation. Similarly, the estimated true validity of the Dutiful scale with "Building Teams" is .25. Higher Dutiful scorers are not independent; they rely on others for advice and direction, and, consequently, are seen as team enhancers because they won't defy authority.

As seen in Table 3.15, estimated true validities across HDS scales aligned with the Interpersonal competency domain also reflect the construct themes that appear in other analyses. Higher Reserved scores are associated with poor interpersonal skills ($\rho$ = -.30) and poor work attitude ($\rho$ = -.26). High Mischievous scores are associated with being seen as undependable ($\rho$ = -.27). High Colorful scorers tend to be evaluated as untrustworthy ($\rho$ = -.19), possibly due to their inconsistent and erratic behavior.

Results in Table 3.15 also contain estimated true validities across HDS scales aligned with the Business competency domain. The highest validities for relations in this domain appear for Skeptical and Leisurely. Higher Skeptical scores are associated with poor communication skills ($\rho$ = -.16), ineffective goal setting ($\rho$ = -.25), and lacking organizational commitment ($\rho$ = -.39). Higher Leisurely scores are associated with poor risk management ($\rho$ = -.36). However, note that some of these predictor-criterion relations are based on relatively fewer studies and individuals than other relationships in this table.

Finally, Table 3.15 shows the estimated true validities across the HDS scales aligned with the Leadership competency domain. These validities reflect some of the same content themes seen with the construct validity analyses presented in Sections 3.2 and 3.3. Higher Cautious scores are associated with an unwillingness to delegate ($\rho$ = -.34), lack of flexibility ($\rho$ = -.24), and failure to motivate others ($\rho$ = -.22). However, high Bold scorers tend to be regarded as effective in negotiation ($\rho$ = .15), which is consistent with their evaluations for being talkative and assertive (Tables 3.11 and 3.12).

### 3.4.3 Curvilinear Relations

For managerial and leadership performance, Benson (2006; Benson & Campbell, 2007) raises the possibility that the personality-performance relationship could be non-linear. He reasons that because leadership involves interpersonal influence, the leader's personality can be seen having too much or too little behavioral impact. This is consistent with Kaplan and Kaiser's (2006) proposal that one way managers fail to realize their potential is by either overdoing or underdoing a critical dimension of performance. That is, there is an optimum performance for leadership competences; when requisite skills are taken to the extremes, performance problems emerge.

Benson (2006; Benson & Campbell, 2007) investigated the relations between managers' HDS scale scores and leadership performance ratings obtained from supervisors and peers. The research sample included management-level employees (N = 326) from a US-based, multinational transportation company, where 88% of the sample was male, 84% was white, and 89% report "some college" education. The sample completed the HDS and each manager was rated on a multi-rater feedback tool by supervisors and peers (and subordinates). Complete predictor-criterion data were available for 290 focal participants.

The HDS was scored for its three factor structure themes: moving away (Excitable, Skeptical, Cautious, Reserved, and Leisurely), moving against (Bold, Mischievous, Colorful, and Imaginative), and moving toward (Diligent and Dutiful). The multi-rater feedback tool measured four content types of performance including business, results, people, and self leadership. Also, an overall leadership rating combined data from the four averaged performance dimensions.

Two sets of results are of interest. First, concerning the linear relations with the rating criterion dimensions, the most significant predictive HDS factors include the moving away (r's range between -.31 to -.27) and moving against (r's ranged from -.15 to -.13) factors. No significant correlations were obtained for the HDS moving toward factor and the criterion composites. Second, concerning the curvilinear relations, regressions indicated that no quadratic terms for HDS moving away and moving toward composites reached significant levels for $\Delta R^2$. However, evaluation of the results from the HDS moving against composite and the five aggregated criteria separately (see Benson & Campbell, 2007, p. 244) suggests that the concave downward curves are evidence of the quadratic trend. Useful for practitioners, Benson illustrates how point estimates can be calculated to identify the values beyond which predictor scores correspond to decreasing leadership performance scores.

## 3.5 HDS Relations with the Leadership Versatility Index (LVI): A Case Study

Because the dysfunctional personality characteristics comprising the HDS are associated with derailing behaviors at work, general trends should illustrate that elevated scores on these scales accompany deficiencies or excesses in metrics of job performance. Moreover, those with elevated scores on these scales should report a higher incident rate than individuals who have lower scale scores. With these hypotheses in mind, we evaluated the utility of HDS results against real-world job performance ratings.

Specifically, to illustrate the application of the HDS in practice, we present an in-depth case study of 54 senior managers who completed the HDS and were subsequently rated by co-workers on the Leadership Versatility Index (LVI; Kaplan & Kaiser, 2006).

### 3.5.1 Leadership Versatility Index

The Leadership Versatility Index (LVI) measures versatility along two complimentary pairs of leadership dimensions: (a) Forceful and Enabling Leadership, and (b) Strategic and Operational Leadership. Each pair is a combination of opposites, with the first pair assessing how a manager leads and the second measuring what

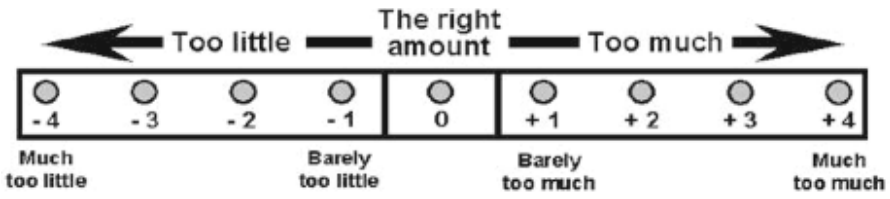
they lead. To be good at both dimensions in each pairing is the essence of leader versatility. The four dimensions of the LVI, definitions of those dimensions, and sub-dimensions associated with each dimension appear in Table 3.16.

Table 3.16
The Leadership Versatility Index (LVI) Content Model

| **How You Lead** | |
|---|---|
| *Forceful Leadership – Exercising power and authority to push for performance* | *Enabling Leadership – Creating conditions for others to influence and contribute* |
| • Takes charge | • Empowers |
| • Declares/decides | • Listens/includes |
| • Pushes | • Supports |
| **What You Lead** | |
| *Strategic Leadership – Positioning the organization to be competitive in the future* | *Operational Leadership – Driving the organization to get results in the near term* |
| • Direction | • Execution |
| • Growth | • Efficiency |
| • Innovation | • Order |

The LVI is a 55-item performance appraisal survey assessing each of the dimensions and sub-dimensions provided in Table 3.16. The LVI asks respondents to rate their manager along 12 complimentary pairs of Forceful-Enabling items, 12 pairs of Strategic-Operational items, as well as seven items assessing overall effectiveness. However, the rating scale of the LVI stands as its most innovative feature. This rating scale appears below in Figure 3.2. Unlike typical linear rating scales, where higher scores are "better," the most desirable score on the LVI falls in the middle of the scale at a score of "0." This scale rests on the premise that suboptimal performance can result from underdoing a behavior, but also overdoing the behavior as well. As such, negative scores indicate perceptions among raters that the manager does not engage in a behavior frequently enough or with sufficient intensity. In contrast, positive scores indicate that raters think the manager engages in a behavior too often or with excess intensity. Again, scores close to "0" are ideal, indicating that others think the manager engages in behaviors with appropriate frequency and intensity.

Figure 3.2
The Leadership Versatility Index (LVI) Rating Scale

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From an intuitive perspective, it is obvious that certain managers get themselves into trouble by over-engaging in certain behaviors, whether those involve talking too much, pushing too hard, delegating too much authority, getting bogged down in details, and the like. In the context of these behaviors, that is how strengths become weaknesses. However, most 360-degree performance appraisal instruments do not measure overdoing, because they are designed only to pick up on deficiencies. In contrast, the LVI rating scale captures both deficiencies and excesses, as well as optimal balance, in managerial performance. This feature makes the LVI a natural compliment to the HDS, which assesses elements of the individual's personality that can become derailers when overused in times of stress, pressure, or poor interpersonal vigilance.

### 3.5.2 HDS and LVI Relations

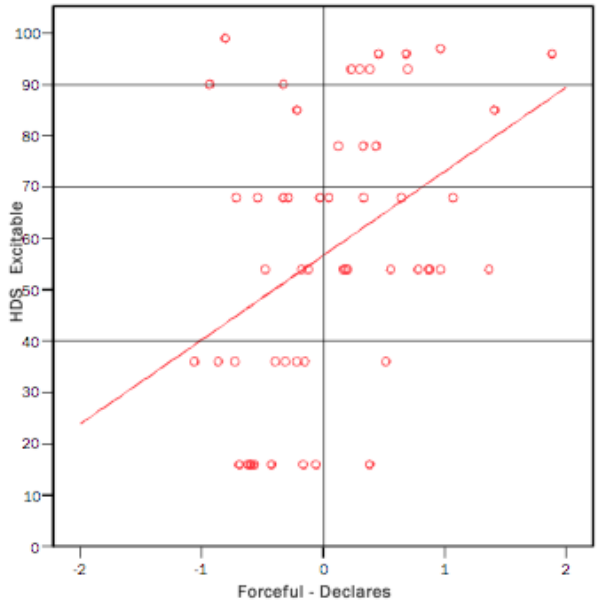
For the purposes of this case study, 54 senior managers completed the HDS and were subsequently rated by their peers on the dimensions and sub-dimensions of the Leadership Versatility Index (LVI). We analyzed the relationships between HDS and LVI scales to illustrate how elevations in HDS scales relate to deficient or excessive managerial behavior. For these analyses, we considered the relationship between each HDS scale and each LVI dimension as a 2x2 table. Specifically, scores on each LVI dimension separate along the ideal score of "0" to form "too little" and "too much" score ranges for each dimension. Likewise, we split scores on each HDS scale into "elevated" and "not elevated" groups along the 70th percentile. Using these four cells in each graph, we present one example for each HDS scale below.

*Excitable.* Recall from the previous sections of Chapter 3 that the Excitable scale concerns being unpredictable, easily annoyed, moody, and over-reacting to difficult situations. As might be expected, this scale correlates positively (r = .33) with the Forceful Declares dimension of the LVI, measuring decisive action, use of command skills, and not backing down easily. The graph displayed in Figure 3.3 displays the scores for our sample of 54 senior managers on both dimensions.

As Figure 3.3 illustrates, highly excitable managers tend to "overdo" behaviors associated with forceful declarative leadership. Specifically, 75% of the senior managers with elevated Excitable scores (i.e., at or above 70th percentile) forcefully declare themselves "too much," compared with only 39.5% of the senior managers with Excitable scores below the 70th percentile. This observation confirms the fact that co-workers view highly Excitable managers as too forceful in their leadership.

Figure 3.3

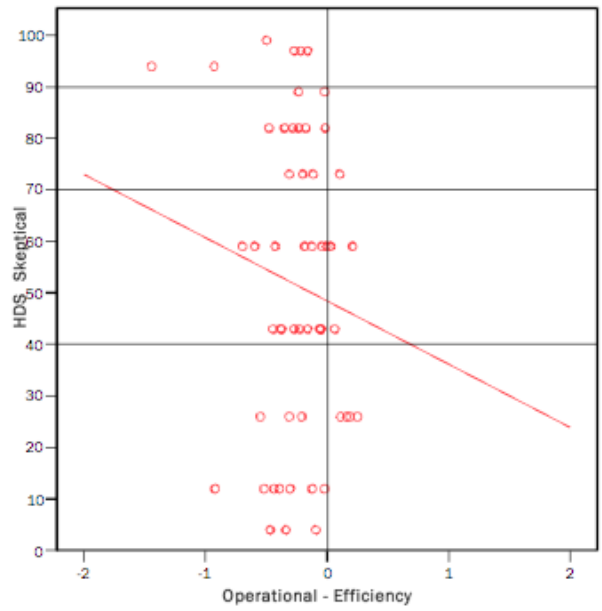
HDS Excitable Scale Plotted Against the LVI Forceful Declares Leadership Ratings




*Skeptical.* The Skeptical scale concerns being defensive, suspicious, sensitive to criticism, and prone to fault-finding. This scale correlates negatively (r = -.18) with the Operational Efficiency dimension of the LVI, measuring resource conservation, goal selection, and awareness of group capacity. The graph displayed in Figure 3.4 displays the scores for our sample of 54 senior managers on both dimensions.

Figure 3.4

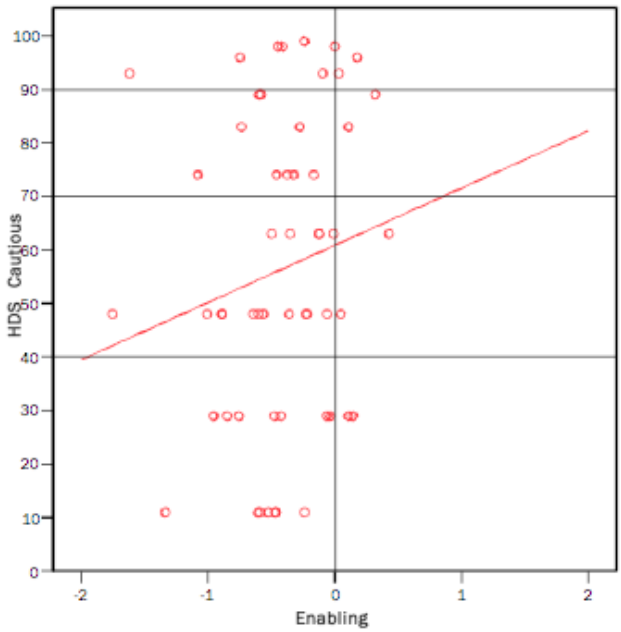
HDS Skeptical Scale Plotted Against the LVI Operational Efficiency Leadership Ratings



As Figure 3.4 illustrates, highly skeptical managers tend to "underdo" behaviors associated with efficient operational leadership. Specifically, 94.4% of senior managers with elevated Skeptical scores under-engage in these behaviors, compared with only 80.6% of those with Skeptical scores below the 70th percentile. It is likely that these managers, cynical and ever-watchful for signs of perceived mistreatment, are limited in their ability to seek efficiencies in the workplace.

*Cautious.* As previously described, the Cautious scale concerns being slow to make decisions, resistant to change, conservative, and a reluctance to take chances. This scale correlates positively (r = .15) with the Enabling dimension of the LVI, measuring the extent to which the manager supports and empowers others to become influential and contribute. The graph displayed in Figure 3.5 displays the scores for our sample of 54 senior managers on both dimensions.

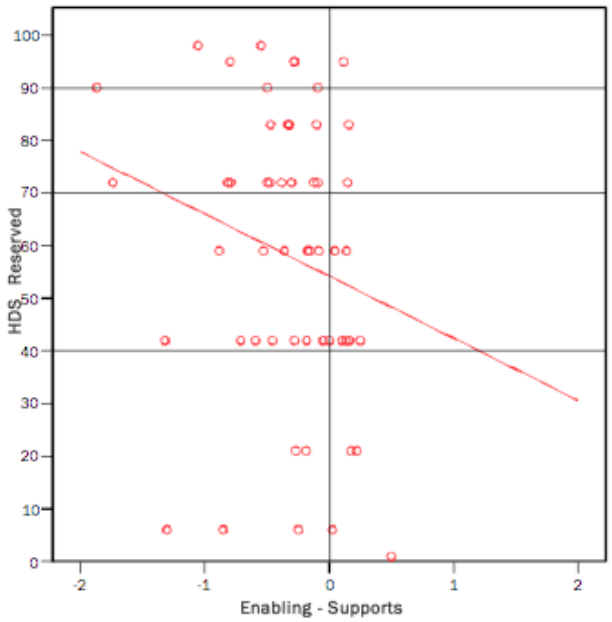
Figure 3.5
HDS Cautious Scale Plotted Against the LVI Enabling Leadership Ratings




As Figure 3.5 illustrates, most managers with elevated Cautious scores (80%), as well as those scoring below the 70th percentile (88.2%) tend to "underdo" behaviors associated with enabling leadership. However, these findings become much more enlightening considering the "too much" side of the Enabling scale. Specifically, 20% of the senior managers with elevated Cautious scores over-enable those around them, compared with only 11.8% of those with Cautious scores below the 70th percentile. In line with the characteristics associated with elevated Cautious scores, these managers tend to support and empower their subordinates to the extent that they delegate their own decisions onto them. Undoubtedly, these behaviors serve as defense mechanisms against criticism, since the manager may blame failures on those he/she empowered previously to make their decisions for them.

*Reserved.* The Reserved scale concerns being insensitive, uncomfortable around others, uncommunicative, and deficient in providing feedback. This scale correlates negatively (r = -.23) with the Enabling Supports dimension of the LVI, measuring sensitivity towards others' feelings, treating people well, and showing appreciation. The graph displayed in Figure 3.6 displays the scores for our sample of 54 senior managers on both dimensions.

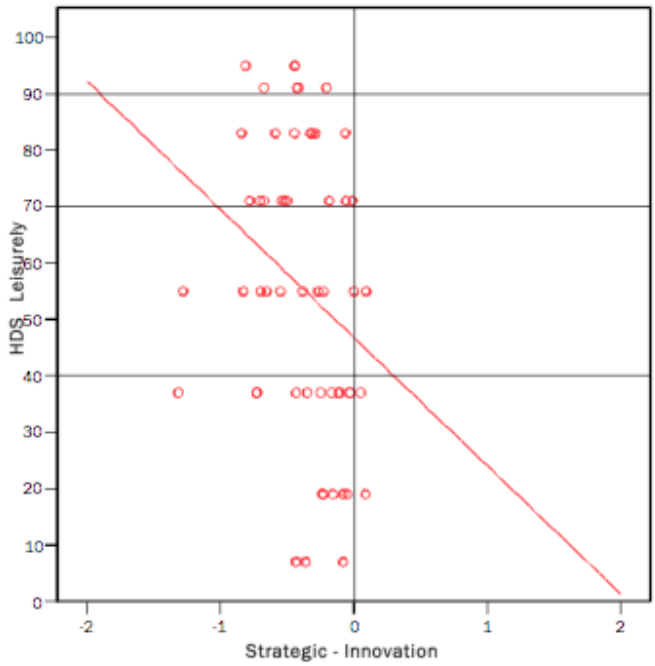
Figure 3.6
HDS Reserved Scale Plotted Against the LVI Enabling Supports Leadership Ratings




As might be expected, co-workers rated highly reserved managers as deficient in enabling, supportive behavior. Figure 3.6 shows that 88% of senior managers with elevated Reserved scores under-support their co-workers, compared with only 65.5% of those with Reserved scores below the 70th percentile. In contrast, 34.5% of managers with Reserved scores below the 70th percentile "overdo" these supportive behaviors, compared with only 12% of those with elevated Reserved scores. These findings confirm the predictions that uncommunicative managers who prefer working alone will provide insufficient support for the needs of their co-workers and will fail to be empathic and show encouragement to others.

*Leisurely.* As detailed earlier, the Leisurely scale concerns being unwilling to confront others, hard to coach, stubborn, and passive-aggressive. This scale correlates negatively (r = -.26) with the Strategic Innovation dimension of the LVI, measuring the extent to which the manager questions the status quo and encourages new and creative ideas. The graph displayed in Figure 3.7 displays the scores for our sample of 54 senior managers on both dimensions.

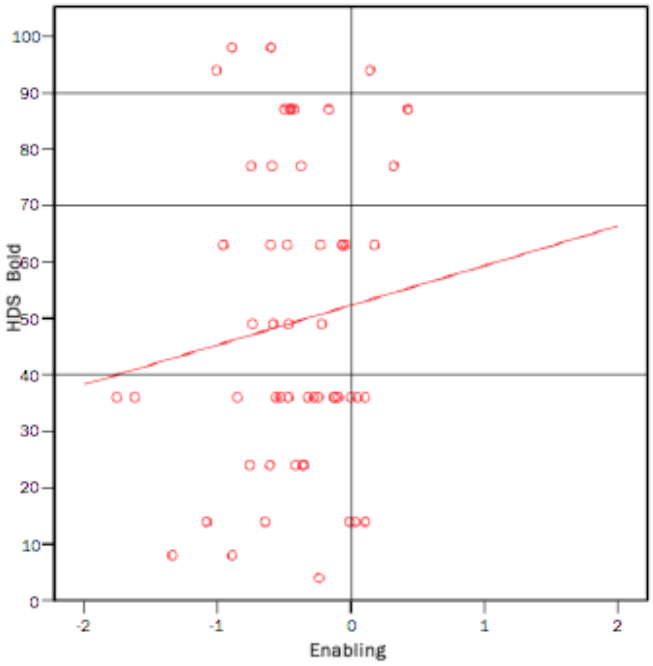
Figure 3.7
HDS Leisurely Scale Plotted Against the LVI Strategic Innovation Leadership Ratings




Interestingly, Figure 3.7 shows that *none* of the senior managers with elevated Leisurely scores over-engaged in strategic innovation, compared with 9.7% of those scoring below the 70th percentile. Put another way, co-workers of managers with elevated Leisurely scores *always* indicated that the manager did not sufficiently challenge the status quo, embrace change, nor encourage new and creative ideas. Again, this finding supports the idea that managers who find confrontation difficult also will find it difficult to challenge established ideas and foster innovation.

*Bold.* The Bold scale concerns being assertive, energetic, confident, and visionary. This scale correlates positively (r = .10) with the Enabling dimension of the LVI, measuring the extent to which the manager supports and empowers others to become influential and contribute. The graph displayed in Figure 3.8 displays the scores for our sample of 54 senior managers on both dimensions.

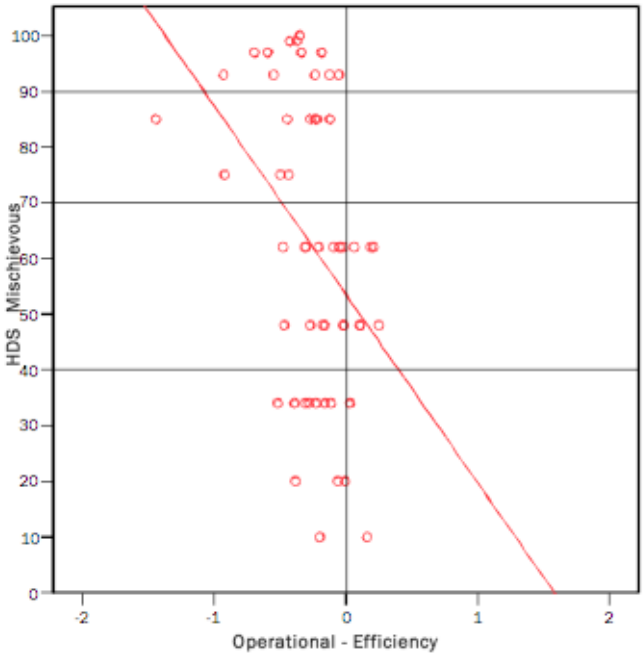
Figure 3.8
HDS Bold Scale Plotted Against the LVI Enabling Leadership Ratings




As Figure 3.8 illustrates, highly bold managers tend to "overdo" behaviors associated with enabling leadership. Specifically, 21.4% of the senior managers with elevated Bold scores over-enable those around them, compared with only 12.5% of those with Bold scores below the 70th percentile. These findings fit with the characteristics associated with elevated Bold scores, with these managers being confident, socially skilled, assertive, and unafraid of failure. As such, these managers may support, include, and enable co-workers "too much," challenging them to be influential and contribute beyond their level of comfort. In addition, they will take more credit than due for their co-workers' successes.

*Mischievous.* Recall from our previous discussion that the Mischievous scale concerns being risky, limit-testing, impulsive, and easily bored. As might be expected, this scale correlates negatively (r = -.38) with the Operational Efficiency dimension of the LVI, measuring resource conservation, goal selection, and awareness of group capacity. The graph displayed in Figure 3.9 displays the scores for our sample of 54 senior managers on both dimensions.

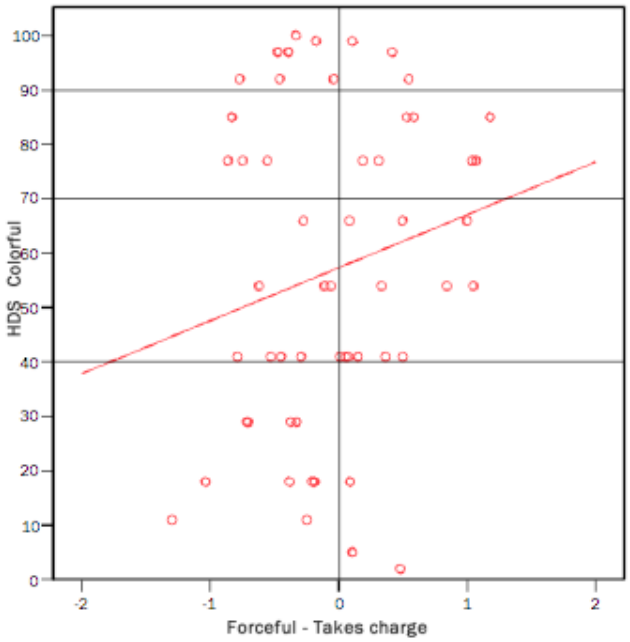
Figure 3.9
HDS Mischievous Scale Plotted Against the LVI Operational Efficiency Leadership Ratings




As Figure 3.9 shows, *none* of the senior managers with elevated Mischievous scores are rated as being "too" efficient, compared with 24.2% of those scoring below the 70th percentile. As such, co-workers of intuitive, adventurous, and risky managers *always* indicated that the manager did not sufficiently contain costs or consider group bandwidth. Again, this finding supports the idea that managers who enjoy pouring resources into risky, new, and exciting projects will find it difficult to focus on conserving those same resources in smaller, incremental efforts.

*Colorful.* The Colorful scale concerns being attention-seeking, dramatic, self-promoting, and making a strong first impression. This scale correlates positively (r = .14) with the Forceful Takes Charge dimension of the LVI, or assuming authority, showing initiative, and setting clear expectations. The graph displayed in Figure 3.10 displays the scores for our sample of 54 senior managers on both dimensions.

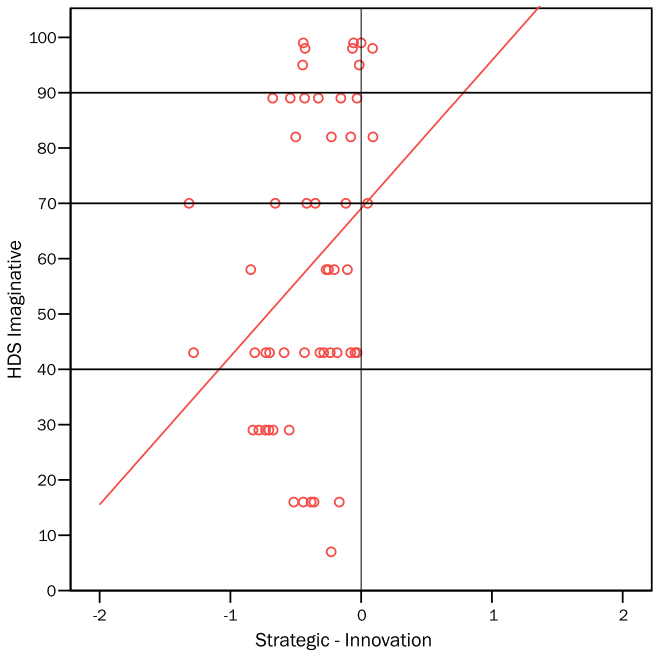
Figure 3.10
HDS Colorful Scale Plotted Against the LVI Forceful Takes Charge Leadership Ratings




As Figure 3.10 illustrates, highly colorful managers tend to take charge "too much" as part of their forceful leadership. Specifically, 47.6% of the senior managers with elevated Colorful scores assume authority and step in to solve co-workers' problems "too much," compared with a lesser 45.5% of those with Colorful scores below the 70th percentile. In line with the characteristics associated with elevated Colorful scores, these managers tend to take charge of situations and show initiative to serve their needs to manage by crisis, promote themselves, and gain attention.

*Imaginative.* As previously described, the Imaginative scale concerns being clever, imaginative, unconventional, and unpredictable. This scale correlates positively (r = .32) with the Strategic Innovation dimension of the LVI, measuring the extent to which the manager questions the status quo and encourages new and creative ideas. The graph displayed in Figure 3.11 displays the scores for our sample of 54 senior managers on both dimensions.

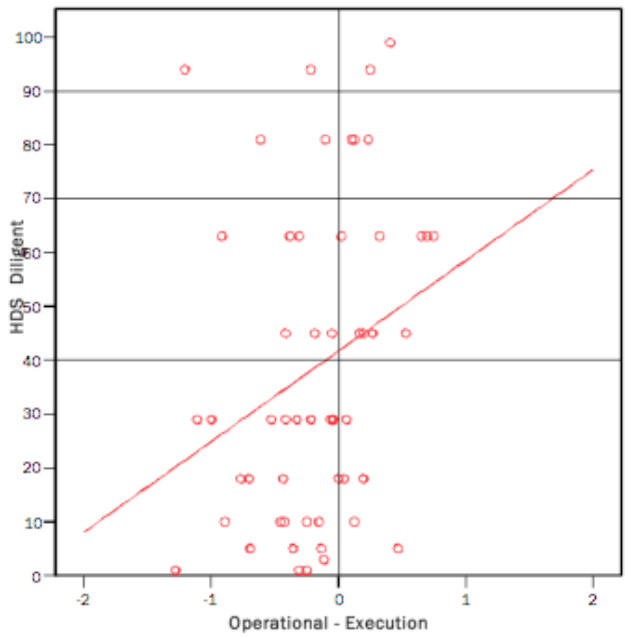
Figure 3.11
HDS Imaginative Scale Plotted Against the LVI Strategic Innovation Leadership Ratings




As figure 3.11 illustrates, highly imaginative managers tend to "overdo" behaviors associated with strategic innovation. Specifically, 12.5% of the senior managers with elevated Imaginative scores embrace change and encourage innovation "too much," compared with *none* of the managers with Imaginative scores below the 70th percentile. As might be expected in hindsight, clever and imaginative managers may push "too much" for innovative ideas, where more steady and practical managers may not challenge the status quo enough, "under-doing" behaviors associated with strategic innovation.

*Diligent.* The Diligent scale concerns being conscientious, hard-working, well-organized, and good with details. This scale correlates positively (r = .29) with the Operational Execution dimension of the LVI, measuring implementation, detail-orientation, and tactical drive for results. The graph displayed in Figure 3.12 displays the scores for our sample of 54 senior managers on both dimensions.

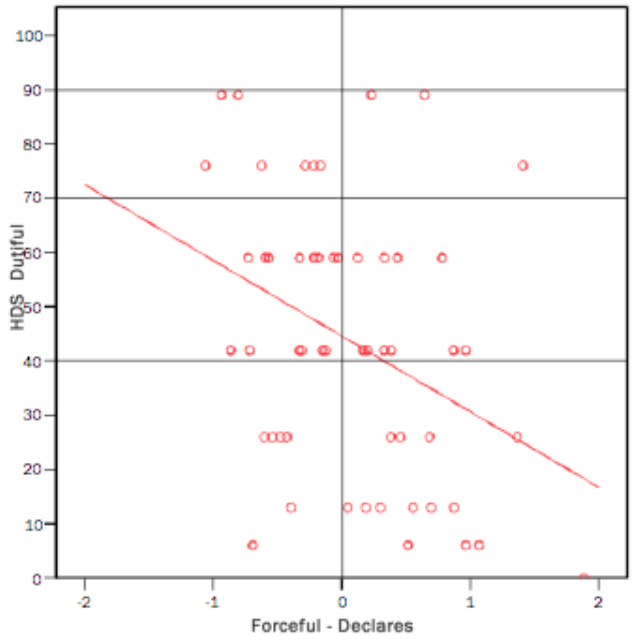
Figure 3.12
HDS Diligent Scale Plotted Against the LVI Operational Execution Leadership Ratings




As Figure 3.12 illustrates, highly diligent managers tend to "overdo" behaviors associated with operational execution. Specifically, 55.6% of senior managers with elevated Diligent scores over-engage in these behaviors, compared with only 31.1% of those with Diligent scores below the 70th percentile. It is likely that these managers, being perfectionistic and nit-picky, become bogged down in the day-to-day details of implementation and involve themselves in these details "too much." In contrast, managers with low Diligent scores, being undemanding and relaxed about rules, may "underdo" these same behaviors, delegating tactical leadership responsibilities instead of becoming appropriately involved themselves.

*Dutiful.* As detailed earlier, the Dutiful scale concerns being cooperative, agreeable, polite, and eager to please. This scale correlates negatively (r = -.41) with the Forceful Declares dimension of the LVI, measuring decisive action, use of command skills, and not backing down easily. The graph displayed in Figure 3.13 displays the scores for our sample of 54 senior managers on both dimensions.

Figure 3.13
HDS Dutiful Scale Plotted Against the LVI Forceful Declares Leadership Ratings




As seen in Figure 3.13, highly dutiful managers tend to "underdo" behaviors associated with forceful declarative leadership. Specifically, 70% of the senior managers with elevated Dutiful scores forcefully declare themselves "too little," compared with only 45.5% of managers with Dutiful scores below the 70th percentile. In contrast, only 30% of the senior managers with elevated Dutiful scores forcefully declare themselves "too much," compared with 54.5% of those with Dutiful scores below the 70th percentile. These findings confirm the assertions that obliging and unassuming managers will face difficulties in taking an unpopular leadership position and defending it. However, managers with low Dutiful scores, being independent and tough-minded, will more readily engage in these behaviors, even using them "too much."

### 3.5.3 Summary

Fifty-four senior managers completed the HDS and were rated by their co-workers on the dimensions comprising the Leadership Versatility Index. These results illustrate the utility of the HDS for identifying where elevations in certain personality characteristics may translate into leadership behavioral deficiencies or excesses. In all 11 cases, the use of the HDS could have predicted the over- or under-engagement in behaviors associated with Forceful/Enabling or Strategic/Operational leadership. Considering the impact of management on tangible and intangible outcomes, these results represent a significant return on investment (ROI) for organizations where effective and balanced management is critical for successful performance.

# 4. Interpretation and Uses

## 4.1 Introduction

The HDS provides information on the likelihood that certain dysfunctional patterns of behavior will emerge in work settings. Research shows that people with lower scores on the HDS scales have fewer problems at work than those with higher scores. Consistent with socioanalytic theory, the HDS assesses dysfunctional dispositions that can impede a person's efforts to "get along" and "get ahead." Maladaptive behaviors may emerge in certain interpersonal contexts (team interactions, relationships with subordinates or supervisors, etc.) or in certain circumstances (e.g., work pressure, fatigue, uncertainty, or lack of social vigilance). In general, higher scores on any HDS scale indicate that the person is more likely to engage in maladaptive behavior.

This chapter provides some suggestions and examples regarding how to interpret the HDS scales and selected scale configurations. This information is valuable in at least two ways. First, knowing about potential dysfunctional dispositions can be useful for employee selection, advancement, and succession planning. Second, employees at all levels can use this information for their own development and to minimize the risk of derailment. It is important to remember that virtually anyone can improve aspects of his or her social performance. The HDS provides an efficient and reliable way to highlight potential performance challenges so that one can learn how to manage them more effectively. For each scale, we provide brief suggestions for dealing in a positive way with the challenges associated with moderately high or high scores. Detailed suggestions can be found in *The Hogan Guide: Interpretation and Use of Hogan Inventories* (R. Hogan, Hogan, & Warrenfeltz, 2007), available at www.hoganassessments.com.

As we noted in Chapter 1, dysfunctional behaviors typically reflect the influence of underlying cognitive schemas (i.e., developmentally based patterns of interpreting information and making sense of one's own and others' behavior). The world of social interaction is too complex and uncertain for anyone to comprehend fully the meaning of every experience. Scientists develop theories to break up the natural world into manageable units for analysis and understanding; these theories tell scientists what to look for and how to make sense of their data. Our schemas are our personal theories of experience—they are the "filters" through which experience is organized. Like theories in science, schemas determine what is perceived, how perceptions are interpreted, and the response most appropriate for the situation as perceived. Thus, when the sky darkens and the wind picks up on a humid summer day, we infer that a thunderstorm may be coming. Our "weather schema" leads to a prediction and a behavioral response (taking an umbrella) that may or may not be correct.

"Relational schemas" organize our experiences with other people, allow us to infer the causes of their behavior and to predict their future reactions toward us. Interpersonally effective people have developed schematic representations of experience that lead to reasonably accurate perceptions of their own capabilities and realistic predictions regarding the behavior and motivations of others. But like our "weather schema," inferences based on our relational schema may be mistaken. For example, by attending to the wrong cues and misinterpreting motives, we might assume that a person to whom we are romantically attracted shares those feelings. Our subsequent behavior is shaped by our erroneous assumptions, and nearly everyone has made mistakes

in that domain. Afterwards, confident people may simply smile, assume that they will have "better luck next time," and start a conversation with another person who seems intriguing. In contrast, people with a "negative self-schema" may conclude that they are unlikeable clods and retreat to the corner to simply observe. The situation is the same—it is the schema that affects how people will react emotionally, the inferences that they draw about potential romantic success in the future, and the resulting behavior. Although the behavior may be "dysfunctional" in an objective sense, it is nonetheless based on a false schematic representation of an event, and it is typically self-protective or self-promoting—thus schemas tend to be self-perpetuating and resistant to change.

Schemas typically originate in childhood experiences and function outside immediate awareness in adulthood. Children base their conclusions on experience; regrettably, their conclusions are often incorrect. Consider, for example, a boy whose parents criticize him randomly and severely. This child may conclude that he is defective in some way. Further, he may never learn to cope with parental criticism and rejection. He may develop a relational schema that leads him to be vigilant for what he perceives as inevitable (and perhaps even justifiable) criticism or rejection from others, and he will try to avoid such criticism as much as possible. He may perceive criticism where it doesn't exist and, because people discount or ignore experience that is inconsistent with their schemas, the boy may not notice expressions of affirmation or respect from others. Obvious successes may be attributed to "good luck." Behaviorally, the boy will be shy, timid, and afraid of new experiences—tendencies that will become more pronounced when he is stressed.

As we suggested earlier, no one had a perfect childhood. Although some people have worse childhoods than others, early life experiences—with family members, peers, teachers, the media, etc.—are inevitably stressful to a greater or lesser degree. Stressful experiences form the basis for dysfunctional or unrealistic schemas, and we tend to bring these schemas into our adult relationships. The dysfunctional dispositions assessed by the HDS reflect behaviors based on specific underlying schemas about work and relationships with other people. Awareness of such schemas and the associated behaviors allows us to predict a person's likely responses in various work contexts. It also points to potentially fruitful targets for ongoing professional development.

Finally, it is important to note that effective social interaction requires balance, versatility, and the capacity to adapt appropriately to a given interpersonal context. For this reason, we believe that very low scores on most HDS scales can also indicate potential development opportunities. Although the behavioral implications of low scores are typically not as obvious as the manifestations of higher scores, they too may reflect behaviors that can impede occupational success. As a result, the interpretive guidelines below highlight possible negative implications of low scores for a variety of work contexts.

## 4.2 Scale-by-Scale Interpretation

Characteristics associated with different scale elevations for each of the 11 HDS scales are described below. Most of these interpretive statements were derived from descriptions provided by coworkers as well as demonstrated relationships between each scale and respondents' scores on other personality measures (see chapter 3). We also provide brief descriptions of the relational schemas associated with higher scores on each

scale and developmental suggestions for persons scoring in the "moderately high" or "high" range of the scale. Naturally, these developmental recommendations must be tailored to the specific needs of the individual and will be most effective when implemented in consultation with a trusted mentor or coach.

Scores on the HDS scales indicate the percentile in which the person's "raw score" falls relative to the normative sample (see Chapter 2). For interpreting the meaning of each HDS scale score, we suggest the following percentile ranges:

- Low: 0% - 39%
- Moderately Low: 40% to 69%
- Moderately High: 70% - 89%
- High: 90% - 100%

Again, higher scores on any HDS scale do not indicate that the dysfunctional behaviors associated with that score will occur consistently. Rather, higher scores indicate a greater likelihood that the behavior will emerge under stressful conditions. These are the behaviors which, when not managed effectively, can impair or even derail an individual's performance or advancement in the workplace.

### 4.2.1 Excitable

The Excitable scale concerns a tendency toward unmodulated emotional responding and a readiness to feel disappointed by projects, people, or organizations. After a period of initial enthusiasm, high scorers characteristically become frustrated by letdowns or roadblocks and then tend to abandon the project or relationship. High scorers are often aimless and dispirited in their career decisions, and they change jobs more frequently than other people. Expecting to be disappointed, they use emotional displays as a means to be noticed, to impact the environment, and to stay distant from others.

*Scale Elevations.* People scoring at different levels on the Excitable scale are typically described as follows:

Low:

- calm, steady, and stable in relationships with subordinates, colleagues, and supervisors
- typically in a good mood and unlikely to become overly excited or emotional in stressful situations
- able to endure frustrations and setbacks without giving up on projects and people
- unlikely to show much enthusiasm for new ideas or opportunities, sometimes making it difficult to motivate others effectively
- satisfied with career choices and willing to give both people and projects the "benefit of the doubt"

Moderately Low:

- sufficiently emotional to seem both enthusiastic and frustrated
- unlikely to become overtly angry

- able to maintain mutually respectful working relationships
- persistent in completing difficult or frustrating projects or assignments
- composed and steady in response to crises or emergencies

Moderately High:

- energetic and active, but also moody and irritable
- easily frustrated and annoyed with those who seem disrespectful or critical
- emotionally unpredictable
- easily disappointed; quick to doubt projects or people that don't proceed or react as expected
- generally sympathetic to the problems of others and capable of responding empathically

High:

- intense and energetic, but also unpredictable, volatile, and sometimes explosive
- sensitive to criticism and quick to feel disrespected when challenged or criticized
- ready to abandon projects or relationships that do not proceed as expected
- unfulfilled by life, work, and relationships
- exploding in frequent emotional displays that tend to alienate subordinates and colleagues

*Underlying Schema.* High scorers on the Excitable scale typically report an early family environment that was unpredictable and emotionally volatile. Behaviors that were praised one day might be punished the next, leading them to be doubtful and confused about parental expectations. Feelings and opinions were often negated or discounted, leading to difficulty in establishing a cohesive identity. As we indicated in Chapter 3, high Excitable individuals face an "approach-avoidance" conflict: they want acceptance but expect rejection. The fear becomes a self-fulfilling prophecy. Because they expect that others will exploit or disappoint them, they are vigilant for signs of disparagement. They are ready to strike out emotionally and reject those who may disappoint them or let them down. Their displays of negative emotion serve three functions: they attract attention and allow an illusion of control and power, but they keep others at a distance where they are ultimately less threatening.

*Developmental Recommendations.* High Excitable people will tend to see developmental feedback as criticism or rejection. Consistent with the underlying schema, they may respond with self-protective displays of emotion. Feedback will be most successful when it is offered calmly and compassionately. Effective feedback will offer clear expectations for performance and set boundaries for what is and is not acceptable in the workplace. High Excitable individuals should be encouraged to:

1. Recognize their tendency to see disagreement as criticism or exploitation, take time to reflect, and request additional information to avoid overreacting or withdrawing from the interaction.
2. Communicate consistently to ensure that their standards and expectations are understood by others.

3. Try to seem relaxed and optimistic during stressful times, as this will communicate to staff and colleagues that perseverance will ultimately pay off.
4. Avoid becoming overly optimistic about new projects or people; this will reduce the likelihood of discouragement down the line.
5. Remember that emotional outbursts will upset staff, reduce their productivity and negatively affect their performance.

### 4.2.2 Skeptical

The Skeptical scale concerns the tendency to mistrust others' motives and doubt their intentions, to be alert for signs that one is being deceived or mistreated, and to take action to defend oneself against mistreatment. Although high Skeptical people are shrewd and difficult to fool, others may find them hard to work with because they take criticism personally, feel misused, tend to be suspicious, and are prone to retaliate when they feel they have been wronged.

*Scale Elevations.* People scoring at different elevations of the Skeptical scale are typically described as:

Low:

- optimistic, positive, and trusting
- confident that others will treat them fairly
- willing to "let bygones be bygones" without holding grudges
- so eager to find the good in others that real interpersonal conflict may be overlooked
- potentially naïve about organizational politics

Moderately Low:

- open and cooperative
- able to accept criticism nondefensively
- willing to take other people's actions at face value
- eager to work with others
- easy to coach

Moderately High:

- insightful about others' motives and about organizational politics
- uncooperative when asked to do something without sufficient justification
- argumentative
- doubtful that others will be trustworthy
- defensive in response to criticism or coaching

High:

- cynical and mistrustful of others' motives and intentions
- easily offended and often dramatic or argumentative
- quick to perceive others as attempting to mistreat or exploit them
- having a "chip on their shoulder"
- willing to hold grudges, bend the rules, and retaliate for perceived mistreatment

*Underlying Schema.* Individuals scoring high on the Skeptical scale view the world as a hostile and dishonest place. They view others as malevolent and believe that they must remain vigilant for signs that others will exploit them. Most high Skeptical individuals grew up in an environment that was degrading, controlling, or dishonest. Self-sufficiency, autonomy, and mistrust of others had "survival value" in that environment; unfortunately, the evolving schema lessens the likelihood that the individual will seek evidence of respect and affirmation. Expecting mistreatment, high Skeptical individuals are quick to find it. In such situations, they may recoil in an angry or combative manner to gain control or to distance themselves from others. In the workplace, high Skeptical employees are sensitive to organizational politics. However, they are intolerant, distrust those in charge, and fear that colleagues or subordinates will attempt to circumvent their own authority. These beliefs create a contentious interpersonal style marked by irritability, grudges, and hypersensitivity to criticism. High Skeptical individuals are most effective when given independent roles and managed with limited supervision.

*Developmental Recommendations.* High Skeptical individuals will, of course, doubt the sincerity and motives of those who seek to offer constructive developmental feedback. Candor and transparency are particularly important so that the individual can develop the trust required for effective intervention. High Skeptical employees benefit from feedback that encourages greater balance in perceptions of others and a willingness to consider multiple motives for others' behavior. High Skeptical individuals can be encouraged to:

1. Become more aware of their tendency to separate the world into "heroes" and "villains," with most assigned to the latter group.
2. Question the assumption that others deliberately attempt to demean, frustrate, or exploit them.
3. Risk confiding in others at work to falsify the assumption that colleagues will use such personal information against them.
4. Learn skills other than hostility and combativeness to address situations in which they were, in fact, misunderstood or criticized inappropriately.
5. Experiment with acting in a more friendly or engaging manner.

### 4.2.3 Cautious

The Cautious scale concerns the tendency to be careful, conservative, worried about making mistakes, and reluctant to take initiative for fear of being criticized or embarrassed. Although high scorers are usually good corporate citizens, others may find them hard to work with because of their need to "stay within the lines" and their reluctance to innovate, try new procedures, or speak out in meetings.

*Scale Elevations.* People scoring at different levels on the Cautious scale are typically described as follows:

Low:

- decisive, adventurous, and unafraid to make mistakes
- open to innovation and willing to accept new challenges
- relaxed around strangers
- sometimes insensitive to how they impact others
- reluctant to listen to feedback regarding their ideas or job performance

Moderately Low:

- upbeat, emotionally poised, and stable
- willing to try new methods and technologies
- able to handle disappointment in a mature manner
- willing to take a stand and make decisions rapidly
- self-confident and able to meet the public well

Moderately High:

- slow to act and careful to make well considered, low-risk decisions
- worried about their own and their staff's mistakes
- reluctant to take on challenging assignments
- unassertive with new people and uncomfortable speaking in front of groups
- reluctant to try new methods and resistant to changes in policies and procedures

High:

- indecisive, self-conscious, fretful, and alert for signs of displeasure from others
- reluctant to take controversial positions or make decisions, seeking excessive amounts of data or input before making a decision
- slow to adopt new procedures out of fear of making mistakes and getting in trouble with authority
- reluctant to undertake challenging tasks
- overly sensitive to criticism, feedback, or coaching

*Underlying Schema.* High Cautious individuals fear criticism and embarrassment. They typically grew up in families where they were criticized and offered inconsistent criteria for affection and approval. As a result, high Cautious individuals see criticism or negative feedback as reflecting on their overall value as a person. The parents were often overprotective, preventing the child from developing confidence in his or her ability to confront the unknown or unexpected. Fearing that they are defective in some way, they seek to avoid giving other people the opportunity to see their deficiencies. They are so sensitive to criticism that they even discount positive feedback, e.g., "I was just lucky this time" or "he's just being nice because he knows that it's only a matter of time before I completely mess up." No one enjoys criticism, but high scorers on the Cautious scale are unusually sensitive to it; as a result, they seek to avoid unpredictable events and potentially risky decisions as much as possible.

*Developmental Recommendations.* Like those scoring high on the Excitable scale, high Cautious individuals will tend to experience even constructive feedback as reflecting disapproval or rejection. Unlike high Excitable people, who are likely to react overtly to bad news, high Cautious people typically internalize their negative feelings. In the context of direct but supportive feedback, high Cautious people are most likely to respond to interventions that encourage them to:

1. Take risks in social behavior, and understand that although they may feel awkward or foolish, others are not likely to view them that way.
2. Challenge the belief that mistakes signify failure and inadequacy, and see them instead as opportunities to learn and to improve.

3. Recognize that when others ask for their opinion, it is usually because others believe they have something important to say.
4. Seek out trusted colleagues for input on decisions, while the coach, mentor, or superior gives positive feedback for making timely decisions, even if they are wrong.
5. Ask others for feedback regarding their contributions to decision making and team functioning.

### 4.2.4 Reserved

The Reserved scale concerns the tendency to keep to oneself, to dislike working in teams or meeting new people, and to be indifferent to the moods and feelings of others. Although persons with high scores work well alone, others may find them difficult because they tend to be withdrawn and uncommunicative, they rarely give feedback to others, and they tend not to be very insightful or perceptive about social cues or office politics. Imperceptive and gauche, they are unrewarding to deal with.

*Scale Elevations.* People scoring at different levels of the Reserved scale are typically described as:

Low:

- outgoing, friendly, kind, and understanding
- communicating effectively and meeting strangers well
- eager to support others in times of crisis or frustration
- averse to tasks that require solitary effort
- more focused on helping others than they are on their primary responsibilities or obligations

Moderately Low:

- socially approachable, interpersonally perceptive, and concerned about others
- considerate of others' feelings and willing to ask questions in order to understand
- good "team players"
- effective in working with the public
- eager to build good relationships among colleagues, subordinates, and staff

Moderately High:

- uncomfortable around strangers
- blunt and straightforward in social interaction
- uninvolved with others and indifferent to their problems, leaving them unclear where they stand
- comfortable with pressure and able to handle conflict and criticism better than most
- withdrawn and noncommunicative in group or team settings, preferring instead to work alone

High:

- tough, direct, and independent
- unconcerned with the impression they make on others, often appearing intimidating

- insensitive to the needs and feelings of others
- unlikely to show public support for colleagues and subordinates
- unable to build effective coalitions or motivate others successfully

*Underlying Schema.* Although they may also be natural introverts, persons scoring high on the Reserved scale lack social sensitivity, and they experience social interaction as unpleasant. Early experiences were marked by social isolation, inadequate nurturing, and an expectation of self-sufficiency. Caregivers offered little empathy, preventing development of the capacity to notice and respond effectively to the needs and feelings of others. The high Reserved individual therefore sees little value in social or emotional connectedness, believing that life is best lived on a rational basis. The absence of socialization experiences left the high Reserved person socially clumsy, blunt, and tactless, with little awareness of the impact of his or her behavior on others. At work, high Reserved employees are impervious to both praise and criticism and rarely offer such feedback to others. They value appearing tough and resilient. They contribute little to discussions or group problem-solving efforts. The high Reserved employee believes that he or she is most effective when left alone and allowed to work in isolation.

*Developmental Recommendations.* Tough and independent, the high Reserved individual will experience feedback as an intrusion on his or her "personal space." Recommendations will be most effective when presented directly, honestly, and as strategies for maximizing the employee's contribution to the organization. High Reserved individuals are most likely to respond to interventions that encourage them to:

1. Observe others' emotions and practice discriminating between expressions of positive and negative feeling.
2. Accept that feelings are important to most people and that other people can be injured easily; thus, watch others' reactions to learn what is hurtful and what is experienced as supportive.
3. After meetings or other social encounters, check with others to gauge the overall "message" that was communicated.
4. Respect that the tendency to be blunt and direct in communication can impede success in building consensus in team-based projects.
5. Despite the preference for being alone, make conscious efforts to interact daily with colleagues, supervisors, and subordinates.

### 4.2.5 Leisurely

The Leisurely scale concerns the tendency to insist on working according to one's own timetable and standards of performance, to resist being hurried or coached by others, to become resentful and irritated when asked to increase the speed or quality of one's performance, but to mask the resentment well. Although persons with high scores on this scale can be outwardly pleasant and sociable, others may find them hard to work with because of their procrastination, tardiness, stubbornness, and reluctance to be part of a team. They may set their staff up for failure by not setting clear expectations, then criticizing them for not delivering effectively.

*Scale Elevations.* People scoring at different levels on the Leisurely scale are typically described as:

Low:

- helpful, positive, cooperative, and responsive to feedback and coaching
- flexible in response to changing expectations and performance demands
- easily distracted by interruptions, new ideas, and social interactions
- reluctant to express opinions and ideas on issues or problems
- skilled at meeting deadlines and following through on commitments

Moderately Low:

- cheerful and optimistic
- willing to express negative but constructive opinions regarding people, projects, and opportunities
- helpful to colleagues faced with deadlines, a heavy workload, or personal stress
- supportive of corporate and organizational policies
- committed to working constructively with others toward common goals

Moderately High:

- socially skilled and capable of making a positive first impression on others
- overtly cooperative but quick to feel mistreated or exploited by those in positions of authority
- effective at concealing feelings and opinions from others
- irritable when interrupted or given additional assignments on top of an already heavy workload
- procrastinating, especially when completing tasks for people who are disliked or not respected

High:

- overvaluing independence to the point of covertly resisting requests from others
- unwilling to state clear expectations for subordinates' performance
- stubborn to the point of not following through on commitments
- quick to feel exploited and immune to constructive criticism and complaints
- covertly critical of top management and others in positions of authority

*Underlying Schema.* In their earliest years, persons scoring high on the Leisurely scale enjoyed attentive nurturing and warmth. Usually this was withdrawn abruptly (e.g., upon the birth of a sibling) and replaced by demands for high performance. Expressions of annoyance or frustration were not allowed. These experiences created a schema through which authority figures are viewed as incompetent or unfair. In reaction, the high Leisurely individual believes in the right to pursue his or her own agenda on his or her own time. The high Leisurely employee envies and resents those who are successful but maintains self-respect and a sense of self-sufficiency by resisting expectations (through procrastination, failure to follow organizational policies, etc.). As this individual fears negative reaction to direct expressions of annoyance or frustration, he or she expresses such feelings indirectly (e.g., missing deadlines or claiming that a project is not part of the job description). Expecting exploitation, high Leisurely employees may be personally ambitious but will offer few substantive contributions to team projects. They prefer remaining isolated to avoid the risk of being controlled by others.

*Developmental Recommendations.* The high Leisurely employee will appear charming and receptive to developmental feedback. However, this self-presentation masks significant resentment that he or she should be asked to change. Citing specific examples of performance (including interpersonal interactions) that could be improved and offering recommendations as strategies to enhance his or her stature in the workplace may help the high Leisurely individual accept feedback constructively. Specifically, high Leisurely employees can be encouraged to:

1. Risk direct (but appropriate) statements of frustration or annoyance when feeling overwhelmed or challenged.
2. Consider the possibilities that others have achieved positions of authority because they are, in fact, competent and that conforming to expectations is not a threat to self-sufficiency.
3. Build the trust of others by requesting their opinions and by assisting them as much as possible.
4. Generate explicit timelines for completing tasks, making a commitment to follow these self-generated expectations.
5. Limit the promises made to others but ensure that these commitments are fulfilled as promised.

### 4.2.6 Bold

The Bold scale concerns the tendency to overestimate one's talents and accomplishments, ignore shortcomings, blame mistakes on others, and have unrealistic career goals and a strong sense of entitlement. Although high scorers are often charismatic and make a strong first impression, others may find them hard to work with because they also tend to be demanding, opinionated, self-absorbed, and unable to learn from their mistakes.

*Scale Elevations.* People scoring at different elevations on the Bold scale are typically described as follows:

Low:

- easy-going, content, modest, and restrained
- willing to help others when asked
- unlikely to interrupt, challenge, or criticize others
- reluctant to volunteer for positions of leadership
- ready to accept responsibility for errors and mistakes

Moderately Low:

- quietly confident in their abilities as leaders and decision makers
- willing to acknowledge personal limitations while finding ways to work around them
- having a realistic view of their own competencies and willing to listen to feedback
- ready to express ideas and opinions when asked to do so
- respectful of others and tolerant of their shortcomings

Moderately High:

- confident, socially skilled, and unafraid of mistakes or rejection
- assertive in expressing ideas and opinions

- clear in their career goals and how best to achieve them
- willing to take initiative and assume a dominant role in team interactions
- self-promoting and slow to share credit for accomplishments

High:

- aggressively ambitious and fearless when facing difficult tasks, regardless of actual past performance
- impulsive and resistant to negative feedback
- unrealistic in evaluating their abilities and competencies, and willing to make decisions without seeking input from others
- feeling entitled to leadership positions and special consideration
- intimidating and insensitive in dealing with peers and subordinates, blaming them for all performance issues

*Underlying Schema.* Persons with high scores on the Bold scale believe that they are unique or exceptional in some way. This belief usually arises from adult caretakers providing the child continuous positive feedback. High Bold people were often the "golden child" of the family, lacking the boundaries and discipline necessary for learning their own and others' limits. Sometimes a history of exclusion, rejection, and/or illness can create a belief in one's exceptionality—because there must have been something special about the person to have had such experiences. Often their public self-confidence masks private self-doubt; however, these negative feelings may be so deeply buried that they are inaccessible. In either case, high Bold people perceive themselves as inherently different from others. This leads to the belief that they should not accept subordinate positions or tolerate menial or dull tasks. High Bold individuals often seem visionary, but their vision concerns their self-advancement rather than the welfare of others. They have a sense of purpose and a career direction, but they are insensitive to the impact of their behavior on others, whom they believe should be eager to support them in the pursuit of their private goals. Because making mistakes is inconsistent with the image of themselves as "superior," they typically blame them on others or rationalize them away.

*Developmental Recommendations.* High Bold individuals believe in their own superior talent and typically resist developmental feedback. To the degree that personal development is seen as a strategy for advancing their personal agendas, high Bold individuals can be encouraged to:

1. Lower their expectations for special treatment, and try to accept responsibility for their occasional mistakes.
2. Recognize that they ignore negative feedback, and seek feedback from family, and friends who are not competitors and whose feedback is usually well meaning.
3. Stop regarding team interactions as opportunities for competition in which only one person can "win"; remember that the real competition is outside the organization, not within it.
4. Realize that subordinates are most likely to be productive when they feel respected; learn how to offer positive feedback to others when they contribute.
5. Use their confidence, energy, and determination to motivate rather than intimidate others.

### 4.2.7 Mischievous

The Mischievous scale concerns the tendency to appear charming, friendly, and fun-loving, but also to seem impulsive, excitement-seeking, and non-conforming. High scorers usually make a favorable first impression, but others find them hard to work with because they tend to test limits, ignore commitments, and take risks that may be ill-advised. Although they may seem decisive, they can make bad decisions because they are often motivated by pleasure and do not fully evaluate the consequences of their choices.

*Scale Elevations.* People scoring at different elevations of the Mischievous scale are typically described as:

Low:

- careful, responsible, and socially appropriate
- respectful in communicating with others and willing to respect organizational rules and expectations
- often worried about past mistakes and the possible negative consequences of current decisions
- reluctant to take a stand on important issues
- so averse to risk that they avoid embracing new ideas or technologies

Moderately Low:

- dependable and self-disciplined
- responsible, self-controlled, reasonable, and trustworthy
- willing to respect the organizational hierarchy and communicate through appropriate channels
- deliberate in decision making, typically thinking through the likely consequences of various courses of action
- unlikely to take chances that they view as unnecessary

Moderately High:

- clever, charming, pleasure-seeking, and adventurous
- capable of making quick decisions, sometimes without adequately considering likely outcomes
- impulsive and willing to take risks
- unlikely to dwell on past mistakes
- impatient and easily bored

High:

- engaging, interesting, quick-witted, daring, and fun
- skilled at influencing others' perceptions to advance his or her personal agenda
- willing to circumvent company tradition and policy when these interfere with a chosen action
- unwilling to learn from mistakes, often blaming poor outcomes on other people or circumstances
- incapable of appreciating and respecting the needs and feelings of others

*Underlying Schema.* High Mischievous individuals believe that if they do not dominate others, others will dominate or exploit them. Raised in families inconsistent in both nurturance and control, high Mischievous employees are cynical about the motivations of others. They see life as a jungle, believing that only the strong and cunning survive. Because the early environment was often highly charged emotionally, they seek out the stimulation that accompanies risky actions and decision making. They believe their own autonomy justifies circumventing the rules that regulate the behavior of others. Tough and resilient, the high Mischievous person focuses on the present moment; he or she does not anticipate consequences or regret past mistakes. The high Mischievous employee typically lacks the energy and career focus necessary for meaningful advancement. At work, this employee can be spontaneous, charming, and eager to embrace challenging assignments. However, he or she will exploit weaknesses in others in order to advance. Finally, the high Mischievous employee will become bored with details, will not honor commitments made to those in authority, and will show little loyalty to others if a new opportunity for advancement appears.

*Developmental Recommendations*. High Mischievous individuals will be suspicious of developmental feedback, viewing it as an attempt to motivate adherence to meaningless rules and expectations. While the high Mischievous employee will be superficially charming and interested in feedback, he or she will covertly reject many of the ideas offered. Past errors or missteps will be blamed on others or rationalized away. As a result, it is important to be assertive in identifying areas of concern while highlighting the personal challenges inherent in developmental feedback. If a "working alliance" can be achieved, the high Mischievous employee can be encouraged to:

1. Slow down decision making to afford time for a realistic appraisal of the likely consequences of three or four different courses of action.
2. Recognize that career success depends on the support of others; as a result, consider strategies for building their loyalty and trust.
3. Demonstrate loyalty to others by following through on the commitments made to them.
4. Apologize to those who may have been hurt or disappointed by past actions—rather than trying to explain the situation away.
5. Leverage spontaneity and charm to become a good "team player" who seeks success for all members of the organization.

### 4.2.8 Colorful

The Colorful scale concerns the desire to be the center of attention, to be recognized and noticed by others. As a result, high Colorful individuals make dramatic entrances and exits, they are clever at calling attention to themselves, and they enjoy entertaining others. Although they are lively and engaging and typically make a good first impression, others may find them hard to work with because they are impulsive, distractible, and disorganized. They often perform well in sales positions.

*Scale Elevations*. People scoring at different elevations of the Colorful scale are typically described as:

Low:

- quiet, unassuming, self-restrained, and possibly shy

- comfortable attending to details while others handle the "big picture"
- doubtful of their capacity to make a positive first impression on others
- reluctant to meet customers, members of the public, or others they do not know well
- unenthusiastic and unexcited about new projects, technologies, and business opportunities

Moderately Low:

- unpretentious and socially appropriate, avoiding self-promotion and preferring to let actions speak for themselves
- supportive of the performance of others
- deferential to those in positions of authority
- skilled at participating effectively in teamwork and other group projects
- reluctant to engage in self-promotion, sometimes to the point of advancing slower in the organization than would be justified on the basis of talent

Moderately High:

- clever, interesting, expressive, and "leader-like"
- socially assertive and capable of making a good first impression on others
- unconcerned with details
- active but not always productive
- willing to assume a high profile in teams, but likely to "shoot from the hip" when offering ideas or suggestions

High:

- talkative, assertive, flirtatious, and creative
- dominant in social situations, finding it difficult to allow others to contribute ideas or offer opinions
- likely to confuse activity with productivity, finding it difficult to implement creative ideas effectively
- disorganized, chaotic, and unable to follow through effectively on projects and commitments
- intuitive rather than strategic in decision making

*Underlying Schema.* High Colorful individuals are naturally gregarious. However, they mistake attention for accomplishment. These individuals report backgrounds in which attention and affirmation were based upon their charm, appearance, and capacity to entertain. Less attention was paid to competence, achievement, and persistence. As a result, these individuals doubt their capacity to perform effectively. They fear that others will notice their "weaknesses" and ignore them. Under stress, the need for approval leads to exhibitionistic and other "entertaining" behaviors. This may take the form of caricatures of gender-role stereotypes: females become charming and coquettish while males emphasize their virility and toughness. High Colorful persons value external approval over their own internal experience—they have difficulty identifying if and when they have done well. In the workplace, high Colorful employees enjoy attention and seek the spotlight in team interactions or other group encounters. They may appear innovative, but they have difficulty focusing on details and

implementing their ideas effectively. They tend to be most effective in sales positions and others that offer a high degree of visibility.

*Developmental Recommendations*. Feedback creates a dilemma for the high Colorful individuals. On the one hand, he or she will enjoy the attention. On the other, the employee will fear that his or her deficiencies have been "found out." The high Colorful individual will attempt to charm the person offering feedback to divert attention from their very real development opportunities. As a result, it is important to remain task-focused, to highlight the employee's very real strengths, and to reassure him or her that developmental feedback offers a strategy for "making a good thing better." The high Colorful employee can be encouraged to:

1. Discover alternative strategies for making a point—emotional displays attract attention but may sometimes alienate others.
2. Beware of confusing activity with productivity; notes and "to-do lists" can help ensure that specific tasks receive adequate attention.
3. Learn to listen to others, interrupting as seldom as possible, and paraphrasing what the other said as a way to ensure that it was understood.
4. Ask a trusted colleague to offer feedback regarding interpersonal strategies that are most effective in making a desired point.
5. Partner with a colleague who is more detail-oriented to increase the chances that good ideas are implemented effectively.

### 4.2.9 Imaginative

The Imaginative scale concerns the tendency to think and act in ways that are unusual, different, striking, and at times perhaps odd. Although persons with high scores tend to be interesting, entertaining, creative, and often quite visible, others may find them hard to work with because they can be unconventional, eccentric, and unaware of how their actions affect others.

*Scale Elevations*. People scoring at different elevations of the Imaginative scale are typically described as:

Low:

- practical, sensible, task-oriented, and steady
- seeking clear expectations so that life can be orderly and predictable
- quiet and unassuming in group interactions and projects
- willing to speak out only when they have something specific and functional to add to a group discussion
- unable to "think outside the box" and offer creative or innovative solutions to business problems

Moderately Low:

- socially appropriate, down-to-earth, and dependable
- good communicators who present ideas intelligibly and with good attention to implications for effective implementation

- conservative in response to business opportunities and challenges
- reluctant to embrace ideas that are not supported by data or logical arguments
- calm and steady under pressure

Moderately High:

- clever, fun-loving, and unpredictable
- dynamic, active, and eager to create ideas for change
- capable of balancing creative ideas with strategies for effective implementation
- resourceful for solving problems in teams or the larger organization
- averse to details, preferring to leave routine tasks to others

High:

- creative, innovative, unusual, and insightful
- unconventional and preoccupied with innovative ideas, regardless of their practical implications
- eccentric in self-presentational style, beliefs, and interests
- so easily bored that they lack the capacity for effective follow through
- distractible, changing focus quickly and often

*Underlying Schema.* High scorers on the Imaginative scale share with high Reserved persons an insensitivity to social cues. As the Reserved individual withdraws, however, the high Imaginative employee relishes social interaction as an arena for sharing novel ideas, opinions, and styles. Derived from early experiences that minimized adherence to social convention in favor of creative expression, the cognitive schema of the high Imaginative individual is organized around a belief in uniqueness, a need to emphasize creativity over practicality, and disregard for the impact of behavior. In the workplace they see themselves as sources of important ideas, but their belief in their own uniqueness interferes with the capacity to maintain focus, respect deadlines, and follow policies. They view teamwork as an opportunity to present multiple creative ideas. Viewing themselves as special, they are relatively immune to criticism, and failure is not a serious concern. They are best in positions in which creativity is valued and implementation is left to others.

*Developmental Recommendations*. It is important to ensure that the high Imaginative individual appreciates fully the intent of developmental feedback. He or she is likely to be puzzled that others see the necessity of change. As a result, it is important to emphasize that recommendations are intended to enhance the value of the employee's ideas and the capacity of the organization to profit from them fully. The high Imaginative person can be encouraged to:

1. Recognize that stimulating and visionary ideas are often hard for others to understand; careful consideration of strategies for implementation will give creative ideas greater credibility.
2. Focus efforts on ideas that seem most interesting to others; this will allow for a greater number of ideas to be acted upon.
3. Check frequently with superiors and colleagues to ensure understanding of their expectations for performance.

4. Partner with a colleague who may be less creative but better at implementation; by working together, ideas are more likely to be turned into action.
5. Seek feedback from trusted colleagues who can offer insight and constructive strategies for interacting more effectively with others.

### 4.2.10 Diligent

The Diligent scale concerns the tendency to be conscientious, orderly, and attentive to detail. Organization, planning ability, and hard work are all desirable qualities; however, when people exaggerate these characteristics, they are likely to be perceived as picky, critical, and perfectionistic. High scorers often have difficulty delegating or setting meaningful priorities for their work.

*Scale Elevations.* People scoring at different elevations on the Diligent scale are typically described as follows:

Low:

- relaxed, tolerant, and informal
- disorganized, poor at following schedules or managing details
- readily adaptable to changing circumstances
- comfortable in delegating tasks to subordinates
- unlikely to criticize others' performance, allowing them to think that they are doing a better job than they actually are

Moderately Low:

- able to set priorities and provide staff with clear expectations
- willing to empower subordinates, and offer them opportunities to learn and contribute to projects
- relaxed about rules and deadlines
- flexible in responding to changing expectations
- easily approached by subordinates and colleagues

Moderately High:

- mannerly, conscientious, and hardworking
- good with details
- planful, well organized, even-handed, and careful
- able to provide staff with direction and structure, but sometimes reluctant to allow them to make their own mistakes
- somewhat inflexible and slow to act because they need to find the "best" solution for every problem

High:

- polite, mannerly, and rule-abiding
- "uptight" and unable to relax with colleagues and staff
- reluctant to delegate and likely to micromanage and disempower staff
- intolerant of ambiguity, so that following rules and procedures can seem more important than finishing a project
- reluctant to try new solutions to tasks, projects, and problems

*Underlying Schema.* High scorers on the Diligent scale often report growing up in environments that valued high performance and were critical of work that seemed substandard. They seem to believe that there are only two options available in any performance situation: perfection and failure. There is no room for "shades of gray." When they think their performance will be judged, high Diligent people try to be as "perfect" as possible. It is often hard for them to gauge the importance of a given work task. They believe that it is wrong to relax their personal standards. They value rules, external standards, and social custom as guides to appropriate responses in performance situations. They believe that for things to be done correctly only they can do it. This underlying belief makes it difficult for high Diligent individuals to delegate to and empower subordinates effectively.

*Developmental Recommendations.* When offering high Diligent people developmental feedback, the goal is to help them adopt more relaxed standards for both self and others and to give up some control over projects and processes that matter to them. Because they tend to see feedback as a sign of failure (which could trigger even higher perfectionistic strivings), high Diligent people need to see feedback as supportive and designed to help them become more effective and productive. These individuals can be encouraged to:

1. Recognize that the "best" solutions to problems may not always be cost effective: "good enough" may be as valuable as "perfect."
2. Practice delegating tasks to staff, and leave them alone to try their own ideas or strategies.
3. Avoid criticizing those whose work does not reach their own potentially unrealistic standards.
4. Practice being relaxed and positive even in the face of important deadlines and other work stressors.
5. Challenge the belief that work that is less than perfect will always be criticized.

### 4.2.11 Dutiful

The Dutiful scale concerns the tendency to be eager to please others, to gain their approval, and to defer to their judgment in order to maintain cordial relations with them. Such persons seem pleasant, agreeable, and compliant, and they usually make a positive first impression. Others may find them hard to work with because they are reluctant to make decisions on their own, they are excessively careful to please their superiors, and they may not support their subordinates.

*Scale Elevations*. People scoring at different elevations of the Dutiful scale are typically described as:

Low:

- independent and self-reliant
- willing to challenge the opinions of supervisors, colleagues, and team members
- too eager to attempt novel solutions to problems without adequately considering their impact on other people or the organization
- capable of becoming a "loose cannon" who does not adequately consider

the feelings or opinions of others

- dismissive of constructive feedback from supervisors and peers

Moderately Low:

- independent and tough minded
- self-sufficient, confident, and willing to disagree with others when appropriate
- loyal to their staff and team members and willing to support them to superiors
- not bothered by negative feedback and constructive criticism
- willing to go to bat for his or her opinions and challenge the opinions of superiors

Moderately High:

- agreeable, pleasant, and cooperative
- eager to please, polite, responsive, and a good team player
- quick to keep bosses and other superiors informed about progress and successes
- reluctant to "rock the boat" or disagree with superiors
- supportive of corporate policy and a good "organizational citizen"

High:

- cordial, mannerly, attentive, and socially appropriate
- indecisive and conforming
- reluctant to act independently, relying too heavily on others to make decisions
- unwilling to support subordinates if this is expected to displease superiors
- promising more than can be delivered in an effort to please others

*Underlying Schema.* High Dutiful individuals grew up in families that were caring and nurturant. The child's basic needs were met, allowing him or her to trust caregivers and others in positions of authority. However, the parents failed to "pull back" as the child became capable of self-sufficiency. Lacking mastery experiences, the child failed to develop a sense of competence and self-efficacy, continuing to believe that he or she must rely on others. The unknown is to be avoided, as the high Dutiful individual doubts his or her capacity to cope with novel challenges or situations. Fear of abandonment by those in authority persists. In the work environment, the high Dutiful employee seeks to accommodate those in authority in order to maintain their good will. Belief in the self as ineffective impairs the high Dutiful employee's capacity to think independently, offer controversial opinions, or take initiative with projects and colleagues. Such employees lack self-assurance under pressure and abdicate important decision making.

*Developmental Recommendations.* As the high Dutiful employee is likely to receive developmental feedback as evidence that he or she has disappointed those in positions of authority, feedback will be most effective when it is presented as evidence of the organization's concern for the employee's overall success and well being. Although this will seem like a conundrum, the high Dutiful employee can be assured that supervisors will be pleased when he or she shows greater autonomy and initiative. Thus, high Dutiful employees can be encouraged to:

1. Consider that successful people understand that disagreement is not tantamount to criticism or rejection.

2. Recognize that independent thinking will increase their credibility and stature with those in authority, not diminish it.
3. When asked for an opinion, take a moment, identify a position, and marshal arguments to defend it if challenged.
4. Enhance the loyalty of staff by being loyal to them, even if this means disagreeing with other colleagues or superiors.
5. Practice saying "no" and asserting independence when faced with a request that is unreasonable in its context.

## 4.3 An Interpretive Strategy

The behaviors associated with the dysfunctional dispositions assessed by the HDS emerge during times of stress, rapid change, fatigue, boredom, or simply when the person is not managing his or her behavior effectively. These behaviors can seriously degrade performance in the workplace. The preceding section offered guidelines for interpreting a person's scores on each of the HDS scales. Table 4.1 is a simplified interpretive guide to the most common behavioral manifestations of high and low scale scores. The HDS is most useful, however, when examined from a perspective that goes beyond considering each scale score in isolation. This section offers additional suggestions for maximizing the interpretive power of this assessment.

Table 4.1
A Quick Guide for Interpreting the HDS

| HDS Scale | Low to Average Scores | High Scores |
|---|---|---|
| Excitable | Predictable, calm, stable | Unpredictable, emotional, moody |
| Skeptical | Trusting, forgiving | Suspicious, vengeful |
| Cautious | Adventurous, confident | Timid, fretful |
| Reserved | Insightful, sensitive, sociable | Imperceptive, tough, detached |
| Leisurely | Good natured, committed | Passive-aggressive |
| Bold | Modest, self-restrained | Confident, self-promoting, entitled |
| Mischievous | Conforming, risk-averse | Risk-taking, nonconforming |
| Colorful | Quiet, unassuming | Attention-seeking, self-dramatizing |
| Imaginative | Conventional, conservative | Unconventional, original, creative |
| Diligent | Tolerant, flexible | Meticulous, inflexible, critical |
| Dutiful | Independent, autonomous | Conforming, eager to please |

### 4.3.1 The Value of Multiple Data Sources

The HDS is a powerful tool for assessing the flawed interpersonal strategies that can degrade performance in the workplace. Greater interpretive power can be gained when HDS data are examined in the context of a broader assessment battery. For example, considering the results from a measure of normal personality such as the Hogan Personality Inventory (HPI; R. Hogan & Hogan, 2007), can amplify the power of both assessments. Scores on the HDS and HPI scales do not correlate highly (see Chapter 3); thus, each taps different aspects of personality and behavior. The HPI concerns the "bright side" of personality: characteristics that

emerge when people are at their best. The HDS, in contrast, measures "dark side" characteristics that can undermine career success. Evaluating an individual from both these perspectives offers greater precision in interpretation than what is provided by either assessment alone. Later in this chapter we offer examples of the use of the HDS and the HPI together to enhance understanding of a respondent.

### 4.3.2 Configural Analysis

We do not recommend interpreting any single scale in isolation; the meaning of scale scores depends on the context in which they appear—that is, the meaning depends on the elevations of the other scales. As a first step in interpreting scores on the inventory, it is useful to recall the factor structure of the HDS as seen in Table 2.4. The inventory can be decomposed into three broad components. The first is defined by the Excitable, Skeptical, Cautious, Reserved, and Leisurely scales and reflects a syndrome whose components include feelings of anxiety and insecurity, mistrust, hostility, and social withdrawal. We suggested earlier that this syndrome corresponds to what Horney (1950) characterized as "moving away from others" in order to deal with interpersonal insecurity. Persons with high scores on this syndrome are typically nervous, dysphoric, and often in a bad mood. This component resembles what Tellegen (1985) and others (cf. Watson & Clark, 1984) refer to as "negative affectivity."

The second component is defined by the Bold, Mischievous, Colorful, and Imaginative scales. This syndrome reflects social self-confidence, impulsivity, energy, competitiveness, and a talent for self-display. This corresponds to what Horney (1950) labeled as "moving against others:" overwhelming, co-opting, persuading, and manipulating people as a way to manage interpersonal relationships. This syndrome also resembles what Tellegen (1985) and others call "positive affectivity." Privately, some individuals scoring high on this factor doubt their abilities and competence; the public display compensates for perceived weaknesses. For others, any self-doubt (if it exists at all) is so well masked that even the individual is unaware of it.

The third component is defined by the Diligent and Dutiful scales. This is a syndrome consisting of conformity, obedience, and eagerness to please—what Horney (1950) described as "moving toward people" as a way to cope with one's insecurities. Individuals scoring high on these scales build alliances and seek approval through attention to detail, social acquiescence, and an aversion to doing anything that could "rock the boat."

Many other configurations are possible with the HDS scales, however, it is not possible to offer a theory-based conceptualization of each. Rather, these examples illustrate the importance of examining each scale score in the context of a person's scores on the other scales of the assessment. Examples later in this chapter suggest a useful approach for making sense of a person's pattern of scores on the HDS.

### 4.3.3 Conflict Analysis

One important use of Configural Analysis is to make sense of apparent contradictions among a respondent's scores on certain HDS scales. These are cases where elevations on certain scales result in competing derail-

ers. The most significant conflicts occur when elevations occur on scales from different super factors described in the preceding section (Moving Away, Moving Against, and Moving Toward). Because these super factors are associated with different behavioral tendencies, elevations that cross factors inherently create conflict in terms of the person's strategy for managing insecurity and social distance in times of stress.
For example, we would not expect people to have elevated scores on both the Cautious (careful and deliberate) and Mischievous (reckless and limit testing) scales; nevertheless, some do. In cases such as this, it is important to make as much sense as possible of the apparent contradiction. The scores that seem to conflict were, after all, provided by the same person; there must be some way of reconciling them.

Most often, conflicted scores—especially those crossing super factors—arise from one of three possibilities. First, behaviors associated with the contradictory scale elevations may emerge in different types of stressful situations. This suggests that there are multiple underlying schemas linked to different developmental processes. In our example, the person may have learned early in life to avoid getting caught in mistakes. As a result, this person may be very careful when being watched. At the same time, the person may have enjoyed success by taking chances while behaving anonymously—in large crowds or different cities where few people know him/her well. If these situational differences are not well defined, it is hard to predict which characteristics will appear.

Second, behaviors associated with elevations on one HDS scale can meet the needs implied by an elevation on another, seemingly contradictory, scale. In our example, the person may use apparent aversion to risk (as implied by his or her high score on the Cautious scale) as a cover or disguise for his/her more reckless tendencies (high Mischievous).

Third, the conflict in scale elevations may reflect a very real conflict in a person's psychological makeup. Consider a person with high scores on the Imaginative and Diligent scales. The high score on Imaginative connotes a rather eccentric free-thinker who can offer creative and innovative ideas. The high Diligent score, in contrast, describes a person who values rules and order while resisting ambiguity and the unknown. This contrast is the product of competing needs for attention and perfection, reflecting conflicting schemas established at different developmental stages. After offering creative ideas for addressing a problem, this person is likely to experience considerable anxiety in an attempt to find the one "best" solution. "Paralysis by analysis" may keep any idea from being defined, selected, and implemented. Thus, the Imaginative/Diligent conflict indicates that the person has not learned to find an effective balance between creative thinking and the need for perfection, often leading to ongoing internal turmoil.

Conflict interpretation is one of the most difficult, but potentially one of the most meaningful, aspects of HDS interpretation. Considering the schemas that underlie different scale elevations and recalling that all potential derailers are flawed strategies for "getting along" and "getting ahead" in the organization can allow apparent contradictions to be reconciled effectively. Chapter 9 in the *Hogan Guide* (R. Hogan et al., 2007) offers ideas for resolving a number of additional HDS conflicts beyond those described here.

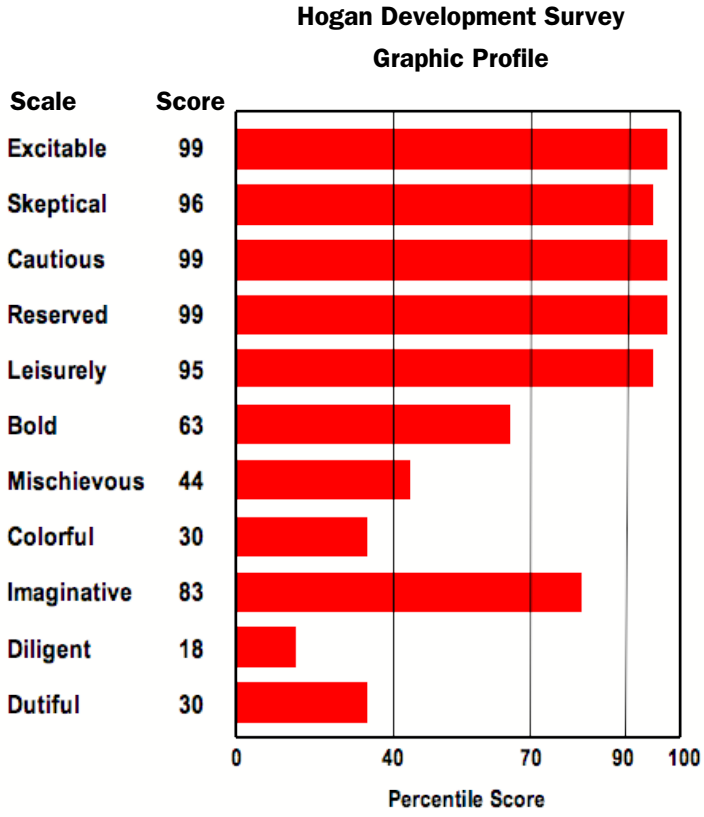
## 4.4 Sample HDS Profile Interpretations

To illustrate further the power of the HDS in making sense of behavior patterns that may interfere with effective job performance, we offer seven additional examples. Consistent with our belief that the HDS is most meaningful when considered in conjunction with a measure of the "bright side" of personality, our examples include consideration of scores derived from the Hogan Personality Inventory (HPI). The HPI, like any other well validated measure derived from the five-factor model of personality, describes the person at his or her best—in a job interview or when all at work is going well. HPI scores can also offer clues to how the person may (or may not) manage the "dark side" characteristics that can emerge when he or she is bored, stressed, overburdened, or simply not managing behavior effectively.

### 4.4.1 The "Moving Away" Profile

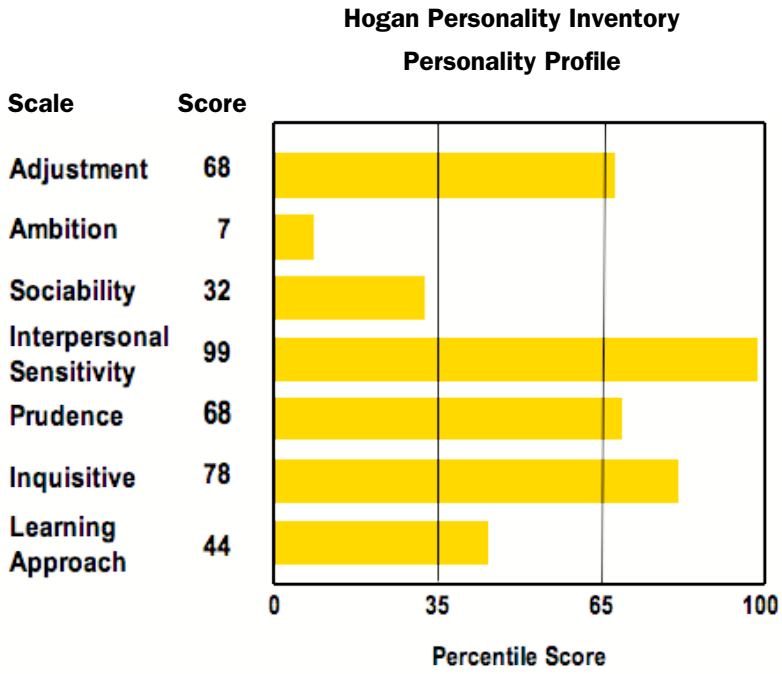
Consider Figure 4.1. This profile is heavily weighted by the first factor of the HDS; it typifies a person who is prone to mercurial emotional reactions that swing between passionate enthusiasm and intense distaste (Excitable), who is keenly alert for signs of betrayal and/or disapproval and who, when he detects those signs, may challenge, accuse, confront, or retaliate (Skeptical). Beneath the prickly exterior, this person is insecure and afraid of criticism (Cautious), deeply resentful of his superiors (Leisurely), but quiet, withdrawn, and preferring to work alone (Reserved). Therefore his insecurity and resentment should go largely unnoticed.

Figure 4.1
HDS "Moving Away" Profile



These characteristics maintain distance between this man and other people. In addition, it is apparent that he is also nonconforming and independent (low Diligent and low Dutiful). While he is alone, he generates interesting, odd, and sometimes far-fetched ideas about his life and what is happening to him (Imaginative). Figure 4.2 is this man's HPI profile, which suggests that he will seem bright and imaginative (HPI Inquisitive and Learning Approach, HDS Imaginative), very agreeable and eager to please (HPI Interpersonal Sensitivity), and reasonably self-confident (HPI Adjustment). But he is also likely to impress others as passive, diffident, and unassertive (HPI Ambition and Sociability). Although lacking drive and assertiveness, this man would otherwise make a very positive impression as a job applicant. In this case, the HPI suggests that he has enough social skill (as indicated by the moderately high score on Interpersonal Sensitivity) to hide his seething resentment and profound insecurity; these tendencies will appear only during stress and/or heavy work loads.

Figure 4.2
HPI "Moving Away" Profile



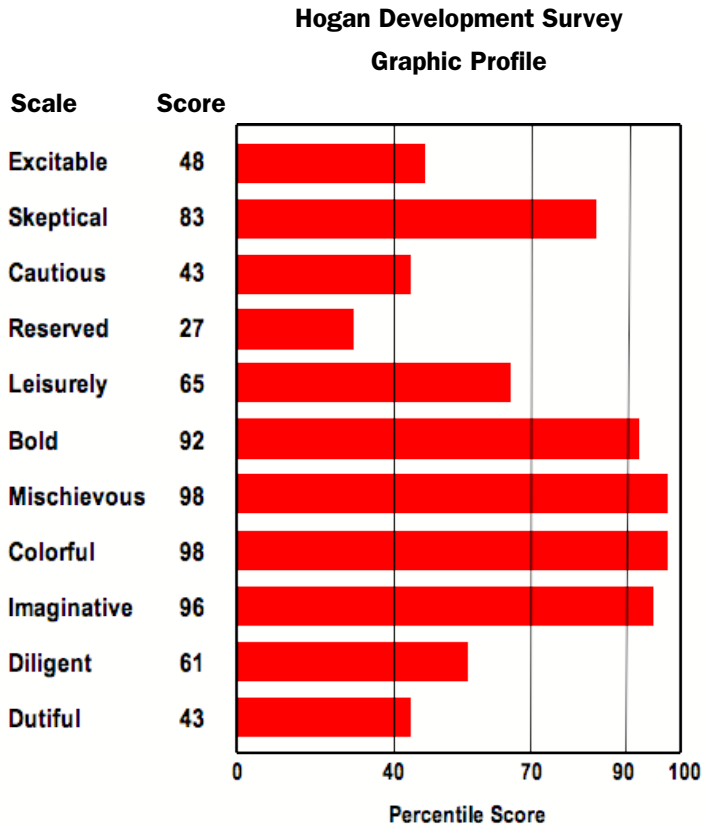

In fact, this man is a locomotive engineer who works for a railroad. His work requires that he spend long periods of time alone and away from home—which suits him well—during which time he probably broods on how he has been unappreciated and mistreated by his managers. Although the consequences of his brooding may not suit society well, his overall dysphoria will be hard to detect on casual contact.

### 4.4.2 The "Moving Against" Profile

Figure 4.3 reflects a profile that is heavily influenced by the second factor of the HDS; it is a person who is outgoing and insightful (low Reserved), self-dramatizing, exuberant, and impulsive (Colorful), excitement-seeking and limit-testing (Mischievous), confident, bright, and charismatic (Bold), and creative and innovative (Imaginative). There is also a tendency to distrust others in the organization and to feel exploited by them (Skeptical).

Uniformly high scores on the second component of the HDS suggest public self-confidence that may obscure private self-doubt. In the present case, this possibility is supported by the person's low score on the HPI Adjustment scale (see Figure 4.4). The HPI also indicates that this man will seem, during an interview, to be bright, imaginative, colorful, and self-dramatizing. Beneath the "hail-fellow-well-met" façade is a good deal of self-doubt and generalized hostility (cf. the low HPI Adjustment score and the moderately high score on the HDS Leisurely scale). Not hidden is substantial impulsivity (high Mischievous) and arrogance (high Bold) that

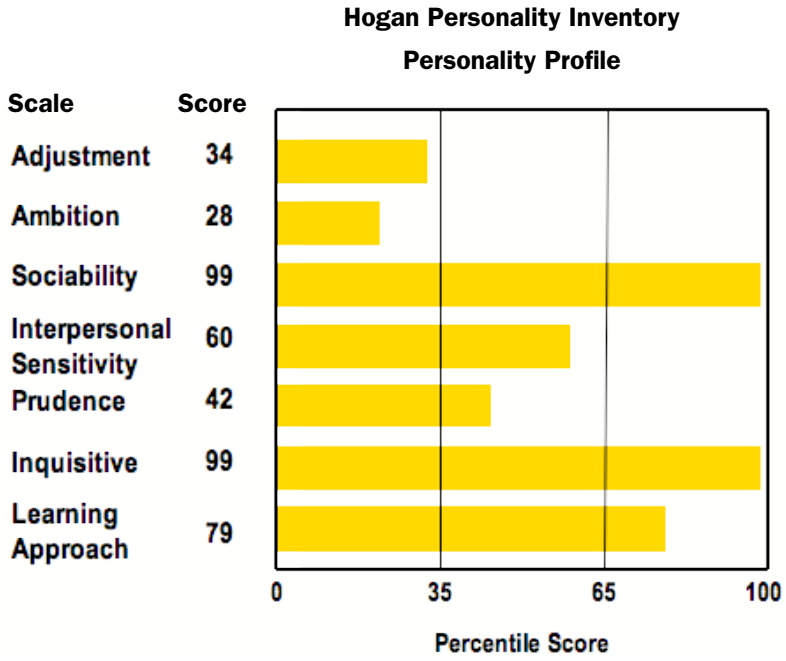
Figure 4.3
HDS "Moving Against" Profile



are most likely to emerge when this individual is facing a heavy work load or interpersonal conflict; it is in these "stressful" contexts that his need to control events by dominating, dazzling, or intimidating others (the core features of the "moving against" constellation of behaviors) can be expected to emerge.

Indeed, these are the profiles of a management trainee in a Fortune 500 company. He will make a strong impression during an interview, but on a daily basis his noisy self-promoting tendencies will begin to be resented. For development, he needs learn to calm down, listen effectively, and not be quite so hard on himself. Interestingly, if his HPI Ambition score were higher, we could infer that his need to get ahead would motivate him to moderate his arrogant and attention-seeking behaviors more effectively.

Figure 4.4
HPI "Moving Against" Profile



### 4.4.3 The "Moving Toward" Profile

Figure 4.5 is typical of a profile heavily weighted by the third component of the HDS. It is the profile of an individual who is mild-mannered and good-natured (low Excitable, Skeptical, and Leisurely), modest and quiet (low Bold and Colorful), and reluctant to take risks (low Mischievous). Although she attends to and is concerned about others' feelings (low Reserved), she is moderately concerned about the opinions that others have of her (Cautious). Problems can emerge due to her need to be careful, conforming, and reluctant to take chances (high Diligent and Dutiful). Figure 4.6 is this woman's HPI profile. This profile suggests that she will seem concrete-minded and unimaginative (low Inquisitive and Learning Approach) but exceedingly pleasant, cooperative, and easy to supervise (high Interpersonal Sensitivity and Prudence). Her high score for HPI Sociability mirrors her low score for HDS Reserved. In this case, there are strong parallels between the HDS and HPI profiles.

Figure 4.5
HDS "Moving Toward" Profile

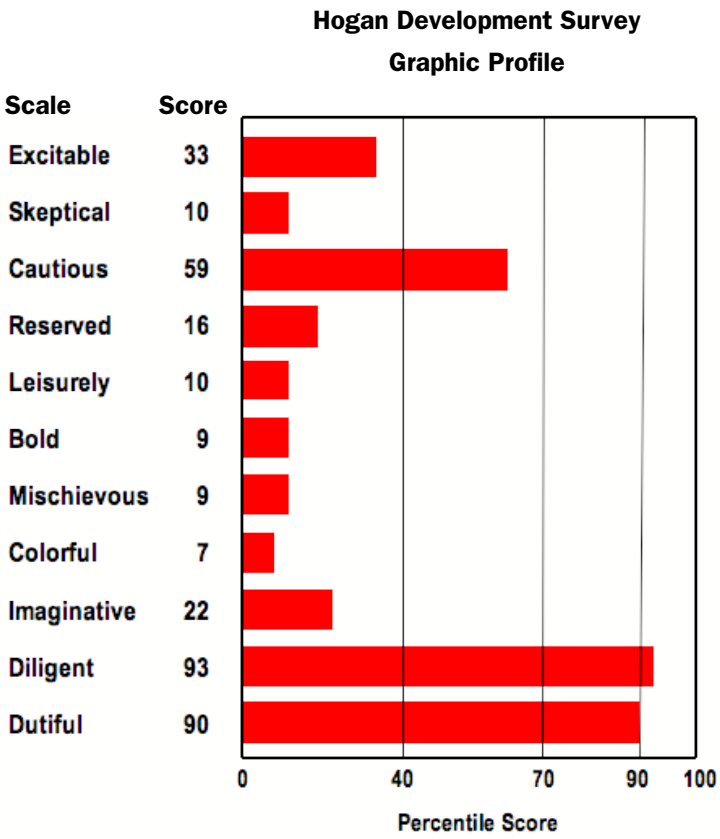



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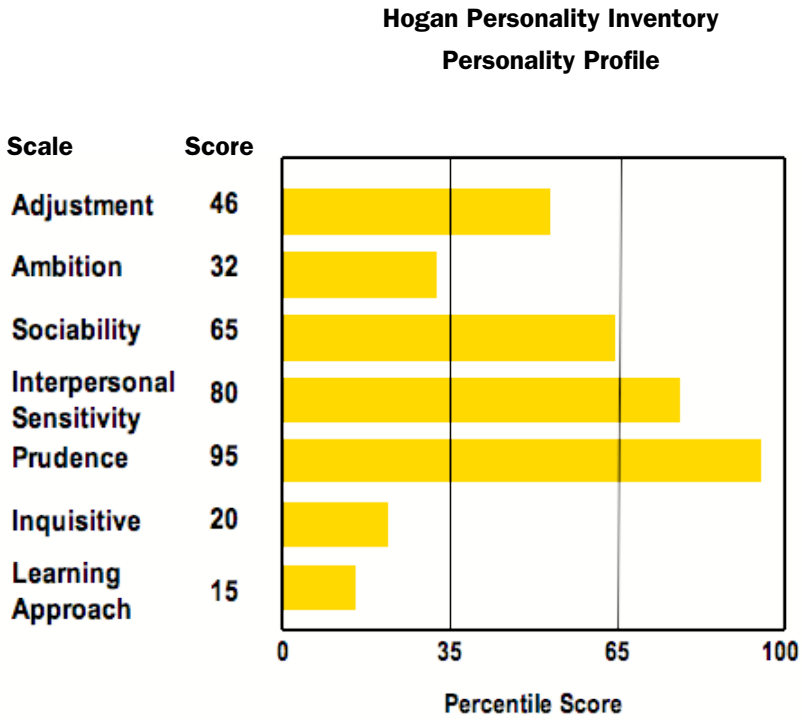
Figure 4.6
HPI "Moving Toward" Profile

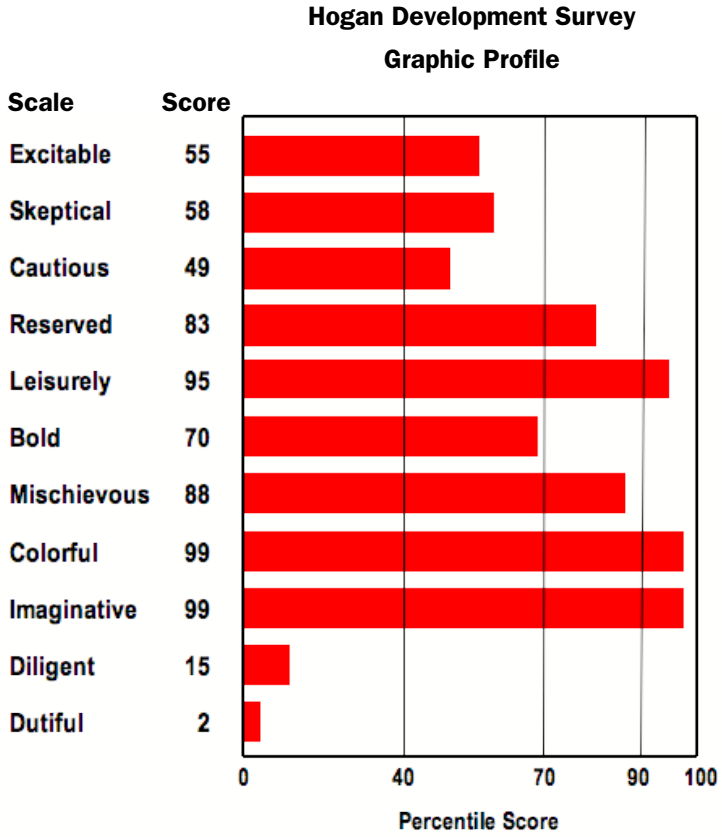



This person may be in many ways an exemplary employee because she follows rules carefully and is unusually eager to please. Still, her high scores on the HDS Diligent and Dutiful scales suggest that she will be reluctant to take initiative, will resist innovation, and will tell colleagues what she believes they want to hear rather than what they need to hear. She is so perfectionistic that she may miss deadlines and micromanage those to whom she must delegate work. Her modesty and lack of charisma suggest that she would not perform well in sales or management; she may be well suited to her current position in the accounts payable department of a major corporation.

### 4.4.4 The "Corporate Guerilla" Profile

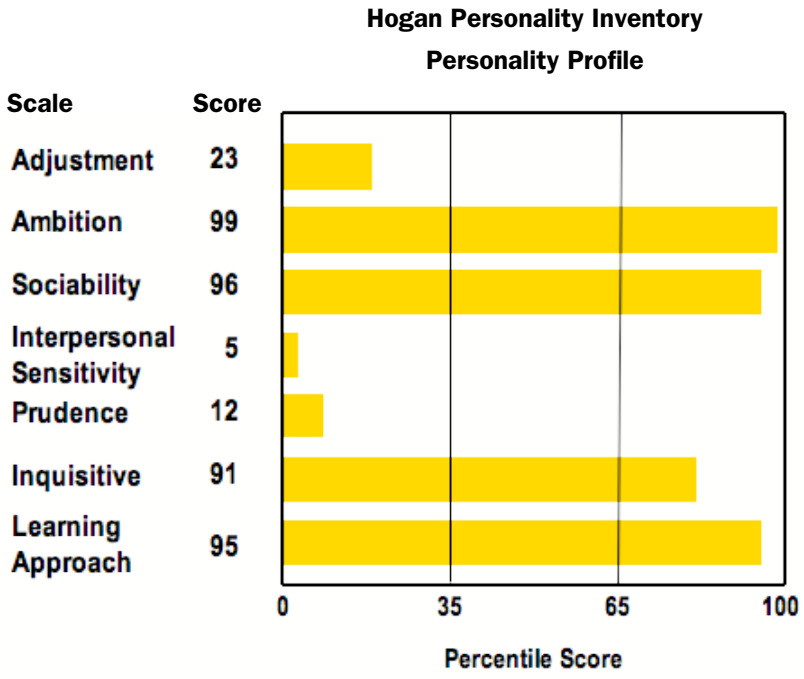
Figure 4.7 is the profile of a person who seems bright, energetic, dynamic, and self-promoting (Bold, Colorful); innovative and imaginative but perhaps lacking good judgment (Imaginative); tough, independent, and indifferent to social expectations (Reserved, low Dutiful); and unconcerned with details (low Diligent). Dominated by high scores on the scales comprising factor 2 of the HDS, this person appears self-confident and assertive. However, the high Leisurely score suggests significant resentment, and the high score on Mischievous and low scores on Diligent and Dutiful suggest impulsivity and nonconformity.

Figure 4.7
HDS "Corporate Guerilla" Profile




This person's HPI profile (see Figure 4.8) confirms these suspicions; his very low score on Adjustment suggests that his self-confidence is more assumed than real. His low Prudence and high Sociability suggest the potential for limit-testing, impulsivity, and other "delinquent" behaviors, modified only by his high Ambition—his career aspirations may moderate his natural hostility and impulsivity. Still, this is a profile of an individual who may present himself as motivated toward meeting corporate expectations while he covertly sets his own rules, feels considerable resentment toward management, fails to consider adequately the consequences of his actions, and advances his own agenda at the expense of others. It is the subtle and covert nature of these actions that leads us to label him a "corporate guerilla."

Figure 4.8
HPI "Corporate Guerilla" Profile

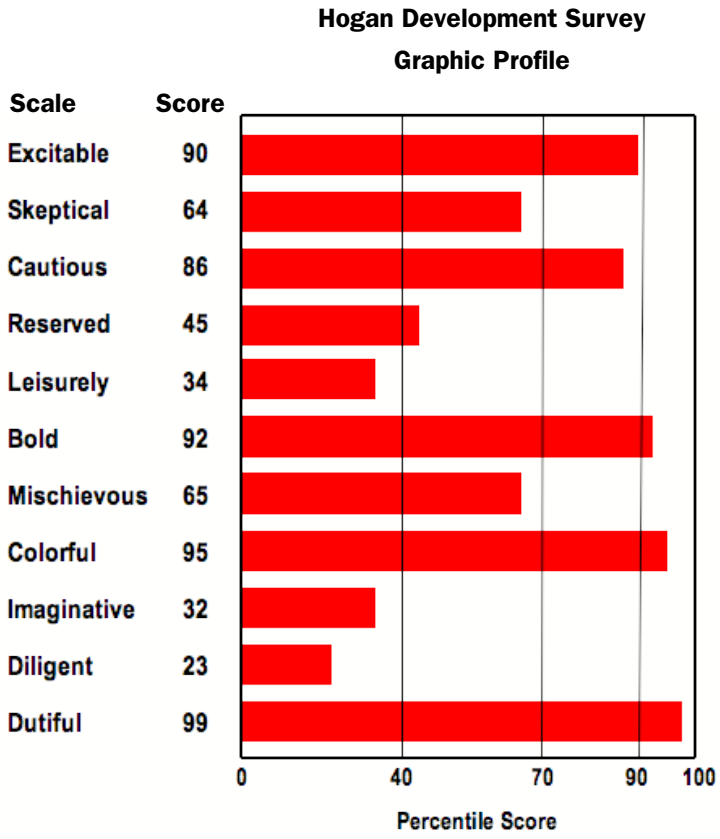



This man's HPI, taken alone, suggests that he is bright and charismatic; in an interview, one will be dazzled by his wit and interpersonal skill. This highlights the utility of the HDS in penetrating beneath the interpersonal glitter. In fact, this person was a senior manager in a large organization. His charisma, intelligence, and ability to manipulate his superiors put him on a fast career track. However, his cavalier disregard for rules and his need to advance his own agenda at the expense of others finally caught up with him. Fortunately for the people below him, his career finally derailed.

### 4.4.5 The "Insecure Showboat" Profile

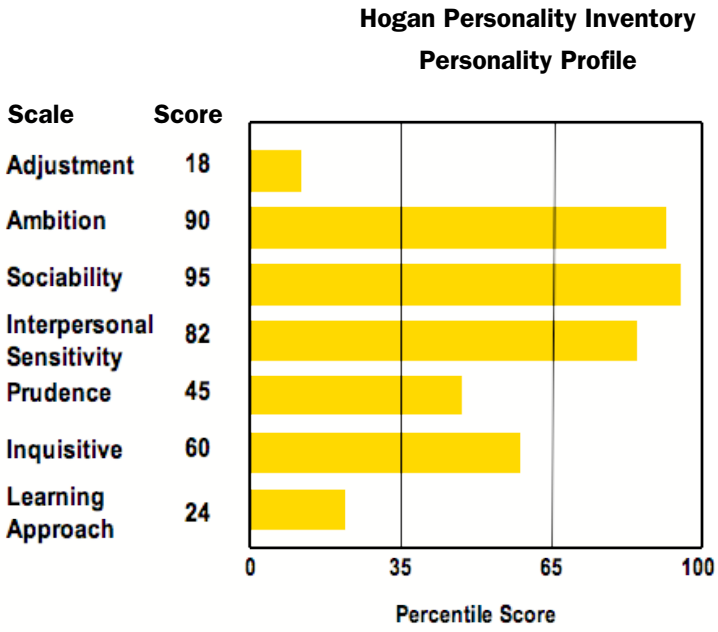
Figure 4.9 illustrates an unusual and complex pattern of HDS scores: there is at least one significant elevation on scales from each of the three primary factors. This individual's high Bold connotes confidence (bordering on arrogance), a sense of entitlement, and unrealistic expectations of success. She seeks the spotlight and enjoys being the center of attention (Colorful), although she is not particularly creative (low Imaginative). At the same time, she distrusts others (moderate Skeptical), is emotionally volatile, and gives up easily on projects when frustrations or roadblocks arise (Excitable). Uncharacteristically for someone scoring high on Bold and Colorful, she simultaneously fears being embarrassed or disgraced (Cautious), and it is important to her to maintain favor with those in positions of authority (Dutiful).

Figure 4.9
HDS "Insecure Showboat" Profile




On the HPI (see Figure 4.10), this woman's very low Adjustment score supports the insecurity suggested by her high Excitable and Cautious scores. Her high Ambition, Sociability, and Interpersonal Sensitivity scores indicate that she will be charming and energetic in an interview and in routine work interactions. Nevertheless, her HDS indicates that these behaviors are simply a veneer for considerable private self-doubt. She may impress others as self-confident and assured (Bold). But when things do not go her way, she is likely to become emotional and highly critical (Excitable). These outbursts, of course, serve the need for attention denoted by her high score on Colorful. It is in the aftermath of the emotional upheaval that the fear of rejection and the need for the approval of others (Cautious and Dutiful) emerge. As others withdraw in response to the emotional display, this woman panics (at least internally) and becomes more deferential and compliant in order to reestablish the relationship. The atypical pattern of HDS scale scores indicate that the person's self-centered, attention-seeking, and arrogant behaviors compensate for underlying self-doubt. This is in contrast to the purely high Bold individual whose self-schemas concern uniqueness and entitlement—such people would never stoop to Dutiful behaviors!

Figure 4.10
HPI "Insecure Showboat" Profile




Indeed, these profiles reflect the scores of a woman whose master's degree in psychology allowed her to enter the human resources department of a major corporation. Her apparent confidence and interpersonal skill caused her to rise rapidly through the department to the point at which she had considerable discretion and managerial authority—it was in this position that her volatility (Excitable) and obsequious behaviors (Dutiful) alternated so rapidly that neither superiors nor subordinates knew which side they would see from moment to moment. She angrily resigned her position when superiors confronted her about these patterns and made ongoing developmental coaching a requirement for continued employment.

### 4.4.6 The "Litigious" Profile

The profile presented in Figure 4.11 is dominated by high scores on the Excitable, Leisurely, Skeptical, Imaginative, and Diligent scales. This represents another example of high scores on at least one scale of each HDS factor. This person is resentful and easily upset (Leisurely and Excitable), suspicious about the motives of others (Skeptical) and has odd or unusual theories about others' intentions (Imaginative). He can be fussy, picky, critical, and acutely attuned to how things "ought" to be (Diligent). His HPI profile (see Figure 4.12) suggests that he is ambitious, socially skilled, impulsive, and achievement oriented—but also potentially delinquent (low Adjustment and Prudence combined with high Sociability). He can interview well, so that his charisma and interpersonal skill will mask his suspicious and resentful side, as well as his tendency toward deviousness and possible delinquent behaviors. Indeed, although he expects that others are likely to exploit or disparage him, he may have concluded (unconsciously, at least) that by appearing charming and sociable, others will "let their guard down" so that their "true colors" can emerge.

This man works for a large and generally fair-minded corporation that tries hard to respect the dignity and worth of all employees. He filed a major complaint with the Equal Employment Opportunity Commission after being denied a promotion.

Figure 4.11
HDS "Litigious" Profile

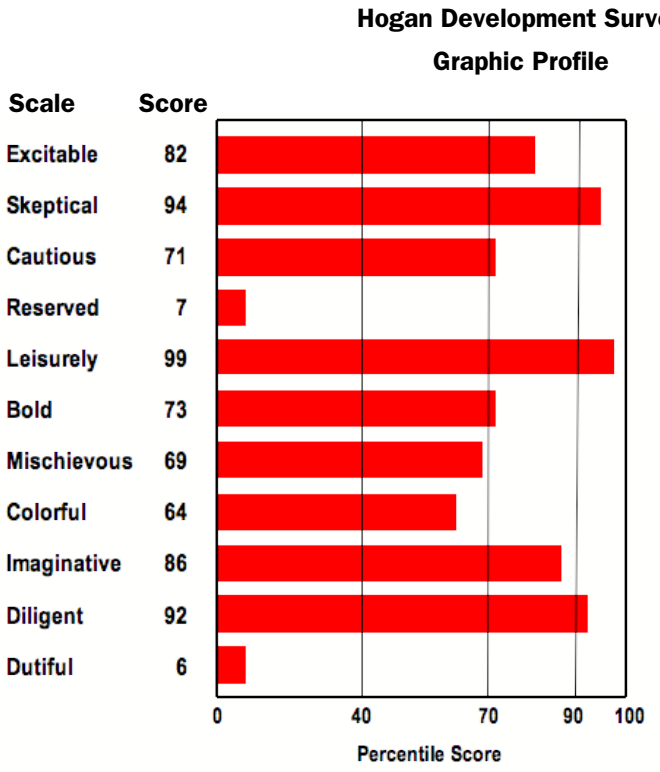
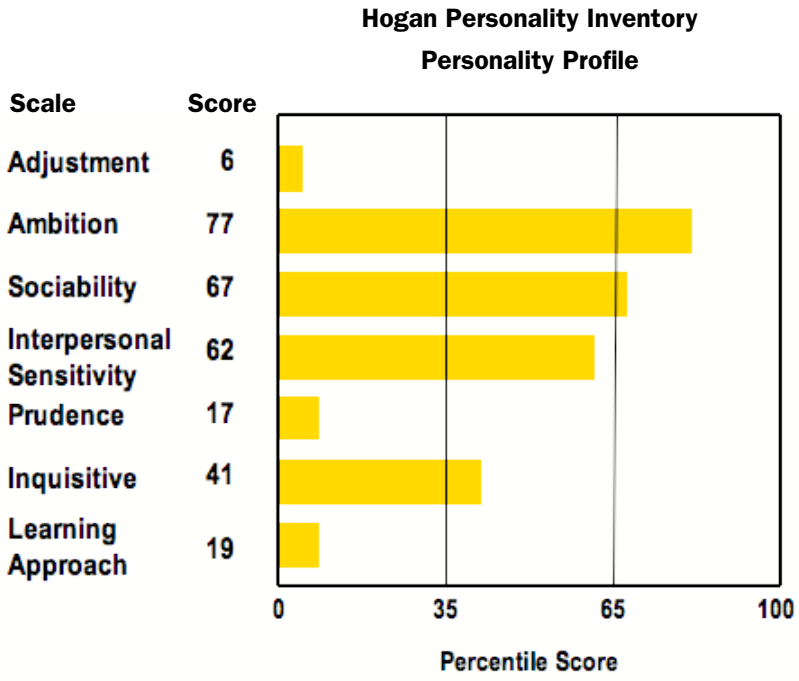


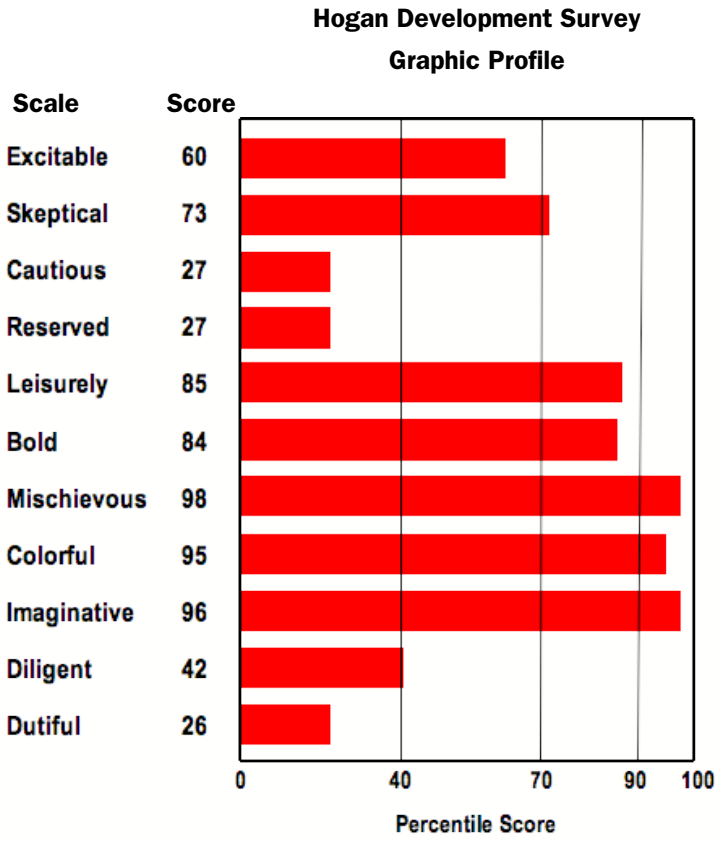
Figure 4.12
HPI "Litigious" Profile




### 4.4.7 The "Fear-Driven Salesman" Profile

The most distinctive feature of the profile presented in Figure 4.13 is the elevation on all the HDS scales of global Component 2: Bold, Mischievous, Colorful, and Imaginative. This elevation suggests that this man will seem outgoing, confident, dynamic, risk-taking, creative, impulsive, self-dramatizing, and highly entertaining. His low score on the Reserved and Cautious scales suggest that he is adventurous, sociable, and unconcerned about others' reactions to him, while the moderate Skeptical score indicates that he reads social and political cues quickly and well. His low scores on Diligent and Dutiful further suggest that he will be somewhat indifferent to social feedback, independent, and not good with details or follow through.

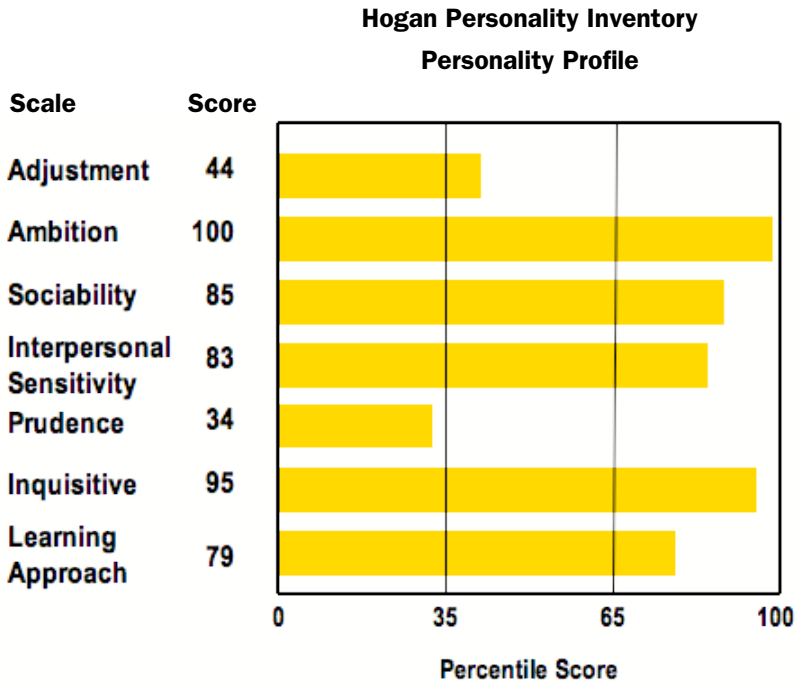
Figure 4.13
HDS "Fear-Driven Salesman" Profile




This pattern is typical of high-powered sales people. A glance at this man's HPI profile (see Figure 4.14) confirms the inference that he has a lot of potential for work in sales. In fact, his HPI profile—moderately low scores for Adjustment and Prudence, and relatively high scores on all the other scales—is prototypic of successful sales people. Those who are successful in sales are typically dynamic, charming, socially skilled, bright, imaginative, and flexible. Missing from the HPI profile, though, is a complement to his high score on the HDS Leisurely scale. This high score, especially in conjunction to his moderately high score on Excitable, suggests that, in addition to drive, charisma, and creativity, this man has some fairly strong private self-doubts. He is likely to be easily irritated by others at work, and he is likely to clash with his supervisors.

In fact, this man's supervisor describes him as a very good salesman but also a "shame-based overachiever" who takes on too much and sometimes leaves projects unfinished and details uncovered. For development, this man needs to learn to relax and to work closely with another person who will help him with detailed follow-through. What he has—his talent for sales—cannot really be taught. What he needs to learn is some tolerance for frustration and the capacity to listen more effectively to others' perspectives. He needs to understand that he is more irritable, resentful, and critical than is good for his career.

Figure 4.14
HPI "Fear-Driven Salesman" Profile




## 4.5 Uses

In our experience, there are five primary uses for the HDS, although the assessment is being used increasingly in a variety of additional applications. The first, and by far the most frequent use for the HDS, is for coaching and development. The HDS is relatively independent of the HPI, which means that a person can have an attractive HPI profile and a potentially problematic HDS profile. This means, in turn, that the person will interview well and create a positive first impression on others. Over time and under pressure, however, the themes captured by the HDS will become apparent and may have an adverse impact on the person's career. Moreover, people are often unaware of the tendencies that they display when they are stressed or otherwise failing to manage their interpersonal behavior effectively. Generally speaking, any developmental effort must begin with assessment, and that is certainly true in the case of dysfunctional dispositions. The HDS provides clear and explicit information regarding those aspects of a person's interpersonal performance that require extra attention.

In the development context, the HDS can offer at least three important types of information (cf. Nelson & Hogan, 2009). First, leaders benefit from learning about the impact their behavior has on others (e.g., through a 360-degree multi-rater assessment); knowledge of the dysfunctional strategies they use in their interpersonal interactions will enhance their "strategic self-awareness" (Hogan & Benson, 2009) and assist them in making sense of others' perceptions, providing a focus for change efforts. Second, awareness of the dysfunctional patterns captured by the HDS can allow coaches or mentors to evaluate whether deficits in leadership skill are simply a product of inadequate learning or a product of faulty interpersonal strategies that interfere with effective performance. Third, the HDS can offer clues to a leader's likely response to the coaching process itself.

This allows the coach or mentor to create the type of coaching relationship most conducive to long-term change.

The second major use of the HDS is in selection contexts where a measure of psychopathology (such as the MMPI) has historically been used, e.g., evaluating applicants for work as a police officer, security guard, airline pilot, air traffic controller, etc. The HDS has several advantages relative to the MMPI. First, it was explicitly designed so that there are no questions related directly to indicants of psychopathology—an important consideration in selection contexts in which questions regarding medical or psychiatric problems are prohibited. The item content of the HDS is much less offensive than the content of instruments specifically targeting possible psychopathology, and the items have fewer disability-related implications. Second, the HDS is much shorter. Finally, the scales are known to predict poor performance in many jobs. The MMPI was validated against diagnostic statements by clinicians. The HDS, on the other hand, was validated against indices of job performance—i.e., a high score on the Diligent scale should predict an inability to prioritize or delegate (cf. Chapter 3). In principal, then, the HDS should be more useful than the MMPI in employment contexts; conversely, the MMPI should be more useful than the HDS when one is trying to make a psychiatric diagnosis.

The third use of the HDS is in selecting people for high level or responsible positions in organizations. As we indicated in Chapter 1, failure rates for executives in corporate America may be as high as 65%. The reason for this high failure rate, in our judgment, is that senior managers are chosen on the basis of an interview—which is the same thing as a beauty contest. The most charming and articulate candidate—assuming equal past credentials—gets the job. But the entire concept behind the HDS is that many people who can put on a skillful performance for an hour or two are often flawed in ways that won't appear in an interview. Indeed, they may be flawed in ways that actually enhance their performance in an interview, e.g., narcissistic, dramatic, or sociopathic tendencies. Organizations are willing to screen entry-level employees for integrity, but they seem reluctant to screen upper-level managers and executives for the same problems—and it is the latter group who are in a position to do real damage to an organization (R. Hogan, 2007; R. Hogan, Curphy, & Hogan, 1994).

Fourth, the HDS can offer information regarding a person's decision-making style—especially when he or she feels pressured, overburdened, or otherwise under stress. In general, individuals with high scores on the Bold, Mischievous, or Colorful scales will make quick decisions; however, these decisions are typically oriented toward advancing the person's organizational stature and may lack consideration for the decision's impact on others. Similarly, persons scoring high on the Reserved scale of the HDS (especially if they score low on the Interpersonal Sensitivity scale of the HPI) will make decisions that seem logical and well considered, but which may have significant negative impact on others around them. High Imaginative individuals will be creative and innovative in decision making, but with little regard for the workability or practical utility of their recommended course of action. Those scoring high on Excitable or Skeptical will offer decisions that are emotionally based, and they will feel resentful and devalued if their suggestions are modified or rejected. Those scoring high on Cautious, Leisurely, Diligent, and Dutiful will be averse to making decisions, though for different reasons. The high Leisurely person procrastinates as a passive means of control, the high Diligent person gets stuck trying to

make the “best” decision, the high Dutiful person seeks to keep everyone happy (which, of course, is impossible), and the high Cautious person fears that the decision will be criticized or rejected. As has been said about the high Cautious individual, “the next decision he makes will be his first.”

Finally, the scales on the HDS provide reasonable clues as to how a person will perform as a member of a team. Generally speaking, persons with high scores on the Cautious, Diligent, and Dutiful scales will be good team players because they are so conforming and eager to please. Conversely, persons with high scores on the Bold, Mischievous, Colorful, and Imaginative scales will tend to be disruptive because they will want to be the center of attention, won’t follow rules, and will compete with other team members. Persons with high scores on the Leisurely scale will do fine face-to-face, but they will procrastinate on completing assignments away from the team context. Persons with high scores on the Excitable, Skeptical, and Reserved scales will be less than desirable team players because they are so moody, aloof, distrustful, and/or obtuse.

# 5. ADMINISTERING THE HDS

As publisher of psychological assessments, Hogan Assessment Systems (HAS) provides a state-of-the-art administration platform developed to meet the needs of clients. Since the mid 1990's, the delivery for the HDS has been through a web based assessment platform. The assessment platform was designed and is maintained for security, ease of use, speed, and flexibility. The platform uses leading edge technologies such as web services, middleware, and XML. The flexibility of these technologies allows customized solutions appropriate for clients of all sizes. An overview of key features of this system is presented below. For further information please contact HAS' Customer Service Department at 1-800-756-0632 or customerservice@hoganassessments.com. Office hours are 8am-5pm (US Central Time) and after hours messages are checked daily.

## 5.1 Key Features of the Web-Based Platform

It is important for test administrators to understand how participants complete an online assessment, be able to address questions or concerns participants may raise, and use test administrator tools. To address these issues, HAS trains administrators in the functionality of the system by Hogan. In the initial training session, an administrator is instructed on how to create participant ID's as well as how to use various other tools on the administrative website. Additional training is available for the creation of participant groups, obtaining reports, changing report options, and specifying report delivery options.

HAS' testing system is fully redundant, using a multi-location systems architecture ensuring its constant availability. Clients can access the testing platform 24 hours a day, 7 days a week, from any internet-capable PC. Test results are normally delivered in 90 seconds or less, making results nearly instantaneous. Results are provided to the client via the web or through e-mail as an attached encrypted PDF file. HAS consults with outside security experts to ensure data security; HAS uses 128 bit secure access via password protection when safe guarding clients' and user assessment data.

All HAS web ordering systems allow HAS to tailor the ordering and reporting experience to each user based on a hierarchical system of client and user preferences. Users can select from a wide variety of HDS report options including: simple graphic reports, data reports, individual reports, group-level reports, and specialty reports.

Whether a client orders from a single office or numerous locations, all orders can flow through a single account. HAS product-level security features allow clients to restrict individual user's ability to order and view reports on a product-by-product basis.

## 5.2 Completing the HDS Using the Online Internet System

This section provides an example of the participant experince when completing the HDS online. Testing time for the HDS requires approximately twenty minutes, but may vary depending on the test taker's reading speed.

Once a participant receives a User ID from the administrator, he/she logs into the specified website. This is http://www.gotohogan.com/participant or a customized portal designed for Hogan clients. To logon to the website, a minimum version of Microsoft Internet Explorer 4.0 or Netscape Navigator 6.2 is needed. Once at the website, the individual sees a login page similar to the one in Figure 5.1.

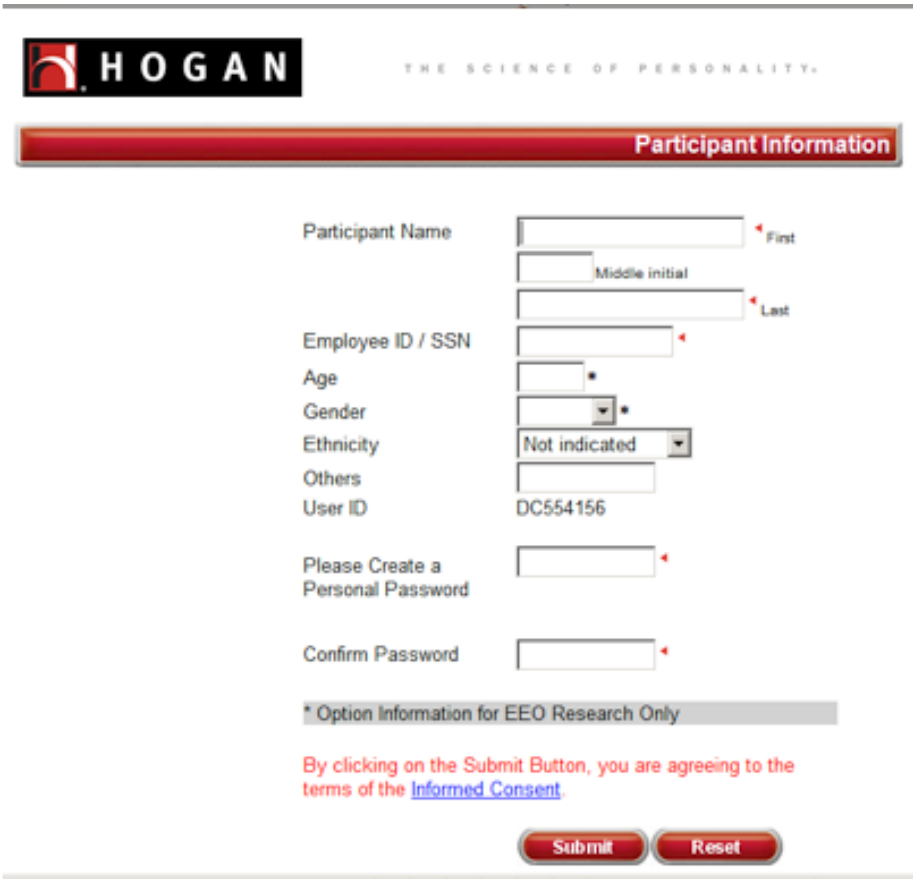
Figure 5.1
Hogan Assessment Systems Participant Login Web Page

At the login page, the participant is asked to enter his/her assigned User ID and password (e.g., User ID: BB123456; Password = SAMPLE) and then select the Logon button.

The participant is prompted to fill out a brief demographics page (see Figure 5.2) and agree to an informed consent clause (see section 5.3). This clause outlines information regarding the purpose, administration, and results of the assessments.

On the Participant Information web page, the participant can insert a string of numbers when asked to input his/her Employee ID or SSN. An administrator may choose to have the individual enter his/her actual social security number, but for privacy reasons we suggest using an ID designed for internal tracking purposes, such as an Employee ID number. Once the user has logged into the system, he/she will be asked to create a personal password and complete additional demographic information. When all of the required fields are complete, the participant must select Submit to continue.

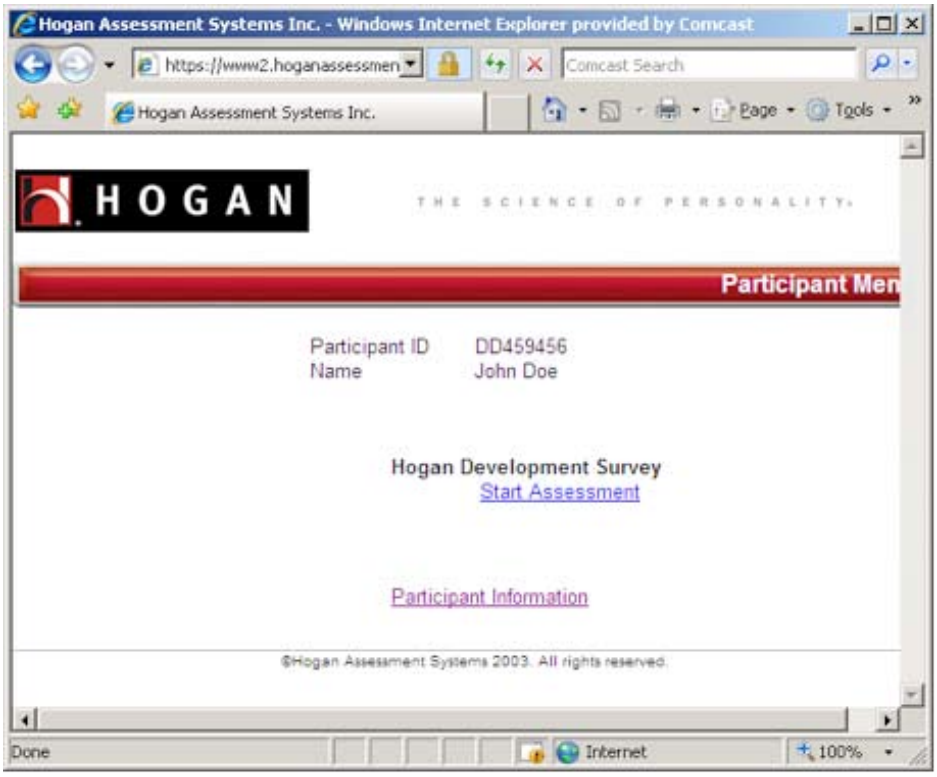
Figure 5.2
Hogan Assessment Systems Participant Information Web Page




After clicking the Submit button, the user is redirected to the Participant Menu. The Participant Menu displays each assessment they are assigned to take (see figure 5.3). If the individual is taking multiple assessments, each will be listed. After an assessment is completed, the individual is returned to this menu to select and proceed with additional assessments until all assigned are completed.

It is important that the administrator emphasize the need to respond to every question. If more than 1/3 of the items on any scale are not answered, the report will be invalid. The participant should not spend too much time on any one specific statement; there are no “right” or “wrong” answers. The participant can navigate forward and backward through the assessment. He/she may select the Next button to continue the assessment; the Previous button permits viewing the previous page. Because the assessment does not time out, the participant can stop and start the assessment at will. If at anytime the individual discontinues the assessment, all prior submitted information will be retained. The participant can log back into the system with his/her User ID

Figure 5.3
Hogan Assessment Systems Participant Menu Web Page




and self-created personal password to continue at any time. Once completed, the assessment is submitted by the participant. Results are processed through a scoring engine that generates and sends the report to an e-mail address(es) designated by the administrator. A sample of an Assessment Questionnaire web page is presented in Figure 5.4.

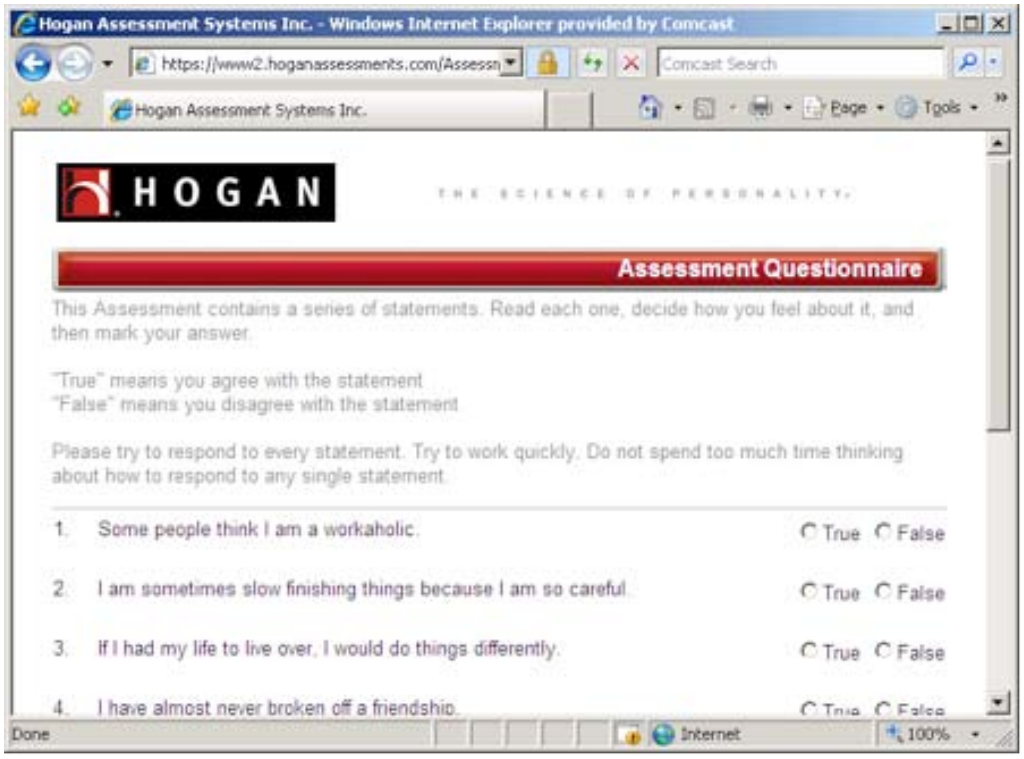
If the account administrator or the participant experiences a problem, they are encouraged to contact HAS' Customer Service Department at 1-800-756-0632 or customerservice@hoganassessments.com.

## 5.3 Participant's Informed Consent

HAS operates under the assumption that all individuals who take assessments have given their informed consent to participate in the assessment process. This is the fundamental concept that underlies all current and anticipated data protection protocols and legislation. In order for individuals taking the assessments to give their informed consent, they must understand the purpose of the assessment, the likely use of the assessment data, and how the data are protected. These protocols are described below and are binding on all HAS clients and individuals taking the assessments. Failure to comply with any of these safeguards will constitute grounds

for termination of any data transfer arrangements between HAS and the person(s) or entity(ies) concerned. The Candidate Log-on Entry protocol requires all individuals taking the assessment to give their informed consent before they can complete the assessment process.

Figure 5.4
Hogan Assessment Systems Questionnaire Assessment Web Page




*Purpose.* The assessments on the website were created to provide personal characteristic information and feedback to trained and accredited consultants and HR professionals. These data are primarily used for selection and/or development.

*Data Use and Storage.* The assessment data will only be used by trained and accredited consultants or HR professionals. HAS will retain individual raw data for a period of three years and, in addition, will use anonymously held (identifying information removed) aggregated data for normative studies. All HAS clients are responsible for complying with national and international protocols covering data use and storage.

*Access to Data.* HAS will not provide results directly to individuals taking the assessments. The dissemination of results is the sole responsibility of the requesting organization. Individuals taking the assessments are not guaranteed access to their individual results.

*Primary Security.* In order to safeguard individual results, the website contains only the assessment items, not the assessment programs (which are held by HAS and its clients). It is impossible to process results through

the website. Results can only be processed by downloading the raw data, decrypting the raw data, and scoring these data with appropriate programs. Until that time, responses to assessment items are merely encrypted alphanumeric strings with no discernible meaning.

*Secondary Security.* Individuals taking the assessments are provided a username and password to access the website assessments. In addition, the raw data are encrypted. Each organization using the website is provided with a secure method of data transfer from the internet to their organization.

## 5.4 Using International Translations of the HDS

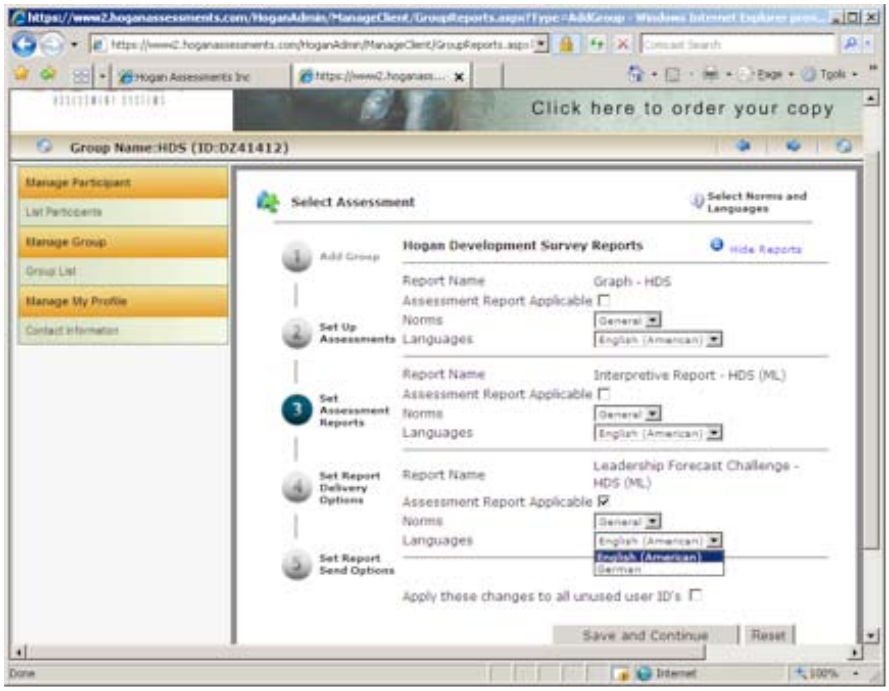
As publisher, HAS undertakes translation and localization initiatives to brand and make available its assessment tools internationally. HDS translations can be accessed in thirty-five languages. Additional translations are completed as needed. A list of current language availability appears in Table 5.1.

Table 5.1
HDS Language Translations

| **Translations/Adaptations Available Online** | |
|---|---|
| Czech (CS) | South African (AE) |
| French Canadian (FC) | Kenya (KE) |
| French Parisian (FR) | Bahasa (BM) |
| German (GR) | Japanese (JA) |
| Slovak (SK) | Korean (KO) |
| Spanish (ES) | Icelandic (IS) |
| Castilian Spanish (CA) | New Zealand English |
| Brazilian Portuguese (BP) | Simplified Chinese (ZH) |
| Danish (DA) | Traditional Chinese (ZC) |
| Turkish (TR) | Polish (PL) |
| UK English (UK) | Russian (RU) |
| US English (US) | Finnish (FI) |
| Italian (IT) | Romanian (RO) |
| Swedish (SV) | Bulgarian (BG) |
| Dutch (NL) | Thai (TH) |
| Norwegian (NO) | Australian (AU) |
| Indian (IN) | Greek English (GE) |
| Greek (EL) | |

Translations of the HDS are administered through the HAS web based assessment platform. The administrator can choose to assess participants in multiple languages and also choose to produce HDS reports in various languages. HDS report translations are selected when the User ID is generated from the online system, as illustrated in Figure 5.5

Figure 5.5
Hogan Assessment Systems Report Language Selection




After creating a participant's online User ID for the desired report language, the administrator directs the participant to the Hogan multi-language assessment website, www.gotohogan.com/mlparticipant. To logon to the website, a minimum version of Microsoft Internet Explorer 4.0 or Netscape Navigator 6.2 is needed. Once the participant logs on to the website, he/she may choose to take the HDS in any of the languages represented by the country flags illustrated in Figure 5.6 by selecting the flag. Then, the login page will appear in the chosen language and the participant is asked to enter his/her assigned User ID and password (e.g., User ID BB123456, Password = SAMPLE) and select the Logon button. The participant is prompted to fill out a brief demographics page and agree to an informed consent clause (see Section 5.3).

Figure 5.6

Hogan Assessment Systems Language Translation Flags

On the Participant Information web page, the participant can insert any string of numbers when asked to input his/her SSN or Employee ID number. Some countries do not use a SSN or have legislation prohibiting the collection of this information. In these cases, the participant should be told what to input into this field by his/her administrator. An administrator may select to have the participant enter his/her Employee ID, User ID, or a company assigned ID designed for internal tracking purposes. The system requests that the participant create a personal password. This becomes the participant's new password for logging out and back into the system. Once all fields on the Participant Information page are complete, the participant selects Submit to continue (see Figure 5.7).

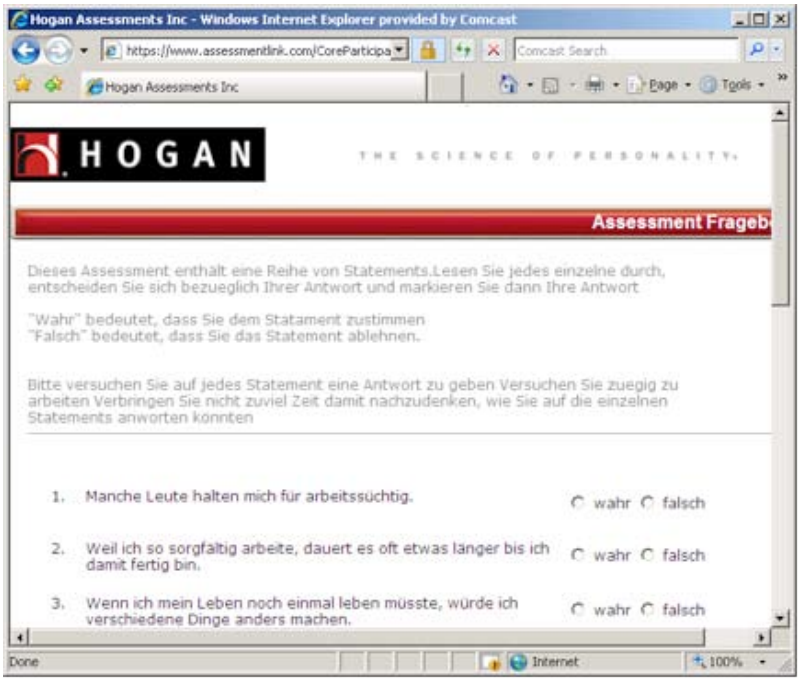
Figure 5.7

Hogan Assessment Systems Participant Information Page

The participant is ready to start the assessment. Figure 5.8 shows the Participant Menu web page. If the participant is set up to take multiple assessments, each will be listed in the Participant Menu. The participant selects the assessment from the Participant Menu and the assessment is delivered in the desired language chosen earlier from the Hogan Multi-Language test administration website (e.g., Figure 5.9).

Figure 5.8
Hogan Assessment Systems Participant Menu

Figure 5.9
Hogan Assessment Systems Multilanguage Questionnaire Example Web



## 5.5 Accommodating Individuals with Disabilities

The Americans with Disabilities Act of 1990 (ADA) is the most significant, recent employment law that addresses employers' requirements for fair treatment of disabled individuals. It prohibits discrimination against qualified individuals with disabilities in employment. This law has important implications for employers' procedures used in interviewing, testing, and hiring new employees. For pre-employment testing, the ADA specifies that employers must provide alternate forms of employment testing that "accurately (assess) the skills, aptitudes, or whatever other factor of such applicant or employee that such test purports to measure, rather than reflecting the impaired sensory, manual or speaking skills of such employee or applicant" Sec. 102(b)(7), 42 U.S.C.A.Sec. 12112. HAS complies with the ADA requirements by working with clients to accommodate individuals with special needs. Large print assessments and screen readers are available from customer service at 1-800-756-0632 or customerservice@hoganassessments.com. In addition, because the HDS is not a timed test, individuals can take as much time as they need to complete the assessment. HAS can make additional accommodations on a case by case basis through contacting customer service.

## 5.6 Frequently Asked Questions

The following are questions participants ask frequently, followed by answers typically given by customer service staff:

Q. I am trying to sign back in to complete the assessments but my user id and password are not working.
A. Please use the new personal password you created when you first accessed the system. (You were requested to change the password on the initial participant information screen).

Q. Can I stop the assessment at any time?
A. Yes, you can select the stop assessment link to end your session. Please make note of your User ID and new personal password in order to log back into the website.

Q. How long will the assessments take?
A. Please allow 15 to 20 minutes to complete the assessment.

Q. Is it a timed assessment?
A. No, you can take as much time as needed to complete the inventory.

Q. Will I receive a copy of my results?
A. We are not at liberty to share or discuss results with candidates. Results are sent to the company that requested your assessments; the company decides whether or not to share results with you.

Q. Will all my data be lost because my system locked up before I completed the assessment?

A. No, your responses are saved after each page is completed.

## 5.7 Alternative Testing Solutions

Although HAS encourages the use of online testing systems, not all assessment situations are conducive to computerized testing formats. HAS can provide paper-and-pencil assessment materials for the HDS. For test security, inventory scores for the HDS are generated by HAS. To calculate the scores, clients must provide answer sheets back by fax or mail for scoring. Alternatively, clients may provide computerized item-level data files back to HAS for scoring. The appropriate data file formats are available by contacting Customer Service at 1-800-756-0632 or customerservice@hoganassessments.com.

# 6. COMPILATION OF NORMS

## 6.1 Importance of Norms for Interpretation and Decision-Making

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

### 6.1.1 Presentation of Normative Data

Assessment providers use a variety of formats to present normative data. However, three formats are most prevalent: (a) raw scale scores, (b) standardized scores, or (c) percentile ranks (Nunnally, 1967). Although raw scale scores directly link to the assessment, they are difficult to interpret because different assessments and scales have differing total possible scores. For example, a raw scale score of "8" is difficult to interpret because the total possible score could be 10, 50, 100, 1000, or any other score. Depending on the total possible score, one would interpret a raw scale score of "8" in vastly different lights.

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

Unlike the two methods previously described, the HDS manual (R. Hogan & Hogan, 1997) specifies that the HDS be interpreted using percentile ranks. Percentile ranks represent an alternative to standardized scores. Like standardized scores, percentiles place an individual's raw scale score on a ranking metric where users can compare one person's scores against others' scores. However, unlike standardized scores with ranges of -3 to +3 (z-scores), 20 to 80 (T-scores), or 1 to 10 (Sten scores), percentile ranks use a 0 – 100% range, most commonly understood and easily interpreted by the general public. For example, a raw Excitable scale score may correspond to a z-score of 1.1. However, it is difficult to interpret this standardized score. That same scale score may correspond to a percentile score of 85%, facilitating the easy interpretation that this person scores above 85% of others on that scale.

### 6.1.2 Professional Standards for Norm Development

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

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

Considering the above discussion, Hogan developed and presents normative data for the HDS using an extensive normative sample based on the intended use of the HDS among the Hogan client base. In addition, we divided these norms by occupational and demographic variables of interest. Using percentile ranks, these normative data are easily interpretable, facilitating decision-making in applied personnel contexts. As discussed in subsequent sections of this chapter, these considerations ensure that norms provided for the HDS adhere to existing professional guidelines and Cronbach's (1984) standards described above. The remainder of this chapter describes the process of developing normative data for the HDS, satisfying the requirement previously outlined by the *Standards for Educational and Psychological Testing* (1999).

## 6.2 Updating Norms for the 2008 HDS

Hogan uses the HDS primarily as a developmental assessment for providing working adults with "strategic self-awareness" about potentially derailing personality characteristics that may emerge during periods of high stress and/or low vigilance. However after empirical validation, Hogan also uses the HDS as a selection assessment for jobs where the negative consequences of these derailing characteristics could have consequential effects. Across these applications, the target population of the HDS remains the same – "high impact jobs." That is, the HDS is most useful for those jobs where the effects of an individual's derailing personality characteristics have the most negative outcomes and consequences. These groups include those in positions of authority (i.e., managers and executives), expert employees with responsibilities to others (i.e., professionals), those interacting frequently with customers or clients (i.e., sales and customer support), and those provid-

ing protective, security, and other public services (i.e., service and support). Although the HDS is used across the entire U.S. workforce, these four groups provide the core development and selection applications of the HDS. As such, these four occupational groups represent the samples to establish and maintain normative data for interpretation and decision-making.

It is common for authors and publishers to invest considerable resources on norming during initial assessment development. However, it is less common for them to devote similar levels of organizational resources to *maintain* and *update* those norms after they are established. In our view, this is unfortunate because there is a professional responsibility to develop and maintain relevant norms.

Existing norms may require maintenance and/or updates for many reasons, but five key factors may significantly influence existing norms and signal a need for their evaluation, revision, and/or replacement:

1. Samples used to calculate existing norms may become outdated
2. New respondents may be more familiar with the assessment than previous respondents
3. Individuals and groups asked to contribute to normative samples may change
4. The purpose and/or application of the assessment may change
5. Representation of the norming samples may change with demographic/occupational shifts

Due to these and other changes, assessment providers should monitor, maintain, and update their norms when they observe the above-described conditions. Unfortunately, some assessments require renorming more often than others, no universal guidance is available on the frequency for updating norms. However, if normative data are to serve their intended purpose of providing an accurate context for score interpretation, assessment providers should occasionally recalibrate the frames of reference for their products. In fact, the 1999 *Standards for Educational and Psychological Testing* reiterates this point, stating in Standard 4.18:

> *If a publisher provides norms for use in test score interpretation, then so long as the test remains in print, it is the publisher's responsibility to assure that the test is renormed with sufficient frequency to permit continued accurate and appropriate score interpretations.*

Due to this professional responsibility, Hogan investigated the score distributions for all HDS scales in early 2008. Relative to the first publication of HDS norms in 1997 and second edition norms published in 2002, we noted in this research that the score distributions for all HDS scales changed slightly. Consequently, the value of prior normative data for selection and development applications is restricted. For example, in a selection context, selection cutoff scores based on the prior norms would no longer result in the same balanced pass rates observed in earlier years. Likewise, in the context of personnel development, using prior norms might slightly distort interpretive information such as feedback because a raw scale score may not be associated with the same normative percentile rank previously recorded. For these reasons, Hogan decided to update the HDS norms to ensure the accuracy and timeliness of the data providing a basis for interpretation and subsequent decision-making.

To develop a comprehensive sampling strategy for updating the HDS norms, we identified stratification variables. These variables served as criteria to ensure that the new HDS norms achieve proportionate representation of respondents across these groups. We identified five key stratification variables that guided the development of the new HDS norms. We describe each of these concepts in further detail below.

1. Job Families
2. Application of Data
3. Ethnicity
4. Gender
5. Age

### 6.2.1 Job Families

Job families represent clusters of occupations grouped together based on the similarity of work performed, skills, education, training, and other credentials required for successful job performance. Hogan derived the seven job families, identified as the first stratification variable, from nine "job classifications" used by the Equal Employment Opportunity Commission (EEOC) for U.S. employers. Hogan uses this occupational system for two main reasons: (a) a large percentage of U.S. employers are familiar with the EEOC job classification system, and (b) the job classifications are conceptually clear and easy to use as a stratification variable.

Table 6.1 presents the seven Hogan job families, as well as the U.S. Department of Labor's (DoL) job categories included in each job family. The U.S. Department of Labor developed these job categories in response to a growing need for an occupational classification system to classify all jobs within the U.S. workforce (U.S. Department of Labor, 1991). As such, Table 6.1 represents a crosswalk that Hogan clients and other users can reference to find the Hogan job family corresponding with many jobs in the United States economy.

Table 6.1

Hogan Job Family Structure with Department of Labor Job Categories

| Hogan Job Family | Description | DoL Job Category |
|---|---|---|
| Managers & Executives | Employees assigned to positions of administrative or managerial authority over the human, physical, and financial resources of the organization. | Management Occupations |
| Professionals | Employees with little legitimate authority, but high status within the organization because of the knowledge and/or skills they possess. These employees are usually experts with a broad educational background, and rely primarily on their knowledge and intellect to perform their duties. | Architecture and Engineering Occupations<br>Arts, Design, Entertainment, Sports, and Media Occupations<br>Business and Financial Operations Occupations<br>Community and Social Service Occupations<br>Education, Training, and Library Occupations<br>Health Practitioners and Technical Occupations<br>Legal Occupations<br>Life, Physical, and Social Science Occupations |
| Technicians & Specialists | Employees who rely on the application of highly specific knowledge in skilled manipulation (e.g., operation, repair, cleaning, and/or preparation) of specialized technology, tools, and/or machinery. | Installation, Maintenance, and Repair Occupations<br>Computer and Mathematical Occupations |
| Operations & Trades | Craft workers (skilled), operatives (semi-skilled), and laborers (unskilled) whose job knowledge and skills are primarily gained through on-the-job training and experience; little pre-requisite knowledge or skill is needed. | Building and Grounds Cleaning and Maintenance Occupations<br>Construction and Extraction Occupations<br>Farming, Fishing, and Forestry Occupations<br>Military Specific Production Occupations<br>Transportation and Material Moving Occupations |
| Sales & Customer Support | Employees who use appropriate interpersonal style and communication techniques to establish relationships, sell products or services that fulfill customers' needs, and provide courteous and helpful service to customers after the sale. | Sales and Related Occupations |

Table 6.1 (Cont.)
Hogan Job Family Structure with Department of Labor Job Categories

| Hogan Job Family | Description | DoL Job Category |
|---|---|---|
| Administrative & Clerical | Employees who plan, direct, or coordinate supportive services of an organization. The main function of these employees is to facilitate the function of professionals by completing jobs that require little formal education or skills to complete (e.g., professional assistants, secretaries, clerks) | Healthcare Support Occupations<br>Office and Administrative Support Occupations |
| Service & Support | Employees that perform protective services for individuals and communities (e.g., police, firefighters, guards) and non-protective services for individuals that require little or no formal training but a high degree of interaction with people (e.g., food service, recreation and amusement). | Food Preparation and Serving Related Occupations<br>Personal Care and Service Occupations<br>Protective Service Occupations |

As previously described, the target population of the HDS includes four of the job families described above: (a) Managers and Executives, (b) Professionals, (c) Sales and Customer Support, and (d) Service and Support. Therefore, in developing the 2008 HDS norms, Hogan sought to maximize representation of those four key job families. However, we also sought out data for the other three job families to ensure that the HDS norms represented all jobs across the broad spectrum of the U.S. economy. These criteria guided the first level of data stratification during development of the 2008 HDS norms.

### 6.2.2 Application of Data

Because the HDS is used for both development and selection applications, Hogan balanced representation of the inventory data across these contexts. Specifically, we initially considered development cases with an approximately equal number of selection cases. However, we also intended to enhance the representation of development cases, because clients primarily use the HDS for such purposes. As a result, cases included in the HDS normative dataset would be required to represent the U.S. workforce in terms of job families, and reflect the application of the data as used by Hogan's client base using an internet delivery platform. The first two stratification levels ensured that the 2008 HDS norms would account for various applications of the data across the U.S. workforce, with emphasis on development and the target populations described previously.

### 6.2.3 Ethnicity

To ensure that the updated HDS norms would represent respondents across various ethnic groups, we included ethnicity as a primary demographic stratification variable. We sought to identify cases of HDS data available for respondents across multiple demographic categories. Consistent with forms used by the Equal Employment Opportunity Commission's (EEOC, 2006) Office of Management and Budget (OMB) to collect federal data on race and ethnicity in the workplace, we included five racial categories: (a) American Indian or Alaska Native, (b) Asian, (c) Black or African-American, (d) Native Hawaiian or Other Pacific Islander, and (e) White; one ethnic category, (f) Hispanic or Latino, is also included in this effort. However, in an environment where an increasing number of individuals include themselves with more than one racial or ethnic group, we also aimed to identify cases of HDS data where respondents identified with (g) Two or More Races.

In sum, we sought to locate cases of available HDS data representing the above seven racial and ethnic groups. We intended for the representation of these cases to approximate those found in the U.S. working population. To enhance the total number of cases in the normative dataset, we allowed for the inclusion of an appropriate number of cases with race and/or ethnicity data missing.

### 6.2.4 Gender

Gender represented our second demographic stratification variable. Similar to ethnicity stratification, we used federal laws and guidelines from the EEOC to ensure proportionate representation of both genders in the 2008 normative HDS data. Specifically, we sought to identify cases of available HDS data completed by men and women, and include proportionate numbers of male cases and female cases in the normative dataset. We intended to approximate the representation of men and women found in the U.S. working population. To enhance the total number of cases in the normative dataset, we allowed for the inclusion of an appropriate number of cases with missing gender data.

### 6.2.5 Age

As a third and final demographic stratification variable, we attempted to locate a representative sample of HDS respondents across age groups. Consistent with the Age Discrimination in Employment Act of 1967 (ADEA; Lindemann & Grossman, 1996), our intent was to include proportionate numbers of data from respondents who were under 40 years of age when they completed the HDS, as well as respondents 40 years of age or older. We sought to reflect the levels of these groups found in the U.S. working population. As with ethnicity and gender, we allowed for the inclusion of cases with missing age data to enhance the total number of cases in the normative dataset.

Our sampling strategy in the compilation of 2008 HDS norms identified cases for inclusion that simultaneously satisfied the requirements of two occupational variables (i.e., job family, application of data) and three demo-

graphic variables (i.e., ethnicity, gender, age). By proportionately sampling representative cases from these groups, we ensured that cases included in the normative sample represent:

- All job familes across the U.S. workforce, with emphasis on specific target populations of: (a) Managers and Executives, (b) Professionals, (c) Sales and Customer Support, and (d) Service and Support.

- Both selection and development applications of HDS data. Consistent with the primary application of the HDS, additional cases enhance the representation of development cases. The representation of these cases reflects the Hogan client base using an internet delivery platform.

- All seven racial/ethnic groups identified by EEOC (1978) guidelines: (a) American Indian or Alaska Native, (b) Asian, (c) Black or African-American, (d) Native Hawaiian or Other Pacific Islander, (e) White, (f) Hispanic or Latino, and (g) Two or More Races. The proportionate representation of these groups approximates those levels found in the U.S. working population.

- Both men and women, approximating those levels found in the U.S. working population.

- Two age groups: a) Under 40 years, and b) Age 40 and over. The proportionate representation of these groups approximates those levels found in the U.S. working population.

Driven by our professional responsibility to maintain accurate and current norms, and guided by our five key variables of interest along with the record keeping guidelines outlined by the EEOC (1978), we identified samples from the Hogan data warehouse. We next describe this sampling process.

## 6.3 Stratified Sampling of the Norming Population

### 6.3.1 Initial Population

Using the sampling plan described above, we drew representative samples from the Hogan data warehouse. We included data collected on-line between February 26, 2003 and February 2, 2008 in this initial population. We included cases from each of the Hogan job families previously described, with emphasis placed on Managers and Executives, Professionals, Sales and Customer Support, and Service and Support job families as a large preliminary “population” of the HDS. Additionally, we included both selection and development cases from each job family to maximize representation across applications of the data. Using as many cases of selection and development data as possible, we ensured that we could eliminate cases as needed to balance representation for both applications of HDS data.

After including sufficient cases to account for occupational stratification variables (i.e., Hogan job family, selection or development application of data), we obtained population estimates from the U.S. Census Bureau's American FactFinder (2006) program to specify general demographic characteristics for the normative database. Specifically, we used the latest population estimates available, collected in July 2006, to determine the current representation rates of various age, gender, and ethnic groups in the U.S. population. We then used these percentages as guidelines to determine the proportionate representation of each group in the HDS normative database.

This effort to maximize representation across occupational and demographic variables resulted in an initial Hogan archived population N = 529,235.

### 6.3.2 Elimination of Cases

*Missing Data.* From the initial population of 529,235, we eliminated cases to achieve the sampling goals previously outlined. First, we removed all cases with excessive *missing data*. For each 14-item scale in the HDS, we define "excessive" missing data as six or more missing items. In other words, a respondent must answer nine or more items on each scale (64.29% or more) for the scale to be valid for scoring. Consistent with this logic, we eliminated all cases where respondents answered less than 64.29% of the 168 total items. By applying this rule, we excluded all cases with 61 or more missing items from the norming sample.

*Occupational Data.* Once we eliminated cases with excessive missing data, we moved to balance representation across occupational groups. We expected to find differences between certain occupational groups in the HDS archival data as compared to the U.S. workforce. For example, we expected that the normative data would contain relatively few cases of data for Administrative and Clerical jobs, as the Hogan client base does not use the HDS as often for these jobs as for other job families. To control for these differences, but maintain appropriate levels of representation across all job families given the Hogan client base, we maximized representation of non-target job families (i.e., Technicians and Specialists, Operations and Trades, Administrative and Clerical) by including all cases of HDS data identified for those groups. For the target job families (i.e., Managers and Executives, Professionals, Sales and Customer Support, Service and Support), we determined the number of cases needed from the HDS archival data set to proportionately represent that group and properly balance other stratification variables of interest. In sum, compared to the U.S. workforce, some occupations were under-represented in the HDS archival data and others were over-represented. In other words, the current HDS archival data set reflects the intended usage and target populations of the HDS among the Hogan client base, and there are expected differences between the client base and representation of the total U.S. workforce.

Compared to other target job families, the Service and Support category showed the largest over-representation. As such, we used this category as the starting point for reducing the normative sample by occupational groups. However, we had to select cases of HDS data carefully from this job family to eliminate to ensure that other stratification variables (i.e., age, gender, ethnicity) remained properly balanced. Given these constraints,

we first eliminated 71,155 cases from this job family where respondents did not indicate their age, gender, or ethnicity. Next, we eliminated 325,232 cases from this job family where respondents were from over-represented age, gender, and ethnic groups. These procedures eliminated 396,387 excess cases, brought the Service and Support category down to appropriate levels of representation, and ensured that reductions in this job family would not adversely affect demographic stratification variables.

After balancing representation in the Service and Support job family, we found it necessary to eliminate additional cases from two of the other three HDS target populations – Managers and Executives and Professionals. We began by eliminating 6,000 cases of data from the Managers and Executives job family where respondents were from over-represented age, gender, and ethnic groups. We eliminated an additional 4,480 similar cases of data from the Professionals job family. Finally, we eliminated 651 cases where job family data were unavailable and respondents were from over-represented demographic groups. These steps balanced the representation of all target and non-target occupational groups and reduced the norming sample from 529,235 to 121,717. The final normative sample by occupational designation appears in Table 6.2. To reflect the Hogan client base and balance demographic characteristics (i.e., age, gender, ethnicity), 11,291 cases with unknown occupational categories remained in the norming sample.

*Assessment Purpose.* To achieve our goal of balancing selection and development cases, we found it necessary to eliminate over-represented cases of selection data. After eliminating the above-described occupational data, a slight over-representation of selection cases still remained in the normative sample. To correct this situation, we eliminated 12,614 cases of selection data where respondents either did not identify their age, gender, or ethnic group or were from over-represented demographic groups. The final distribution of selection and development cases appears in Table 6.3. To enhance the representation of development cases in the norming sample, 7,405 unclassified cases remained in the norming sample. A total of 109,103 cases of data comprise the HDS normative sample.

Table 6.2
Norming Sample Distribution by Hogan Job Family

| Hogan Job Family | Number | Percent |
|---|---|---|
| Managers & Executives | 46,135 | 42.3 |
| Professionals | 14,344 | 13.1 |
| Technicians & Specialists | 147 | 0.1 |
| Operations & Trades | 168 | 0.2 |
| Sales & Customer Support | 1,594 | 1.5 |
| Administrative & Clerical | 116 | 0.1 |
| Service & Support | 35,308 | 32.4 |
| Unknown | 11,291 | 10.3 |
| TOTAL | 109,103 | 100.0 |

Table 6.3
Norming Sample Distribution by Assessment Purpose

| Assessment Purpose | Number of Cases | Percent of Final Sample |
|---|---|---|
| Selection | 50,800 | 46.6 |
| Development | 50,898 | 46.7 |
| Unknown | 7,405 | 6.8 |
| TOTAL | 109,103 | 100.0 |

## 6.4 Demographics of the Norming Sample

The final norming sample included 109,103 cases representing various occupational groups within the U.S. workforce. To guide our efforts to specify general demographic characteristics in the normative sample, we obtained population estimates from the U.S. Census Bureau's American FactFinder program. As previously described, we used population estimates collected in July 2006 to determine the percentages of various age, gender, and ethnic groups in the U.S. working population. We then used these percentages as guidelines when eliminating cases to ensure that the final norming sample mirrored population demographics as closely as possible. Age, gender, and ethnicity distributions in the final norming sample appear below in Tables 6.4, 6.5, and 6.6, respectively. Table 6.7 provides a more detailed breakdown of age, gender, and ethnicity variables in the normative sample.

Table 6.4
Age Distribution of the Final Norming Sample

| Age | Number of Cases | Percent of Sample | Percent in Population |
|---|---|---|---|
| Under 40 | 35,841 | 32.9 | 42.3 |
| 40 and Over | 34,647 | 31.8 | 37.4 |
| Not Indicated | 38,615 | 35.4 | 20.3 |
| TOTAL | 109,103 | 100.0 | 100.0 |

As Table 6.4 indicates, the normative sample includes a proper balance of respondents across both age groups. Although a significant number of cases with missing age data were included, these cases were necessary to represent other valued occupational and demographic stratification variables. Of particular importance in this table is the fact that the rank-ordering of, and ratio between, both age groups in the normative sample are consistent with that found in the U.S. working population.

Table 6.5
Gender Distribution of the Final Norming Sample

| Gender | Number of Cases | Percent of Sample | Percent in Population |
|---|---|---|---|
| Male | 54,414 | 49.9 | 48.6 |
| Female | 52,723 | 48.3 | 51.4 |
| Not Indicated | 1,966 | 1.8 | N/A |
| TOTAL | 109,103 | 100.0 | 100.0 |

As illustrated in Table 6.5, nearly equal cases of males and females comprise the normative sample. Although the normative sample reversed the rank-ordering of males to females from that found in the U.S. working population, the rank-ordering in the normative sample more closely represents the usage of the HDS in the Hogan client base. More importantly, this change in rank ordering does not involve a significant departure from the gender distribution in the U.S. workforce. Some cases with missing gender data were also included to account for other valued occupational and demographic stratification variables.

Table 6.6
Race/Ethnicity Distribution of Final Norming Sample

| Ethnicity | Number of Cases | Percent of Sample | Percent in Population |
|---|---|---|---|
| Two or More Races | 121 | 0.1 | 1.6 |
| Black/African American | 12,696 | 11.6 | 12.8 |
| Hispanic/Latino | 13,901 | 12.7 | 14.8 |
| Asian | 3,846 | 3.5 | 4.4 |
| American Indian/Alaska Native | 3,016 | 2.8 | 1.0 |
| White | 47,286 | 43.3 | 65.2 |
| Not Indicated | 28,160 | 25.8 | N/A |
| Native Hawaiian/Other Pacific Islander | 77 | 0.1 | 0.2 |
| TOTAL | 109,103 | 100.0 | 100.0 |

As with Tables 6.4 and 6.5, Table 6.6 illustrates that the ethnic composition of the normative sample closely matches that of the U.S. working population. Although the “American Indian/Alaska Native” category over-represents the percentage of that ethnic group in the U.S. workforce, these cases were included to account for other valued occupational and demographic stratification variables. Respondents identifying themselves as belonging to “Two or More Races” slightly under-represent the domestic workforce, but we included all cases from this group tor maximize representation. Excluding the cases where respondents did not provide data, the rank ordering of samples of ethnic groups in the normative database follows that found in the U.S. working population. Cases with missing ethnicity data also were included to account for other valued occupational and demographic stratification variables.

Table 6.7
Norming Sample Ethnic Composition by Age and Gender

| Age in Years | Under 40 | | 40 and Over | | Not Indicated | |
|---|---|---|---|---|---|---|
| **Gender** | **M** | **F** | **M** | **F** | **M** | **F** |
| Two or More Races | 36 | 25 | 45 | 10 | 1 | 4 |
| Black/African American | 2,391 | 5,755 | 2,669 | 1,667 | 89 | 121 |
| Hispanic/Latino | 3,474 | 2,570 | 2,164 | 713 | 486 | 4,492 |
| Asian | 881 | 1,140 | 916 | 343 | 81 | 461 |
| American Indian/Alaska Native | 29 | 25 | 44 | 31 | 1,709 | 1,178 |
| White | 8,639 | 9,071 | 13,705 | 10,188 | 783 | 4,887 |
| Not Indicated | 970 | 787 | 1,349 | 769 | 13,916 | 8,446 |
| Native Hawaiian/Pac. Islander | 23 | 25 | 14 | 13 | 0 | 2 |
| TOTAL | 16,443 | 19,398 | 20,906 | 13,734 | 17,065 | 19,591 |

As Table 6.7 illustrates, although differences exist within each ethnic group for the number of respondents in the normative sample by age and gender, approximately equal numbers of cases are included as totals for each age and gender group across ethnicities. Interestingly, male respondents were more likely to indicate their age but not ethnicity, or indicate neither age nor ethnicity. Female respondents, on the other hand, were more likely to indicate their ethnicity, but not their age.

Tables 6.4 through 6.7 demonstrate that the normative sample is representative of all age, gender, and ethnic groups under consideration. Combining this information with the data presented in Tables 6.2 and 6.3, it is apparent that the normative sample represents a broad cross-section of job families (with emphasis on particular target populations), selection and development applications of HDS data, as well as demographic variables of interest in the U.S. workforce.

## 6.5 Descriptive Statistics of the Norming Sample

On the following pages, Tables 6.8 through 6.16 present means and standard deviations for the HDS scales categorized by selected demographic groups. Table 6.8 provides the general structure for all following tables, presenting these data across ethnic groups included in the normative sample. Table 6.9 presents these data for respondents under the age of 40, with Table 6.10 reporting scores for those 40 and over. Tables 6.11 and 6.12 follow the same pattern, presenting scores for males and females, respectively. Finally, Tables 6.13 and 6.14 present data for males and females under age 40, with Tables 6.15 and 6.16 reporting the same data for males and females age 40 and over. Total possible scores for all HDS scales range from 0 to 14. For all tables presented, we computed statistics from the norming sample. Any specific subgroup data can be requested from Hogan. Appendix D contains raw score to percentile conversions for the total sample across all HDS scales.

Table 6.8

Norming Sample Scale Means and Standard Deviations for Ethnic Groups

| Ethnicity | | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|
| *N* | | *121* | *12,696* | *13,901* | *3,846* | *3,016* | *47,286* | *28,160* | *77* | *109,103* |
| EXC | M | 3.40 | 2.87 | 2.88 | 3.12 | 2.40 | 2.76 | 2.73 | 4.99 | 2.79 |
| | SD | 2.84 | 1.87 | 2.03 | 2.43 | 2.30 | 2.25 | 2.46 | 3.33 | 2.25 |
| SKE | M | 4.51 | 4.67 | 4.81 | 5.07 | 5.99 | 3.83 | 4.35 | 6.03 | 4.29 |
| | SD | 3.00 | 2.16 | 2.36 | 2.50 | 2.68 | 2.23 | 2.38 | 2.33 | 2.35 |
| CAU | M | 3.00 | 2.16 | 2.55 | 3.27 | 2.06 | 2.83 | 3.06 | 5.44 | 2.77 |
| | SD | 2.42 | 1.86 | 2.13 | 2.43 | 2.09 | 2.38 | 2.49 | 2.73 | 2.34 |
| RES | M | 4.00 | 4.33 | 4.13 | 4.06 | 4.78 | 3.82 | 4.13 | 5.06 | 4.04 |
| | SD | 1.93 | 1.94 | 1.94 | 2.09 | 2.12 | 1.95 | 2.14 | 2.03 | 2.02 |
| LEI | M | 4.74 | 4.86 | 4.68 | 5.00 | 4.85 | 4.30 | 4.40 | 6.48 | 4.48 |
| | SD | 2.08 | 1.71 | 1.81 | 2.10 | 2.15 | 1.93 | 2.18 | 2.56 | 1.99 |
| BOL | M | 7.31 | 8.34 | 8.25 | 8.24 | 8.08 | 7.10 | 7.63 | 8.29 | 7.60 |
| | SD | 3.04 | 2.45 | 2.63 | 2.75 | 2.46 | 2.64 | 2.60 | 2.89 | 2.66 |
| MIS | M | 5.93 | 5.08 | 5.26 | 5.76 | 8.38 | 5.40 | 6.23 | 6.16 | 5.65 |
| | SD | 2.94 | 2.32 | 2.37 | 2.57 | 2.58 | 2.54 | 2.50 | 2.63 | 2.56 |
| COL | M | 7.28 | 7.13 | 6.95 | 7.10 | 8.13 | 7.16 | 7.67 | 7.17 | 7.29 |
| | SD | 2.99 | 2.37 | 2.53 | 2.85 | 2.57 | 2.78 | 2.86 | 2.60 | 2.74 |
| IMA | M | 6.31 | 5.22 | 5.37 | 6.05 | 6.83 | 5.03 | 5.62 | 6.97 | 5.34 |
| | SD | 2.78 | 2.40 | 2.43 | 2.51 | 2.50 | 2.42 | 2.44 | 2.80 | 2.46 |
| DIL | M | 9.91 | 10.49 | 10.40 | 10.25 | 9.89 | 9.72 | 9.16 | 9.96 | 9.78 |
| | SD | 2.00 | 1.64 | 1.69 | 2.05 | 2.11 | 2.08 | 2.29 | 2.04 | 2.10 |
| DUT | M | 8.02 | 8.81 | 8.87 | 8.55 | 7.79 | 8.15 | 7.50 | 8.12 | 8.15 |
| | SD | 2.02 | 1.85 | 1.94 | 2.22 | 2.16 | 2.06 | 2.12 | 2.05 | 2.10 |

*Note.* 0 – Two or More Races; 1 – Black or African-American; 2 – Hispanic or Latino; 3 – Asian; 4 – American Indian or Alaska Native; 5 – White; 6 – Not Indicated; 7 – Native Hawaiian or Other Pacific Islander; EXC – Excitable; SKE – Skeptical; CAU – Cautious; RES – Reserved; LEI – Leisurely; BOL – Bold; MIS – Mischievous; COL – Colorful; IMA – Imaginative; DIL – Diligent; DUT – Dutiful

Table 6.9

Norming Sample Scale Means and Standard Deviations for Ethnic Groups Under Age 40

| Ethnicity | | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|
| *N* | | *61* | *8,146* | *6,044* | *2,021* | *54* | *17,710* | *1,757* | *48* | *35,841* |
| EXC | M | 3.69 | 2.77 | 2.54 | 2.96 | 2.98 | 2.71 | 2.80 | 5.67 | 2.72 |
| | SD | 3.17 | 1.85 | 1.80 | 2.38 | 2.72 | 2.28 | 2.73 | 3.48 | 2.15 |
| SKE | M | 5.15 | 4.84 | 4.61 | 5.09 | 4.59 | 4.03 | 4.45 | 6.27 | 4.40 |
| | SD | 2.75 | 2.13 | 2.15 | 2.37 | 2.38 | 2.20 | 2.34 | 2.45 | 2.23 |
| CAU | M | 3.25 | 2.03 | 2.13 | 3.01 | 3.39 | 2.69 | 2.98 | 5.77 | 2.48 |
| | SD | 2.47 | 1.81 | 1.91 | 2.35 | 3.02 | 2.35 | 2.49 | 3.05 | 2.21 |
| RES | M | 4.18 | 4.35 | 3.94 | 4.01 | 4.06 | 3.70 | 4.01 | 4.79 | 3.93 |
| | SD | 2.05 | 1.93 | 1.85 | 1.97 | 2.08 | 1.85 | 2.12 | 1.75 | 1.91 |
| LEI | M | 5.26 | 4.94 | 4.57 | 4.95 | 4.59 | 4.33 | 4.40 | 6.38 | 4.55 |
| | SD | 2.31 | 1.67 | 1.71 | 1.98 | 2.33 | 1.92 | 2.21 | 2.61 | 1.87 |
| BOL | M | 8.25 | 8.61 | 8.32 | 8.29 | 7.74 | 7.36 | 7.67 | 8.42 | 7.88 |
| | SD | 2.55 | 2.36 | 2.54 | 2.66 | 2.59 | 2.61 | 2.58 | 2.80 | 2.60 |
| MIS | M | 6.90 | 5.21 | 5.34 | 5.85 | 6.41 | 5.52 | 6.08 | 6.25 | 5.47 |
| | SD | 2.79 | 2.28 | 2.37 | 2.59 | 2.64 | 2.49 | 2.53 | 2.94 | 2.44 |
| COL | M | 7.95 | 7.36 | 7.25 | 7.32 | 7.81 | 7.43 | 7.62 | 7.42 | 7.39 |
| | SD | 2.91 | 2.28 | 2.48 | 2.79 | 3.14 | 2.72 | 2.89 | 2.66 | 2.60 |
| IMA | M | 7.16 | 5.42 | 5.44 | 6.16 | 5.67 | 5.11 | 5.50 | 7.38 | 5.32 |
| | SD | 2.67 | 2.37 | 2.40 | 2.46 | 2.78 | 2.40 | 2.55 | 2.86 | 2.42 |
| DIL | M | 10.02 | 10.57 | 10.39 | 10.30 | 9.44 | 9.87 | 9.40 | 10.25 | 10.12 |
| | SD | 2.26 | 1.56 | 1.64 | 2.01 | 2.19 | 2.01 | 2.25 | 2.05 | 1.90 |
| DUT | M | 8.21 | 8.98 | 8.88 | 8.69 | 7.70 | 8.33 | 7.84 | 8.54 | 8.57 |
| | SD | 2.26 | 1.79 | 1.88 | 2.14 | 1.73 | 2.04 | 2.13 | 1.98 | 2.00 |

*Note.* 0 – Two or More Races; 1 – Black or African-American; 2 – Hispanic or Latino; 3 – Asian; 4 – American Indian or Alaska Native; 5 – White; 6 – Not Indicated; 7 – Native Hawaiian or Other Pacific Islander; EXC – Excitable; SKE – Skeptical; CAU – Cautious; RES – Reserved; LEI – Leisurely; BOL – Bold; MIS – Mischievous; COL – Colorful; IMA – Imaginative; DIL – Diligent; DUT – Dutiful

Table 6.10

Norming Sample Scale Means and Standard Deviations for Ethnic Groups Age 40 and Over

| Ethnicity | | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|
| *N* | | *55* | *4,337* | *2,877* | *1,260* | *75* | *23,895* | *2,121* | *27* | *34,647* |
| EXC | M | 3.31 | 3.09 | 2.71 | 3.01 | 2.67 | 2.73 | 2.76 | 3.70 | 2.79 |
| | SD | 2.45 | 1.86 | 1.88 | 2.32 | 2.61 | 2.19 | 2.46 | 2.80 | 2.16 |
| SKE | M | 3.98 | 4.35 | 3.91 | 4.60 | 3.85 | 3.48 | 3.94 | 5.48 | 3.70 |
| | SD | 2.61 | 2.19 | 2.14 | 2.42 | 2.33 | 2.08 | 2.28 | 2.08 | 2.16 |
| CAU | M | 2.85 | 2.38 | 2.39 | 3.35 | 3.43 | 2.91 | 3.07 | 4.89 | 2.83 |
| | SD | 2.41 | 1.93 | 2.01 | 2.38 | 2.57 | 2.38 | 2.48 | 2.10 | 2.32 |
| RES | M | 3.93 | 4.29 | 3.84 | 3.96 | 3.95 | 3.84 | 4.14 | 5.37 | 3.92 |
| | SD | 1.83 | 1.96 | 1.91 | 2.22 | 2.08 | 1.99 | 2.18 | 2.39 | 2.01 |
| LEI | M | 4.16 | 4.71 | 4.19 | 4.78 | 4.45 | 4.20 | 4.39 | 6.78 | 4.30 |
| | SD | 1.70 | 1.76 | 1.76 | 2.10 | 2.09 | 1.91 | 2.18 | 2.55 | 1.92 |
| BOL | M | 6.36 | 7.82 | 7.49 | 7.95 | 7.24 | 6.82 | 7.30 | 7.85 | 7.07 |
| | SD | 3.25 | 2.53 | 2.66 | 2.85 | 2.63 | 2.64 | 2.61 | 3.07 | 2.66 |
| MIS | M | 4.76 | 4.80 | 4.89 | 5.57 | 5.92 | 5.13 | 5.86 | 5.89 | 5.13 |
| | SD | 2.75 | 2.35 | 2.30 | 2.52 | 2.30 | 2.44 | 2.49 | 2.06 | 2.44 |
| COL | M | 6.55 | 6.68 | 6.56 | 6.74 | 7.64 | 6.95 | 7.49 | 6.63 | 6.91 |
| | SD | 3.01 | 2.44 | 2.56 | 2.94 | 2.84 | 2.83 | 2.83 | 2.50 | 2.77 |
| IMA | M | 5.35 | 4.82 | 4.79 | 5.69 | 5.67 | 4.80 | 5.48 | 6.41 | 4.88 |
| | SD | 2.61 | 2.39 | 2.29 | 2.51 | 2.48 | 2.37 | 2.45 | 2.66 | 2.39 |
| DIL | M | 9.78 | 10.37 | 10.18 | 10.00 | 9.00 | 9.54 | 9.09 | 9.30 | 9.69 |
| | SD | 1.77 | 1.76 | 1.79 | 2.13 | 2.12 | 2.14 | 2.28 | 1.90 | 2.11 |
| DUT | M | 7.75 | 8.55 | 8.45 | 8.12 | 7.88 | 7.94 | 7.51 | 7.48 | 8.04 |
| | SD | 1.79 | 1.91 | 2.00 | 2.20 | 2.09 | 2.03 | 2.13 | 2.03 | 2.04 |

*Note*. 0 – Two or More Race; 1 – Black or African-American; 2 – Hispanic or Latino; 3 – Asian; 4 – American Indian or Alaska Native; 5 – White; 6 – Not Indicated; 7 – Native Hawaiian or Other Pacific Islander; EXC – Excitable; SKE – Skeptical; CAU – Cautious; RES – Reserved; LEI – Leisurely; BOL – Bold; MIS – Mischievous; COL – Colorful; IMA – Imaginative; DIL – Diligent; DUT – Dutiful

Table 6.11

Norming Sample Scale Means and Standard Deviations for Ethnic Groups by Males

| Ethnicity | | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|
| *N* | | *82* | *5,149* | *6,124* | *1,878* | *1,782* | *23,127* | *16,235* | *37* | *54,414* |
| EXC | M | 3.22 | 2.90 | 2.66 | 2.89 | 2.39 | 2.70 | 2.70 | 4.57 | 2.71 |
| | SD | 2.56 | 1.85 | 1.84 | 2.39 | 2.27 | 2.28 | 2.44 | 3.52 | 2.25 |
| SKE | M | 4.27 | 4.72 | 4.39 | 4.75 | 6.11 | 3.78 | 4.33 | 6.03 | 4.21 |
| | SD | 2.71 | 2.24 | 2.25 | 2.50 | 2.70 | 2.24 | 2.38 | 2.29 | 2.36 |
| CAU | M | 2.72 | 2.08 | 2.13 | 3.05 | 2.04 | 2.67 | 2.87 | 5.46 | 2.60 |
| | SD | 2.09 | 1.78 | 1.88 | 2.32 | 2.08 | 2.28 | 2.38 | 3.17 | 2.24 |
| RES | M | 3.84 | 4.28 | 3.95 | 3.84 | 4.79 | 3.99 | 4.33 | 5.86 | 4.13 |
| | SD | 1.82 | 1.98 | 1.94 | 2.18 | 2.12 | 2.07 | 2.21 | 2.08 | 2.10 |
| LEI | M | 4.44 | 4.73 | 4.44 | 4.74 | 4.94 | 4.18 | 4.37 | 6.30 | 4.36 |
| | SD | 1.86 | 1.78 | 1.79 | 2.20 | 2.17 | 2.00 | 2.19 | 2.56 | 2.04 |
| BOL | M | 7.13 | 8.25 | 8.08 | 8.17 | 8.18 | 6.95 | 7.60 | 8.19 | 7.48 |
| | SD | 3.14 | 2.52 | 2.65 | 2.81 | 2.47 | 2.71 | 2.60 | 2.75 | 2.70 |
| MIS | M | 5.78 | 5.36 | 5.38 | 6.07 | 8.54 | 5.63 | 6.47 | 6.49 | 5.94 |
| | SD | 2.97 | 2.42 | 2.40 | 2.59 | 2.51 | 2.57 | 2.48 | 2.88 | 2.59 |
| COL | M | 7.01 | 7.12 | 7.05 | 7.32 | 8.25 | 7.22 | 7.70 | 7.51 | 7.37 |
| | SD | 3.08 | 2.50 | 2.62 | 3.03 | 2.55 | 2.93 | 2.88 | 2.71 | 2.85 |
| IMA | M | 6.00 | 5.22 | 5.22 | 5.86 | 6.97 | 4.86 | 5.59 | 7.05 | 5.26 |
| | SD | 2.60 | 2.43 | 2.39 | 2.48 | 2.52 | 2.39 | 2.41 | 2.91 | 2.45 |
| DIL | M | 9.90 | 10.48 | 10.33 | 9.94 | 9.92 | 9.51 | 9.06 | 9.62 | 9.59 |
| | SD | 2.03 | 1.70 | 1.72 | 2.18 | 2.08 | 2.16 | 2.29 | 2.18 | 2.17 |
| DUT | M | 8.01 | 8.72 | 8.74 | 8.09 | 7.75 | 7.78 | 7.37 | 7.84 | 7.87 |
| | SD | 1.90 | 1.90 | 1.95 | 2.20 | 2.13 | 2.00 | 2.09 | 2.06 | 2.08 |

*Note.* 0 – Two or More Races; 1 – Black or African-American; 2 – Hispanic or Latino; 3 – Asian; 4 – American Indian or Alaska Native; 5 – White; 6 – Not Indicated; 7 – Native Hawaiian or Other Pacific Islander; EXC – Excitable; SKE – Skeptical; CAU – Cautious; RES – Reserved; LEI – Leisurely; BOL – Bold; MIS – Mischievous; COL – Colorful; IMA – Imaginative; DIL – Diligent; DUT – Dutiful

Table 6.12

Norming Sample Scale Means and Standard Deviations for Ethnic Groups by Females

| Ethnicity | | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|
| *N* | | *39* | *7,543* | *7,775* | *1,944* | *1,234* | *24,146* | *10,002* | *40* | *52,723* |
| EXC | M | 3.77 | 2.85 | 3.07 | 3.34 | 2.43 | 2.82 | 2.70 | 5.38 | 2.85 |
| | SD | 3.36 | 1.88 | 2.15 | 2.44 | 2.34 | 2.22 | 2.47 | 3.15 | 2.23 |
| SKE | M | 5.03 | 4.63 | 5.15 | 5.39 | 5.83 | 3.88 | 4.21 | 6.03 | 4.34 |
| | SD | 2.75 | 2.11 | 2.39 | 2.46 | 2.66 | 2.21 | 2.32 | 2.40 | 2.33 |
| CAU | M | 3.59 | 2.21 | 2.88 | 3.47 | 2.10 | 2.99 | 3.27 | 5.43 | 2.91 |
| | SD | 2.93 | 1.92 | 2.25 | 2.50 | 2.10 | 2.47 | 2.61 | 2.30 | 2.42 |
| RES | M | 4.33 | 4.36 | 4.27 | 4.28 | 4.77 | 3.67 | 3.76 | 4.33 | 3.92 |
| | SD | 2.14 | 1.91 | 1.93 | 1.98 | 2.12 | 1.82 | 1.95 | 1.70 | 1.91 |
| LEI | M | 5.38 | 4.95 | 4.86 | 5.25 | 4.73 | 4.42 | 4.36 | 6.65 | 4.59 |
| | SD | 2.37 | 1.65 | 1.80 | 1.96 | 2.13 | 1.86 | 2.13 | 2.59 | 1.91 |
| BOL | M | 7.67 | 8.40 | 8.38 | 8.31 | 7.93 | 7.26 | 7.56 | 8.38 | 7.70 |
| | SD | 2.81 | 2.39 | 2.61 | 2.69 | 2.45 | 2.56 | 2.56 | 3.04 | 2.60 |
| MIS | M | 6.23 | 4.89 | 5.17 | 5.46 | 8.17 | 5.17 | 5.73 | 5.85 | 5.32 |
| | SD | 2.87 | 2.23 | 2.33 | 2.51 | 2.65 | 2.48 | 2.44 | 2.37 | 2.48 |
| COL | M | 7.85 | 7.14 | 6.86 | 6.89 | 7.95 | 7.11 | 7.63 | 6.85 | 7.19 |
| | SD | 2.75 | 2.27 | 2.44 | 2.64 | 2.58 | 2.62 | 2.79 | 2.49 | 2.60 |
| IMA | M | 6.95 | 5.21 | 5.49 | 6.25 | 6.63 | 5.19 | 5.53 | 6.90 | 5.38 |
| | SD | 3.06 | 2.37 | 2.45 | 2.51 | 2.45 | 2.44 | 2.46 | 2.73 | 2.46 |
| DIL | M | 9.92 | 10.50 | 10.45 | 10.56 | 9.84 | 9.93 | 9.33 | 10.28 | 10.00 |
| | SD | 1.98 | 1.60 | 1.66 | 1.86 | 2.16 | 1.98 | 2.26 | 1.87 | 1.99 |
| DUT | M | 8.03 | 8.88 | 8.97 | 9.01 | 7.84 | 8.49 | 7.70 | 8.38 | 8.47 |
| | SD | 2.29 | 1.81 | 1.92 | 2.13 | 2.19 | 2.06 | 2.14 | 2.03 | 2.07 |

*Note.* 0 – Two or More Races; 1 – Black or African-American; 2 – Hispanic or Latino; 3 – Asian; 4 – American Indian or Alaska Native; 5 – White; 6 – Not Indicated; 7 – Native Hawaiian or Other Pacific Islander; EXC – Excitable; SKE – Skeptical; CAU – Cautious; RES – Reserved; LEI – Leisurely; BOL – Bold; MIS – Mischievous; COL – Colorful; IMA – Imaginative; DIL – Diligent; DUT – Dutiful

Table 6.13

Norming Sample Scale Means and Standard Deviations for Ethnic Groups by Males Under 40

| Ethnicity | | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|
| *N* | | *36* | *2,391* | *3,474* | *881* | *29* | *8,639* | *970* | *23* | *16,443* |
| EXC | M | 3.42 | 2.69 | 2.54 | 2.82 | 3.14 | 2.70 | 2.72 | 5.39 | 2.68 |
| | SD | 2.72 | 1.84 | 1.77 | 2.50 | 2.64 | 2.35 | 2.67 | 3.88 | 2.21 |
| SKE | M | 4.94 | 5.01 | 4.56 | 4.99 | 4.59 | 4.09 | 4.47 | 6.52 | 4.40 |
| | SD | 2.74 | 2.22 | 2.17 | 2.54 | 2.61 | 2.30 | 2.40 | 2.39 | 2.31 |
| CAU | M | 2.69 | 1.91 | 1.98 | 2.85 | 3.17 | 2.53 | 2.72 | 6.04 | 2.36 |
| | SD | 1.89 | 1.71 | 1.82 | 2.28 | 3.19 | 2.25 | 2.32 | 3.57 | 2.13 |
| RES | M | 3.67 | 4.26 | 3.95 | 3.81 | 4.17 | 3.87 | 4.23 | 5.48 | 3.96 |
| | SD | 1.72 | 1.96 | 1.91 | 2.05 | 2.47 | 1.99 | 2.21 | 1.93 | 1.99 |
| LEI | M | 4.94 | 4.84 | 4.52 | 4.80 | 4.79 | 4.26 | 4.37 | 6.35 | 4.44 |
| | SD | 1.98 | 1.81 | 1.75 | 2.20 | 2.44 | 2.04 | 2.31 | 2.55 | 1.99 |
| BOL | M | 8.31 | 8.67 | 8.35 | 8.35 | 7.45 | 7.25 | 7.62 | 8.87 | 7.77 |
| | SD | 2.65 | 2.40 | 2.57 | 2.73 | 2.68 | 2.70 | 2.71 | 2.63 | 2.70 |
| MIS | M | 7.22 | 5.74 | 5.57 | 6.41 | 6.76 | 5.90 | 6.48 | 6.78 | 5.87 |
| | SD | 2.82 | 2.36 | 2.40 | 2.60 | 2.87 | 2.61 | 2.55 | 3.33 | 2.54 |
| COL | M | 8.11 | 7.56 | 7.34 | 7.73 | 8.00 | 7.53 | 7.64 | 8.17 | 7.51 |
| | SD | 3.01 | 2.38 | 2.56 | 2.99 | 3.24 | 2.87 | 2.97 | 2.82 | 2.75 |
| IMA | M | 7.14 | 5.61 | 5.46 | 6.10 | 5.66 | 5.03 | 5.55 | 7.83 | 5.30 |
| | SD | 2.52 | 2.43 | 2.39 | 2.47 | 2.77 | 2.40 | 2.57 | 3.01 | 2.44 |
| DIL | M | 9.89 | 10.56 | 10.39 | 10.02 | 8.97 | 9.66 | 9.20 | 10.17 | 9.94 |
| | SD | 2.46 | 1.63 | 1.65 | 2.20 | 2.44 | 2.10 | 2.27 | 2.04 | 2.02 |
| DUT | M | 8.19 | 8.89 | 8.86 | 8.24 | 7.55 | 7.94 | 7.69 | 8.09 | 8.28 |
| | SD | 2.15 | 1.86 | 1.90 | 2.19 | 1.57 | 2.02 | 2.13 | 2.04 | 2.04 |

*Note.* 0 – Two or More Races; 1 – Black or African-American; 2 – Hispanic or Latino; 3 – Asian; 4 – American Indian or Alaska Native; 5 – White; 6 – Not Indicated; 7 – Native Hawaiian or Other Pacific Islander; EXC – Excitable; SKE – Skeptical; CAU – Cautious; RES – Reserved; LEI – Leisurely; BOL – Bold; MIS – Mischievous; COL – Colorful; IMA – Imaginative; DIL – Diligent; DUT – Dutiful

Table 6.14

Norming Sample Scale Means and Standard Deviations for Ethnic Groups by Females Under 40

| Ethnicity | | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|
| *N* | | *25* | *5,755* | *2,570* | *1,140* | *25* | *9,071* | *787* | *25* | *19,398* |
| EXC | M | 4.08 | 2.80 | 2.54 | 3.07 | 2.80 | 2.72 | 2.90 | 5.92 | 2.75 |
| | SD | 3.75 | 1.86 | 1.83 | 2.27 | 2.84 | 2.21 | 2.81 | 3.13 | 2.11 |
| SKE | M | 5.44 | 4.76 | 4.69 | 5.17 | 4.60 | 3.97 | 4.42 | 6.04 | 4.40 |
| | SD | 2.80 | 2.08 | 2.13 | 2.22 | 2.12 | 2.10 | 2.26 | 2.52 | 2.16 |
| CAU | M | 4.04 | 2.08 | 2.33 | 3.13 | 3.64 | 2.85 | 3.31 | 5.52 | 2.59 |
| | SD | 2.99 | 1.85 | 2.02 | 2.39 | 2.87 | 2.43 | 2.65 | 2.54 | 2.27 |
| RES | M | 4.92 | 4.39 | 3.93 | 4.16 | 3.92 | 3.55 | 3.73 | 4.16 | 3.89 |
| | SD | 2.27 | 1.91 | 1.77 | 1.89 | 1.55 | 1.70 | 1.96 | 1.31 | 1.83 |
| LEI | M | 5.72 | 4.99 | 4.64 | 5.06 | 4.36 | 4.39 | 4.43 | 6.40 | 4.65 |
| | SD | 2.69 | 1.60 | 1.65 | 1.79 | 2.22 | 1.80 | 2.09 | 2.72 | 1.77 |
| BOL | M | 8.16 | 8.59 | 8.28 | 8.25 | 8.08 | 7.46 | 7.73 | 8.00 | 7.96 |
| | SD | 2.46 | 2.34 | 2.51 | 2.61 | 2.48 | 2.52 | 2.40 | 2.93 | 2.52 |
| MIS | M | 6.44 | 4.99 | 5.02 | 5.43 | 6.00 | 5.16 | 5.59 | 5.76 | 5.13 |
| | SD | 2.72 | 2.21 | 2.30 | 2.51 | 2.33 | 2.32 | 2.41 | 2.49 | 2.31 |
| COL | M | 7.72 | 7.28 | 7.12 | 7.01 | 7.60 | 7.35 | 7.60 | 6.72 | 7.29 |
| | SD | 2.79 | 2.23 | 2.37 | 2.59 | 3.08 | 2.56 | 2.78 | 2.35 | 2.46 |
| IMA | M | 7.20 | 5.34 | 5.41 | 6.21 | 5.68 | 5.19 | 5.43 | 6.96 | 5.34 |
| | SD | 2.92 | 2.34 | 2.41 | 2.45 | 2.85 | 2.40 | 2.53 | 2.72 | 2.41 |
| DIL | M | 10.20 | 10.57 | 10.38 | 10.51 | 10.00 | 10.06 | 9.65 | 10.32 | 10.27 |
| | SD | 1.98 | 1.53 | 1.62 | 1.82 | 1.76 | 1.90 | 2.19 | 2.10 | 1.79 |
| DUT | M | 8.24 | 9.02 | 8.90 | 9.03 | 7.88 | 8.70 | 8.02 | 8.96 | 8.81 |
| | SD | 2.45 | 1.75 | 1.85 | 2.04 | 1.92 | 1.99 | 2.11 | 1.86 | 1.93 |

*Note.* 0 – Two or More Races; 1 – Black or African-American; 2 – Hispanic or Latino; 3 – Asian; 4 – American Indian or Alaska Native; 5 – White; 6 – Not Indicated; 7 – Native Hawaiian or Other Pacific Islander; EXC – Excitable; SKE – Skeptical; CAU – Cautious; RES – Reserved; LEI – Leisurely; BOL – Bold; MIS – Mischievous; COL – Colorful; IMA – Imaginative; DIL – Diligent; DUT – Dutiful

Table 6.15

Norming Sample Scale Means and Standard Deviations for Ethnic Groups by Males 40 & Over

| Ethnicity | | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|
| *N* | | *45* | *2,669* | *2,164* | *916* | *44* | *13,705* | *1,349* | *14* | *20,906* |
| EXC | M | 3.13 | 3.10 | 2.71 | 2.99 | 2.07 | 2.71 | 2.86 | 3.21 | 2.78 |
| | SD | 2.44 | 1.82 | 1.84 | 2.27 | 1.82 | 2.23 | 2.51 | 2.36 | 2.17 |
| SKE | M | 3.82 | 4.45 | 3.89 | 4.55 | 3.73 | 3.55 | 4.07 | 5.21 | 3.78 |
| | SD | 2.57 | 2.21 | 2.14 | 2.44 | 2.36 | 2.17 | 2.30 | 1.93 | 2.22 |
| CAU | M | 2.78 | 2.21 | 2.25 | 3.24 | 3.16 | 2.76 | 2.97 | 4.50 | 2.67 |
| | SD | 2.27 | 1.82 | 1.89 | 2.32 | 2.44 | 2.29 | 2.40 | 2.14 | 2.22 |
| RES | M | 4.02 | 4.29 | 3.86 | 3.90 | 4.07 | 4.06 | 4.32 | 6.50 | 4.08 |
| | SD | 1.89 | 1.99 | 1.94 | 2.27 | 1.92 | 2.10 | 2.25 | 2.24 | 2.09 |
| LEI | M | 4.04 | 4.64 | 4.18 | 4.73 | 4.02 | 4.12 | 4.45 | 6.21 | 4.24 |
| | SD | 1.69 | 1.74 | 1.76 | 2.16 | 1.90 | 1.98 | 2.18 | 2.67 | 1.96 |
| BOL | M | 6.33 | 7.87 | 7.47 | 7.99 | 7.55 | 6.72 | 7.40 | 7.07 | 7.05 |
| | SD | 3.16 | 2.58 | 2.65 | 2.90 | 2.57 | 2.71 | 2.63 | 2.64 | 2.73 |
| MIS | M | 4.64 | 4.98 | 4.97 | 5.73 | 6.16 | 5.41 | 6.18 | 6.00 | 5.37 |
| | SD | 2.63 | 2.40 | 2.32 | 2.54 | 2.44 | 2.52 | 2.45 | 1.96 | 2.50 |
| COL | M | 6.20 | 6.72 | 6.56 | 6.89 | 7.86 | 7.00 | 7.66 | 6.43 | 6.95 |
| | SD | 2.89 | 2.53 | 2.61 | 3.03 | 2.76 | 2.96 | 2.83 | 2.21 | 2.88 |
| IMA | M | 5.11 | 4.85 | 4.75 | 5.60 | 5.52 | 4.72 | 5.56 | 5.79 | 4.84 |
| | SD | 2.34 | 2.37 | 2.29 | 2.47 | 2.39 | 2.37 | 2.43 | 2.33 | 2.39 |
| DIL | M | 9.93 | 10.42 | 10.18 | 9.86 | 8.84 | 9.42 | 9.01 | 8.71 | 9.62 |
| | SD | 1.66 | 1.74 | 1.80 | 2.16 | 2.08 | 2.20 | 2.24 | 2.16 | 2.15 |
| DUT | M | 7.87 | 8.59 | 8.44 | 8.02 | 7.61 | 7.70 | 7.42 | 7.43 | 7.89 |
| | SD | 1.70 | 1.91 | 2.00 | 2.21 | 2.05 | 1.97 | 2.04 | 2.10 | 2.01 |

*Note.* 0 – Two or More Races; 1 – Black or African-American; 2 – Hispanic or Latino; 3 – Asian; 4 – American Indian or Alaska Native; 5 – White; 6 – Not Indicated; 7 – Native Hawaiian or Other Pacific Islander; EXC – Excitable; SKE – Skeptical; CAU – Cautious; RES – Reserved; LEI – Leisurely; BOL – Bold; MIS – Mischievous; COL – Colorful; IMA – Imaginative; DIL – Diligent; DUT – Dutiful

Table 6.16

Norming Sample Scale Means and Standard Deviations for Ethnic Groups Females 40 & Over

| Ethnicity | | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|
| *N* | | *10* | *1,667* | *713* | *343* | *31* | *10,188* | *769* | *13* | *13,734* |
| EXC | M | 4.10 | 3.06 | 2.73 | 3.08 | 3.52 | 2.76 | 2.59 | 4.23 | 2.80 |
| | SD | 2.47 | 1.92 | 2.00 | 2.44 | 3.29 | 2.13 | 2.36 | 3.22 | 2.13 |
| SKE | M | 4.70 | 4.18 | 3.94 | 4.73 | 4.03 | 3.38 | 3.70 | 5.77 | 3.57 |
| | SD | 2.79 | 2.14 | 2.14 | 2.35 | 2.33 | 1.96 | 2.20 | 2.28 | 2.05 |
| CAU | M | 3.20 | 2.66 | 2.81 | 3.64 | 3.81 | 3.13 | 3.26 | 5.31 | 3.08 |
| | SD | 3.08 | 2.06 | 2.30 | 2.51 | 2.74 | 2.49 | 2.62 | 2.06 | 2.45 |
| RES | M | 3.50 | 4.29 | 3.78 | 4.15 | 3.77 | 3.56 | 3.82 | 4.15 | 3.69 |
| | SD | 1.58 | 1.90 | 1.81 | 2.08 | 2.31 | 1.79 | 2.02 | 1.95 | 1.84 |
| LEI | M | 4.70 | 4.84 | 4.23 | 4.89 | 5.06 | 4.31 | 4.28 | 7.38 | 4.39 |
| | SD | 1.70 | 1.78 | 1.75 | 1.94 | 2.22 | 1.82 | 2.20 | 2.36 | 1.85 |
| BOL | M | 6.50 | 7.75 | 7.55 | 7.85 | 6.81 | 6.95 | 7.13 | 8.69 | 7.12 |
| | SD | 3.81 | 2.46 | 2.67 | 2.71 | 2.69 | 2.53 | 2.57 | 3.38 | 2.56 |
| MIS | M | 5.30 | 4.50 | 4.67 | 5.13 | 5.58 | 4.76 | 5.31 | 5.77 | 4.77 |
| | SD | 3.33 | 2.25 | 2.20 | 2.41 | 2.08 | 2.28 | 2.46 | 2.24 | 2.29 |
| COL | M | 8.10 | 6.61 | 6.57 | 6.33 | 7.32 | 6.88 | 7.19 | 6.85 | 6.83 |
| | SD | 3.18 | 2.30 | 2.40 | 2.62 | 2.96 | 2.65 | 2.81 | 2.85 | 2.61 |
| IMA | M | 6.40 | 4.77 | 4.92 | 5.91 | 5.87 | 4.90 | 5.35 | 7.08 | 4.94 |
| | SD | 3.57 | 2.43 | 2.30 | 2.61 | 2.64 | 2.36 | 2.48 | 2.93 | 2.39 |
| DIL | M | 9.10 | 10.30 | 10.18 | 10.37 | 9.23 | 9.71 | 9.25 | 9.92 | 9.80 |
| | SD | 2.18 | 1.78 | 1.76 | 2.02 | 2.20 | 2.05 | 2.34 | 1.38 | 2.04 |
| DUT | M | 7.20 | 8.49 | 8.47 | 8.39 | 8.26 | 8.27 | 7.68 | 7.54 | 8.28 |
| | SD | 2.15 | 1.90 | 2.02 | 2.17 | 2.13 | 2.07 | 2.27 | 2.03 | 2.07 |

*Note.* 0 – Two or More Races; 1 – Black or African-American; 2 – Hispanic or Latino; 3 – Asian; 4 – American Indian or Alaska Native; 5 – White; 6 – Not Indicated; 7 – Native Hawaiian or Other Pacific Islander; EXC – Excitable; SKE – Skeptical; CAU – Cautious; RES – Reserved; LEI – Leisurely; BOL – Bold; MIS – Mischievous; COL – Colorful; IMA – Imaginative; DIL – Diligent; DUT – Dutiful

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# APPENDIX A: CORRELATIONS BETWEEN THE HDS SCALES AND THE HPI SCALES AND HOMOGENOUS ITEM COMPOSITES

| Scales | EXC | SKE | CAU | RES | LEI | BOL | MIS | COL | IMA | DIL | DUT |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Adjustment** | -.71 | -.53 | -.45 | -.26 | -.35 | -.15 | -.15 | -.13 | -.28 | -.12 | -.12 |
| Empathy | -.53 | -.38 | -.31 | -.22 | -.19 | -.07 | -.04 | -.03 | -.12 | -.17 | .02 |
| Not Anxious | -.42 | -.24 | -.36 | -.10 | -.18 | .02 | .08 | .07 | -.04 | -.16 | -.13 |
| No Guilt | -.57 | -.30 | -.40 | -.17 | -.33 | -.03 | -.08 | -.09 | -.22 | -.08 | -.24 |
| Calmness | -.46 | -.25 | -.30 | -.07 | -.14 | -.06 | -.08 | -.13 | -.18 | .04 | -.11 |
| Even Tempered | -.53 | -.46 | -.31 | -.22 | -.30 | -.24 | -.20 | -.18 | -.23 | -.09 | -.05 |
| No Complaints | -.38 | -.36 | -.18 | -.11 | -.18 | -.20 | -.16 | -.18 | -.21 | .01 | -.02 |
| Trusting | -.35 | -.60 | -.22 | -.29 | -.33 | -.24 | -.25 | -.07 | -.24 | -.18 | -.10 |
| Good Attachment | -.28 | -.14 | -.15 | -.12 | -.12 | .02 | -.07 | -.06 | -.18 | .02 | -.02 |
| **Ambition** | -.46 | -.23 | -.68 | -.38 | -.31 | .14 | .11 | .28 | .01 | .00 | -.28 |
| Competitive | -.16 | -.04 | -.33 | -.17 | -.10 | .13 | .06 | .16 | .04 | .21 | -.12 |
| Self Confidence | -.23 | -.03 | -.49 | -.18 | -.06 | .24 | .15 | .24 | .04 | .09 | -.18 |
| Accomplishment | -.39 | -.29 | -.40 | -.18 | -.32 | -.11 | -.04 | -.06 | -.11 | -.11 | -.25 |
| Leadership | -.16 | .06 | -.33 | -.17 | -.05 | .32 | .25 | .35 | .18 | .08 | -.18 |
| Identity | -.42 | -.30 | -.35 | -.15 | -.29 | -.14 | -.13 | -.10 | -.20 | -.01 | -.16 |
| No Social Anxiety | -.30 | -.16 | -.57 | -.45 | -.21 | .14 | .13 | .39 | .08 | -.07 | -.14 |
| **Sociability** | -.00 | .16 | -.25 | -.29 | .12 | .32 | .47 | .61 | .42 | .01 | .04 |
| Likes Parties | -.05 | .03 | -.16 | -.31 | .03 | .14 | .24 | .38 | .20 | .02 | .05 |
| Likes Crowds | -.13 | -.02 | -.22 | -.24 | .00 | .11 | .24 | .26 | .12 | .01 | .02 |
| Experience Seeking | -.12 | .10 | -.26 | -.13 | .03 | .23 | .39 | .29 | .37 | .01 | -.10 |
| Exhibitionistic | .21 | .26 | -.00 | -.09 | .19 | .29 | .32 | .51 | .32 | -.04 | .09 |
| Entertaining | .06 | .13 | -.16 | -.18 | .11 | .24 | .28 | .48 | .32 | .04 | .06 |
| **Interpersonal Sensitivity** | -.43 | -.33 | -.32 | -.50 | -.17 | .04 | .03 | .18 | -.02 | .03 | .14 |
| Easy to Live With | -.35 | -.24 | -.23 | -.31 | -.05 | .09 | .04 | .13 | -.03 | .04 | .15 |
| Sensitive | -.13 | -.05 | -.02 | -.17 | .01 | .13 | .07 | .11 | .10 | .09 | .11 |
| Caring | -.23 | -.15 | -.16 | -.30 | -.08 | .09 | .08 | .17 | .07 | .07 | .16 |
| Likes People | -.25 | -.12 | -.39 | -.54 | -.12 | .15 | .15 | .34 | .09 | .01 | .06 |
| No Hostility | -.40 | -.50 | -.15 | -.18 | -.26 | -.30 | -.27 | -.21 | -.29 | -.09 | .04 |
| **Prudence** | -.36 | -.36 | -.13 | -.22 | -.20 | -.10 | -.39 | -.24 | -.38 | .31 | .14 |
| Moralistic | -.26 | -.10 | -.23 | -.10 | -.08 | .18 | .09 | .05 | -.01 | .13 | -.05 |
| Mastery | -.05 | .04 | -.05 | -.05 | .07 | .16 | -.05 | .00 | -.03 | .52 | .12 |
| Virtuous | -.35 | -.18 | -.19 | -.10 | -.07 | .03 | .03 | -.05 | -.05 | .11 | .08 |
| Not Autonomous | -.04 | -.16 | .08 | -.29 | -.07 | -.07 | -.17 | -.06 | -.18 | -.01 | .16 |
| Not Spontaneous | -.06 | -.13 | -.01 | -.06 | -.13 | -.11 | -.31 | -.20 | -.26 | .20 | .08 |
| Impulse Control | -.18 | -.21 | .04 | -.04 | -.15 | -.19 | -.55 | -.34 | -.40 | .20 | .09 |
| Avoids Trouble | -.31 | -.48 | -.07 | -.19 | -.25 | -.32 | -.36 | -.20 | -.40 | .00 | .07 |
| **Inquisitive** | -.11 | .09 | -.20 | -.13 | .01 | .23 | .35 | .26 | .33 | .09 | -.03 |
| Science Ability | -.13 | .03 | -.11 | -.01 | -.05 | .15 | .16 | .06 | .16 | .09 | .01 |
| Curiosity | -.09 | .09 | -.18 | -.08 | -.01 | .17 | .23 | .10 | .19 | .14 | -.03 |
| Thrill Seeking | -.00 | .14 | -.09 | -.07 | .08 | .17 | .37 | .18 | .24 | .08 | -.02 |
| Intellectual Games | -.12 | .02 | -.08 | -.05 | .06 | .08 | .07 | .04 | .11 | .13 | -.02 |
| Generates Ideas | -.07 | .04 | -.23 | -.17 | -.01 | .22 | .26 | .38 | .30 | -.05 | -.03 |
| Culture | -.04 | .00 | -.05 | -.09 | -.05 | .03 | .08 | .13 | .17 | -.03 | -.01 |
| **Learning Approach** | -.12 | -.00 | -.14 | -.06 | -.01 | .15 | .08 | .14 | .05 | -.02 | -.09 |
| Education | -.05 | -.01 | -.10 | -.06 | -.00 | .14 | .08 | .13 | .08 | .01 | -.02 |
| Math Ability | -.09 | .06 | -.08 | -.01 | -.04 | .10 | .10 | .06 | -.00 | -.00 | -.06 |
| Good Memory | -.09 | .03 | -.18 | -.09 | -.01 | .16 | .06 | .13 | .04 | .05 | -.09 |
| Reading | -.08 | -.06 | -.04 | -.02 | .01 | .03 | .00 | .06 | .03 | -.08 | -.06 |
| **Occupational Scales** | | | | | | | | | | | |
| Service Orientation | -.51 | -.32 | -.28 | -.22 | -.14 | .01 | .01 | -.01 | -.06 | -.02 | .08 |
| Stress Tolerance | -.66 | -.42 | -.49 | -.19 | -.35 | -.11 | -.08 | -.11 | -.22 | -.10 | -.23 |
| Reliability | -.42 | -.46 | -.11 | -.18 | -.28 | -.28 | -.48 | -.31 | -.48 | .08 | .07 |
| Clerical | -.57 | -.46 | -.43 | -.30 | -.29 | -.05 | -.06 | .06 | -.18 | -.02 | -.07 |
| Sales | -.13 | .07 | -.43 | -.39 | .02 | .35 | .51 | .62 | .42 | -.03 | -.03 |
| Manager | -.52 | -.39 | -.47 | -.28 | -.31 | -.04 | -.11 | -.00 | -.19 | .15 | -.15 |
| **Miscellaneous HICs** | | | | | | | | | | | |
| Self Focus | .31 | .23 | .16 | .10 | .22 | .18 | .12 | .16 | .25 | .05 | .13 |
| Impression Management | -.37 | -.36 | -.29 | -.10 | -.36 | -.20 | -.27 | -.26 | -.26 | -.06 | -.20 |
| Appearance | .18 | .21 | -.04 | .04 | .15 | .19 | .55 | .34 | .40 | -.20 | -.08 |

*Note.* N = 754; EXC – Excitable; SKE – Skeptical; CAU – Cautious; RES – Reserved; LEI – Leisurely; BOL – Bold; MIS – Mischievous; COL – Colorful; IMA – Imaginative; DIL – Diligent; DUT – Dutiful; Correlations ≥ .07 are significant at .05; Correlations ≥ .10 are significant at .01 (two-tailed)

## APPENDIX B: REFERENCES FOR STUDIES INCLUDED IN HDS META-ANALYSIS

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# APPENDIX C: COMPLETE META-ANALYSIS RESULTS FOR THE HDS SCALES ALIGNED WITH COMPETENCY DOMAINS AND CRITERIA

| **Intrapersonal Domain** | K | N | Avg N | r obs | $SD_r$ | $\rho_v$ | ρ | $SD_\rho$ | %VE | 90% CV |
|---|---|---|---|---|---|---|---|---|---|---|
| Excitable | | | | | | | | | | |
| Achievement Orientation | 16 | 1194 | 75 | 0.01 | 0.11 | 0.01 | 0.01 | 0.18 | 100 | 0.01 |
| Active Listening | 3 | 349 | 116 | -0.20* | 0.14 | -0.21* | -0.27* | 0.21 | 58 | -0.48 |
| Building Relationships | 7 | 656 | 94 | -0.10 | 0.16 | -0.11 | -0.14 | 0.21 | 72 | -0.32 |
| Building Teams | 5 | 261 | 52 | 0.07 | 0.11 | 0.08 | 0.10 | 0.17 | 100 | 0.10 |
| Business Acumen | 7 | 668 | 95 | 0.02 | 0.16 | 0.03 | 0.04 | 0.27 | 45 | -0.29 |
| Caring | 2 | 249 | 125 | -0.21* | 0.06 | -0.21* | -0.27* | 0.07 | 100 | -0.27 |
| Citizenship | 6 | 218 | 36 | -0.17* | 0.14 | -0.20* | -0.25* | 0.21 | 100 | -0.26 |
| Decision Making | 15 | 1483 | 99 | -0.04 | 0.10 | -0.05 | -0.07 | 0.16 | 100 | -0.07 |
| Delegation | 2 | 398 | 199 | -0.11* | 0.05 | -0.15* | -0.19* | 0.09 | 100 | -0.19 |
| Dependability | 8 | 787 | 98 | -0.07 | 0.12 | -0.10 | -0.13 | 0.21 | 75 | -0.30 |
| Detail Orientation | 4 | 368 | 92 | -0.11 | 0.12 | -0.14 | -0.18 | 0.20 | 83 | -0.31 |
| Employee Development | 8 | 1000 | 125 | -0.06 | 0.13 | -0.07 | -0.09 | 0.19 | 69 | -0.26 |
| Financial Acumen | 3 | 196 | 65 | -0.05 | 0.14 | -0.06 | -0.08 | 0.22 | 100 | -0.08 |
| Flexibility | 8 | 754 | 94 | -0.11* | 0.15 | -0.15* | -0.19* | 0.25 | 49 | -0.49 |
| Goal Setting | 2 | 225 | 113 | 0.01 | 0.02 | 0.02 | 0.02 | 0.05 | 100 | 0.02 |
| Industry Knowledge | 4 | 913 | 228 | -0.06 | 0.07 | -0.07 | -0.09 | 0.13 | 77 | -0.19 |
| Influence | 7 | 551 | 79 | -0.08 | 0.13 | -0.08 | -0.10 | 0.18 | 100 | -0.10 |
| Information Analysis | 3 | 344 | 115 | -0.02 | 0.14 | -0.02 | -0.02 | 0.21 | 62 | -0.24 |
| Initiative | 6 | 1469 | 245 | -0.02 | 0.12 | -0.03 | -0.03 | 0.21 | 30 | -0.32 |
| Innovation | 8 | 1514 | 189 | -0.09* | 0.09 | -0.10* | -0.13* | 0.13 | 100 | -0.13 |
| Interpersonal Skills | 4 | 233 | 58 | -0.14* | 0.12 | -0.17* | -0.22* | 0.20 | 100 | -0.22 |
| Intrapersonal Skills | 2 | 839 | 420 | -0.05* | 0.04 | -0.06* | -0.07* | 0.05 | 100 | -0.07 |
| Leadership | 19 | 2437 | 128 | -0.05* | 0.09 | -0.07* | -0.09* | 0.16 | 98 | -0.13 |
| Managing Change | 4 | 355 | 89 | -0.09 | 0.13 | -0.12 | -0.15 | 0.20 | 87 | -0.27 |
| Managing Performance | 6 | 209 | 35 | -0.03 | 0.07 | -0.05 | -0.07 | 0.10 | 100 | -0.07 |
| Motivating Others | 5 | 473 | 95 | -0.05 | 0.10 | -0.07 | -0.09 | 0.16 | 100 | -0.09 |
| Negotiation | 5 | 581 | 116 | -0.12 | 0.16 | -0.13 | -0.16 | 0.22 | 56 | -0.40 |
| Oral Communication | 11 | 1248 | 113 | -0.08* | 0.10 | -0.09* | -0.12* | 0.16 | 100 | -0.12 |
| Organizational Commitment | 2 | 42 | 21 | 0.28 | 0.27 | 0.47 | 0.59 | 0.55 | 42 | -0.10 |
| Planning/Organizing | 7 | 782 | 112 | -0.09* | 0.07 | -0.10* | -0.12* | 0.09 | 100 | -0.12 |
| Problem Solving | 5 | 465 | 93 | -0.05 | 0.14 | -0.05 | -0.06 | 0.19 | 95 | -0.13 |
| Professionalism | 4 | 1283 | 321 | -0.11* | 0.06 | -0.14* | -0.18* | 0.10 | 100 | -0.17 |
| Quality Orientation | 7 | 456 | 65 | -0.08 | 0.13 | -0.10 | -0.13 | 0.21 | 100 | -0.13 |
| Resource Management | 3 | 378 | 126 | 0.05 | 0.10 | 0.07 | 0.09 | 0.16 | 91 | 0.01 |
| Risk Management | 4 | 128 | 32 | 0.00 | 0.08 | -0.01 | -0.01 | 0.13 | 100 | -0.01 |
| Safety | 5 | 344 | 69 | 0.00 | 0.15 | 0.01 | 0.01 | 0.26 | 65 | -0.24 |
| Sales Ability | 3 | 178 | 59 | 0.18* | 0.07 | 0.25* | 0.31* | 0.19 | 100 | 0.31 |
| Self Development | 8 | 760 | 95 | -0.09 | 0.13 | -0.10 | -0.13 | 0.19 | 87 | -0.24 |
| Service Orientation | 12 | 1510 | 126 | -0.02 | 0.11 | -0.02 | -0.03 | 0.18 | 70 | -0.19 |
| Strategic Planning | 10 | 1161 | 116 | -0.01 | 0.07 | -0.01 | -0.02 | 0.11 | 100 | -0.02 |
| Stress Tolerance | 10 | 1095 | 110 | -0.15* | 0.17 | -0.18* | -0.23* | 0.25 | 43 | -0.55 |
| Talent Management | 4 | 287 | 72 | 0.04* | 0.02 | 0.05* | 0.06* | 0.02 | 100 | 0.06 |
| Teamwork | 9 | 1938 | 215 | -0.03 | 0.08 | -0.04 | -0.05 | 0.13 | 85 | -0.13 |
| Trustworthiness | 17 | 1414 | 83 | -0.03 | 0.12 | -0.04 | -0.05 | 0.20 | 92 | -0.14 |
| Valuing Diversity | 7 | 491 | 70 | -0.06 | 0.12 | -0.08 | -0.10 | 0.18 | 100 | -0.10 |
| Work Attitude | 10 | 857 | 86 | -0.12* | 0.09 | -0.16* | -0.20* | 0.16 | 100 | -0.20 |
| Work Ethic | 2 | 350 | 175 | -0.07 | 0.17 | -0.08 | -0.10 | 0.21 | 39 | -0.37 |
| Work Skills | 6 | 529 | 88 | -0.03 | 0.11 | -0.04 | -0.05 | 0.18 | 100 | -0.05 |
| Diligent | | | | | | | | | | |
| Achievement Orientation | 16 | 1194 | 75 | 0.03 | 0.14 | 0.04 | 0.05 | 0.24 | 73 | -0.14 |
| Active Listening | 3 | 349 | 116 | 0.00 | 0.04 | 0.00 | 0.00 | 0.08 | 100 | 0.00 |
| Building Relationships | 7 | 656 | 94 | -0.03 | 0.15 | -0.04 | -0.05 | 0.25 | 59 | -0.31 |
| Building Teams | 5 | 261 | 52 | -0.08 | 0.11 | -0.09 | -0.13 | 0.19 | 100 | -0.13 |
| Business Acumen | 7 | 668 | 95 | 0.04 | 0.08 | 0.05 | 0.07 | 0.14 | 100 | 0.07 |
| Caring | 2 | 249 | 125 | -0.01 | 0.04 | -0.01 | -0.02 | 0.09 | 100 | -0.02 |
| Citizenship | 6 | 218 | 36 | 0.01 | 0.19 | 0.02 | 0.02 | 0.34 | 81 | -0.22 |
| Decision Making | 15 | 1484 | 99 | -0.02 | 0.11 | -0.02 | -0.03 | 0.20 | 89 | -0.13 |
| Delegation | 2 | 398 | 199 | 0.00 | 0.08 | 0.00 | -0.01 | 0.17 | 61 | -0.18 |
| Dependability | 8 | 788 | 99 | 0.01 | 0.14 | 0.02 | 0.03 | 0.27 | 49 | -0.29 |
| Detail Orientation | 4 | 369 | 92 | 0.12* | 0.09 | 0.15* | 0.21* | 0.16 | 100 | 0.21 |

## Appendix C: Complete Meta-Analysis Results for HDS Scales Aligned with Competency Domains and Criteria (Continued)

| **Intrapersonal Domain** | K | N | Avg N | r obs | $SD_r$ | $\rho_v$ | ρ | $SD_\rho$ | %VE | 90% CV |
|---|---|---|---|---|---|---|---|---|---|---|
| Diligent (Continued) | | | | | | | | | | |
| Employee Development | 8 | 1000 | 125 | -0.03 | 0.09 | -0.04 | -0.05 | 0.15 | 100 | -0.05 |
| Financial Acumen | 3 | 196 | 65 | -0.10* | 0.02 | -0.14* | -0.19* | 0.04 | 100 | -0.19 |
| Flexibility | 8 | 754 | 94 | 0.04 | 0.08 | 0.06 | 0.08 | 0.16 | 100 | 0.08 |
| Goal Setting | 2 | 225 | 113 | 0.00 | 0.02 | 0.00 | -0.01 | 0.03 | 100 | -0.01 |
| Industry Knowledge | 4 | 913 | 228 | -0.02 | 0.04 | -0.03 | -0.04 | 0.08 | 100 | -0.04 |
| Influence | 7 | 551 | 79 | -0.02 | 0.12 | -0.02 | -0.02 | 0.22 | 94 | -0.11 |
| Information Analysis | 3 | 344 | 115 | -0.04 | 0.06 | -0.05 | -0.07 | 0.11 | 100 | -0.07 |
| Initiative | 6 | 1469 | 245 | 0.06 | 0.09 | 0.08 | 0.11 | 0.14 | 53 | -0.02 |
| Innovation | 8 | 1514 | 189 | -0.04 | 0.07 | -0.05 | -0.07 | 0.13 | 100 | -0.07 |
| Interpersonal Skills | 4 | 233 | 58 | 0.05 | 0.09 | 0.07 | 0.09 | 0.17 | 100 | 0.09 |
| Intrapersonal Skills | 2 | 839 | 420 | 0.04 | 0.09 | 0.05 | 0.06 | 0.14 | 41 | -0.11 |
| Leadership | 19 | 2437 | 128 | 0.02 | 0.11 | 0.03 | 0.04 | 0.19 | 70 | -0.13 |
| Managing Change | 4 | 355 | 89 | -0.04 | 0.11 | -0.06 | -0.07 | 0.17 | 100 | -0.07 |
| Managing Performance | 6 | 209 | 35 | -0.03 | 0.22 | -0.03 | -0.04 | 0.36 | 67 | -0.33 |
| Motivating Others | 5 | 473 | 95 | -0.04 | 0.06 | -0.05 | -0.06 | 0.12 | 100 | -0.06 |
| Negotiation | 5 | 581 | 116 | -0.07* | 0.04 | -0.09* | -0.12* | 0.05 | 100 | -0.12 |
| Oral Communication | 11 | 1248 | 113 | -0.03 | 0.09 | -0.04 | -0.06 | 0.16 | 100 | -0.06 |
| Organizational Commitment | 2 | 42 | 21 | -0.30 | 0.30 | -0.38 | -0.51 | 0.48 | 61 | -1.00 |
| Planning/Organizing | 7 | 782 | 112 | 0.01 | 0.09 | 0.01 | 0.02 | 0.16 | 100 | 0.02 |
| Problem Solving | 5 | 465 | 93 | -0.06 | 0.16 | -0.08 | -0.09 | 0.22 | 49 | -0.29 |
| Professionalism | 4 | 1283 | 321 | 0.08* | 0.06 | 0.11* | 0.14* | 0.10 | 100 | 0.14 |
| Quality Orientation | 7 | 456 | 65 | 0.01 | 0.09 | 0.02 | 0.02 | 0.16 | 100 | 0.02 |
| Resource Management | 3 | 378 | 126 | 0.02 | 0.07 | 0.03 | 0.04 | 0.14 | 100 | 0.04 |
| Risk Management | 4 | 128 | 32 | -0.02 | 0.18 | -0.01 | -0.02 | 0.35 | 86 | -0.24 |
| Safety | 5 | 345 | 69 | 0.05 | 0.08 | 0.07 | 0.09 | 0.15 | 100 | 0.09 |
| Sales Ability | 3 | 178 | 59 | 0.04 | 0.05 | 0.04 | 0.06 | 0.08 | 100 | 0.06 |
| Self Development | 8 | 761 | 95 | 0.01 | 0.09 | 0.01 | 0.02 | 0.16 | 100 | 0.02 |
| Service Orientation | 12 | 1511 | 126 | 0.04 | 0.07 | 0.04 | 0.05 | 0.12 | 100 | 0.05 |
| Strategic Planning | 10 | 1161 | 116 | 0.01 | 0.09 | 0.01 | 0.02 | 0.15 | 100 | 0.02 |
| Stress Tolerance | 10 | 1096 | 110 | -0.02 | 0.11 | -0.01 | -0.02 | 0.21 | 70 | -0.21 |
| Talent Management | 4 | 287 | 72 | 0.00 | 0.06 | 0.00 | 0.00 | 0.09 | 100 | 0.00 |
| Teamwork | 9 | 1939 | 215 | 0.04 | 0.10 | 0.06 | 0.08 | 0.19 | 43 | -0.16 |
| Trustworthiness | 17 | 1414 | 83 | 0.00 | 0.09 | 0.01 | 0.01 | 0.16 | 100 | 0.01 |
| Valuing Diversity | 7 | 491 | 70 | -0.07* | 0.10 | -0.09* | -0.12* | 0.17 | 100 | -0.12 |
| Work Attitude | 10 | 857 | 86 | -0.03 | 0.13 | -0.04 | -0.05 | 0.22 | 82 | -0.20 |
| Work Ethic | 2 | 350 | 175 | 0.03 | 0.12 | 0.03 | 0.04 | 0.21 | 46 | -0.21 |
| Work Skills | 6 | 529 | 88 | 0.02 | 0.13 | 0.03 | 0.04 | 0.21 | 89 | -0.08 |
| Dutiful | | | | | | | | | | |
| Achievement Orientation | 16 | 1194 | 75 | -0.04 | 0.11 | -0.06 | -0.09 | 0.24 | 95 | -0.18 |
| Active Listening | 3 | 349 | 116 | -0.02 | 0.06 | -0.03 | -0.05 | 0.13 | 100 | -0.05 |
| Building Relationships | 7 | 656 | 94 | 0.02 | 0.13 | 0.04 | 0.06 | 0.27 | 61 | -0.22 |
| Building Teams | 5 | 261 | 52 | 0.12* | 0.09 | 0.17* | 0.25* | 0.22 | 100 | 0.24 |
| Business Acumen | 7 | 668 | 95 | -0.02 | 0.10 | -0.03 | -0.05 | 0.21 | 100 | -0.05 |
| Caring | 2 | 249 | 125 | 0.04 | 0.01 | 0.05 | 0.08 | 0.01 | 100 | 0.08 |
| Citizenship | 6 | 218 | 36 | 0.10* | 0.11 | 0.14* | 0.21* | 0.23 | 100 | 0.21 |
| Decision Making | 15 | 1484 | 99 | -0.02 | 0.09 | -0.03 | -0.04 | 0.21 | 99 | -0.07 |
| Delegation | 2 | 398 | 199 | -0.01 | 0.04 | -0.02 | -0.03 | 0.07 | 100 | -0.03 |
| Dependability | 8 | 788 | 99 | 0.06 | 0.11 | 0.08 | 0.12 | 0.23 | 78 | -0.05 |
| Detail Orientation | 4 | 369 | 92 | 0.11* | 0.04 | 0.14* | 0.21* | 0.07 | 100 | 0.21 |
| Employee Development | 8 | 1000 | 125 | 0.00 | 0.08 | 0.00 | 0.01 | 0.16 | 100 | 0.01 |
| Financial Acumen | 3 | 196 | 65 | -0.11 | 0.11 | -0.16 | -0.24 | 0.25 | 100 | -0.24 |
| Flexibility | 8 | 754 | 94 | 0.06 | 0.09 | 0.09 | 0.13 | 0.19 | 100 | 0.13 |
| Goal Setting | 2 | 225 | 113 | -0.08 | 0.10 | -0.11 | -0.16 | 0.21 | 90 | -0.27 |
| Industry Knowledge | 4 | 913 | 228 | -0.02* | 0.03 | -0.03* | -0.04* | 0.06 | 100 | -0.04 |
| Influence | 7 | 551 | 79 | -0.03 | 0.11 | -0.05 | -0.07 | 0.23 | 96 | -0.15 |
| Information Analysis | 3 | 344 | 115 | -0.07 | 0.08 | -0.10 | -0.14 | 0.17 | 100 | -0.14 |
| Initiative | 6 | 1469 | 245 | -0.03 | 0.07 | -0.04 | -0.06 | 0.14 | 81 | -0.17 |
| Innovation | 8 | 1514 | 189 | -0.02 | 0.07 | -0.02 | -0.03 | 0.15 | 100 | -0.03 |
| Interpersonal Skills | 4 | 233 | 58 | 0.19* | 0.13 | 0.26* | 0.39* | 0.23 | 100 | 0.39 |

## Appendix C: Complete Meta-Analysis Results for HDS Scales Aligned with Competency Domains and Criteria (Continued)

| **Intrapersonal Domain** | K | N | Avg N | r obs | $SD_r$ | $\rho_v$ | ρ | $SD_\rho$ | %VE | 90% CV |
|---|---|---|---|---|---|---|---|---|---|---|
| Dutiful (Continued) | | | | | | | | | | |
| Intrapersonal Skills | 2 | 839 | 420 | 0.08* | 0.04 | 0.11* | 0.16* | 0.08 | 100 | 0.16 |
| Leadership | 19 | 2437 | 128 | -0.02 | 0.09 | -0.03 | -0.05 | 0.19 | 91 | -0.14 |
| Managing Change | 4 | 355 | 89 | -0.10 | 0.13 | -0.14 | -0.20 | 0.28 | 60 | -0.49 |
| Managing Performance | 6 | 209 | 35 | 0.05 | 0.19 | 0.09 | 0.14 | 0.41 | 69 | -0.24 |
| Motivating Others | 5 | 473 | 95 | -0.05 | 0.10 | -0.07 | -0.10 | 0.20 | 100 | -0.10 |
| Negotiation | 5 | 581 | 116 | -0.09 | 0.16 | -0.13 | -0.18 | 0.33 | 31 | -0.64 |
| Oral Communication | 11 | 1248 | 113 | 0.00 | 0.08 | 0.00 | 0.00 | 0.17 | 100 | 0.00 |
| Organizational Commitment | 2 | 42 | 21 | -0.25* | 0.07 | -0.32* | -0.48* | 0.17 | 100 | -0.47 |
| Planning/Organizing | 7 | 782 | 112 | -0.01 | 0.10 | 0.00 | -0.01 | 0.21 | 83 | -0.15 |
| Problem Solving | 5 | 465 | 93 | 0.01 | 0.15 | 0.01 | 0.02 | 0.31 | 46 | -0.35 |
| Professionalism | 4 | 1283 | 321 | 0.00 | 0.07 | 0.00 | 0.00 | 0.14 | 70 | -0.12 |
| Quality Orientation | 7 | 456 | 65 | 0.00 | 0.17 | -0.01 | -0.01 | 0.35 | 52 | -0.41 |
| Resource Management | 3 | 378 | 126 | 0.01 | 0.10 | 0.00 | 0.01 | 0.20 | 82 | -0.14 |
| Risk Management | 4 | 128 | 32 | -0.12 | 0.19 | -0.19 | -0.28 | 0.44 | 65 | -0.71 |
| Safety | 5 | 345 | 69 | 0.11* | 0.09 | 0.15* | 0.22* | 0.17 | 100 | 0.22 |
| Sales Ability | 3 | 178 | 59 | -0.07 | 0.12 | -0.10 | -0.14 | 0.24 | 100 | -0.14 |
| Self Development | 8 | 761 | 95 | 0.04 | 0.10 | 0.05 | 0.07 | 0.20 | 100 | 0.07 |
| Service Orientation | 12 | 1511 | 126 | 0.04 | 0.08 | 0.05 | 0.08 | 0.16 | 100 | 0.08 |
| Strategic Planning | 10 | 1161 | 116 | -0.01 | 0.11 | -0.01 | -0.01 | 0.24 | 65 | -0.24 |
| Stress Tolerance | 10 | 1096 | 110 | 0.07 | 0.10 | 0.09 | 0.13 | 0.22 | 82 | -0.02 |
| Talent Management | 4 | 287 | 72 | -0.09 | 0.17 | -0.14 | -0.21 | 0.38 | 40 | -0.68 |
| Teamwork | 9 | 1939 | 215 | 0.03 | 0.05 | 0.05 | 0.07 | 0.11 | 100 | 0.07 |
| Trustworthiness | 17 | 1414 | 83 | 0.03 | 0.13 | 0.04 | 0.07 | 0.27 | 71 | -0.17 |
| Valuing Diversity | 7 | 491 | 70 | 0.05 | 0.15 | 0.07 | 0.11 | 0.33 | 56 | -0.25 |
| Work Attitude | 10 | 857 | 86 | 0.00 | 0.09 | 0.00 | 0.00 | 0.20 | 100 | 0.00 |
| Work Ethic | 2 | 350 | 175 | 0.04 | 0.11 | 0.06 | 0.09 | 0.23 | 46 | -0.18 |
| Work Skills | 6 | 529 | 88 | 0.01 | 0.22 | 0.01 | 0.02 | 0.45 | 23 | -0.63 |
| **Interpersonal Domain** | | | | | | | | | | |
| Reserved | | | | | | | | | | |
| Achievement Orientation | 16 | 1194 | 75 | -0.03 | 0.16 | -0.05 | -0.06 | 0.28 | 54 | -0.38 |
| Active Listening | 3 | 349 | 116 | -0.10* | 0.04 | -0.12* | -0.16* | 0.07 | 100 | -0.16 |
| Building Relationships | 7 | 656 | 94 | -0.09* | 0.08 | -0.12* | -0.16* | 0.15 | 100 | -0.16 |
| Building Teams | 5 | 261 | 52 | 0.00 | 0.09 | -0.02 | -0.02 | 0.18 | 100 | -0.02 |
| Business Acumen | 7 | 668 | 95 | 0.05 | 0.16 | 0.06 | 0.08 | 0.27 | 46 | -0.25 |
| Caring | 2 | 249 | 125 | -0.13* | 0.06 | -0.17* | -0.22* | 0.09 | 100 | -0.22 |
| Citizenship | 6 | 218 | 36 | 0.00 | 0.10 | -0.01 | -0.01 | 0.18 | 100 | -0.01 |
| Decision Making | 15 | 1484 | 99 | -0.02 | 0.11 | -0.02 | -0.03 | 0.18 | 100 | -0.03 |
| Delegation | 2 | 398 | 199 | -0.02 | 0.03 | -0.03 | -0.03 | 0.05 | 100 | -0.03 |
| Dependability | 8 | 788 | 99 | -0.07 | 0.12 | -0.09 | -0.12 | 0.19 | 98 | -0.17 |
| Detail Orientation | 4 | 369 | 92 | -0.01 | 0.16 | 0.00 | 0.00 | 0.25 | 58 | -0.27 |
| Employee Development | 8 | 1000 | 125 | -0.06* | 0.06 | -0.08* | -0.11* | 0.11 | 100 | -0.11 |
| Financial Acumen | 3 | 196 | 65 | 0.02 | 0.22 | 0.03 | 0.04 | 0.38 | 33 | -0.47 |
| Flexibility | 8 | 754 | 94 | -0.06* | 0.08 | -0.09* | -0.12* | 0.14 | 100 | -0.12 |
| Goal Setting | 2 | 225 | 113 | 0.01 | 0.08 | 0.00 | 0.00 | 0.18 | 99 | -0.03 |
| Industry Knowledge | 4 | 913 | 228 | 0.00 | 0.09 | 0.00 | 0.01 | 0.16 | 54 | -0.18 |
| Influence | 7 | 551 | 79 | -0.05 | 0.11 | -0.07 | -0.09 | 0.19 | 100 | -0.09 |
| Information Analysis | 3 | 344 | 115 | 0.01 | 0.05 | 0.01 | 0.01 | 0.09 | 100 | 0.01 |
| Initiative | 6 | 1469 | 245 | 0.00 | 0.04 | 0.00 | 0.00 | 0.08 | 100 | 0.00 |
| Innovation | 8 | 1514 | 189 | -0.01 | 0.09 | -0.02 | -0.02 | 0.15 | 75 | -0.15 |
| Interpersonal Skills | 4 | 233 | 58 | -0.17 | 0.22 | -0.22 | -0.30 | 0.36 | 42 | -0.74 |
| Intrapersonal Skills | 2 | 839 | 420 | -0.03 | 0.06 | -0.04 | -0.06 | 0.08 | 100 | -0.06 |
| Leadership | 19 | 2437 | 128 | -0.03 | 0.10 | -0.04 | -0.05 | 0.18 | 85 | -0.16 |
| Managing Change | 4 | 355 | 89 | 0.02 | 0.06 | 0.02 | 0.03 | 0.11 | 100 | 0.03 |
| Managing Performance | 6 | 209 | 35 | -0.11 | 0.26 | -0.15 | -0.20 | 0.43 | 52 | -0.69 |
| Motivating Others | 5 | 473 | 95 | -0.07* | 0.05 | -0.09* | -0.12* | 0.11 | 100 | -0.12 |
| Negotiation | 5 | 581 | 116 | -0.08 | 0.11 | -0.09 | -0.12 | 0.18 | 96 | -0.18 |
| Oral Communication | 11 | 1248 | 113 | -0.08* | 0.10 | -0.11* | -0.15* | 0.18 | 92 | -0.23 |
| Organizational Commitment | 2 | 42 | 21 | 0.15* | 0.10 | 0.23* | 0.31* | 0.17 | 100 | 0.31 |
| Planning/Organizing | 7 | 782 | 112 | -0.02 | 0.15 | -0.03 | -0.05 | 0.27 | 41 | -0.38 |

## Appendix C: Complete Meta-Analysis Results for HDS Scales Aligned with Competency Domains and Criteria (Continued)

| **Interpersonal Domain** | K | N | Avg N | r obs | $SD_r$ | $\rho_v$ | ρ | $SD_\rho$ | %VE | 90% CV |
|---|---|---|---|---|---|---|---|---|---|---|
| Reserved (Continued) | | | | | | | | | | |
| Problem Solving | 5 | 465 | 93 | 0.02 | 0.07 | 0.03 | 0.03 | 0.14 | 100 | 0.03 |
| Professionalism | 4 | 1283 | 321 | -0.02 | 0.03 | -0.03 | -0.04 | 0.06 | 100 | -0.04 |
| Quality Orientation | 7 | 456 | 65 | -0.04 | 0.14 | -0.06 | -0.08 | 0.26 | 77 | -0.29 |
| Resource Management | 3 | 378 | 126 | 0.06 | 0.10 | 0.08 | 0.11 | 0.17 | 94 | 0.04 |
| Risk Management | 4 | 128 | 32 | -0.14 | 0.28 | -0.19 | -0.26 | 0.49 | 40 | -0.88 |
| Safety | 5 | 345 | 69 | -0.14* | 0.07 | -0.17* | -0.23* | 0.16 | 100 | -0.23 |
| Sales Ability | 3 | 178 | 59 | -0.04 | 0.07 | -0.06 | -0.08 | 0.13 | 100 | -0.08 |
| Self Development | 8 | 761 | 95 | -0.06* | 0.07 | -0.08* | -0.10* | 0.12 | 100 | -0.10 |
| Service Orientation | 12 | 1511 | 126 | -0.10* | 0.10 | -0.12* | -0.16* | 0.17 | 90 | -0.25 |
| Strategic Planning | 10 | 1161 | 116 | -0.04 | 0.12 | -0.06 | -0.08 | 0.20 | 70 | -0.26 |
| Stress Tolerance | 10 | 1096 | 110 | -0.06* | 0.10 | -0.07* | -0.10* | 0.17 | 100 | -0.10 |
| Talent Management | 4 | 287 | 72 | -0.02 | 0.14 | -0.03 | -0.04 | 0.25 | 74 | -0.25 |
| Teamwork | 9 | 1939 | 215 | -0.03 | 0.09 | -0.04 | -0.05 | 0.16 | 63 | -0.21 |
| Trustworthiness | 17 | 1414 | 83 | -0.02 | 0.13 | -0.03 | -0.04 | 0.23 | 75 | -0.23 |
| Valuing Diversity | 7 | 491 | 70 | -0.02 | 0.17 | -0.03 | -0.04 | 0.29 | 54 | -0.37 |
| Work Attitude | 10 | 857 | 86 | -0.15* | 0.16 | -0.20* | -0.26* | 0.25 | 59 | -0.53 |
| Work Ethic | 2 | 350 | 175 | 0.01 | 0.00 | 0.01 | 0.01 | 0.00 | 100 | 0.01 |
| Work Skills | 6 | 529 | 88 | 0.03 | 0.11 | 0.04 | 0.05 | 0.22 | 81 | -0.10 |
| Mischievous | | | | | | | | | | |
| Achievement Orientation | 16 | 1194 | 75 | 0.00 | 0.12 | 0.00 | 0.00 | 0.24 | 74 | -0.20 |
| Active Listening | 3 | 349 | 116 | -0.03 | 0.12 | -0.04 | -0.05 | 0.21 | 63 | -0.26 |
| Building Relationships | 7 | 656 | 94 | 0.02 | 0.08 | 0.03 | 0.03 | 0.15 | 100 | 0.03 |
| Building Teams | 5 | 261 | 52 | -0.03 | 0.20 | -0.05 | -0.06 | 0.40 | 38 | -0.58 |
| Business Acumen | 7 | 668 | 95 | 0.01 | 0.15 | 0.02 | 0.03 | 0.29 | 42 | -0.33 |
| Caring | 2 | 249 | 125 | 0.00 | 0.20 | -0.02 | -0.01 | 0.44 | 8 | -0.70 |
| Citizenship | 6 | 218 | 36 | -0.06 | 0.17 | -0.10 | -0.14 | 0.35 | 69 | -0.46 |
| Decision Making | 15 | 1484 | 99 | -0.02 | 0.09 | -0.03 | -0.04 | 0.19 | 94 | -0.12 |
| Delegation | 2 | 398 | 199 | -0.04 | 0.10 | -0.06 | -0.07 | 0.21 | 39 | -0.34 |
| Dependability | 8 | 788 | 99 | -0.14* | 0.12 | -0.21* | -0.27* | 0.24 | 50 | -0.54 |
| Detail Orientation | 4 | 369 | 92 | -0.01 | 0.07 | -0.02 | -0.03 | 0.14 | 100 | -0.03 |
| Employee Development | 8 | 1000 | 125 | 0.03 | 0.11 | 0.04 | 0.06 | 0.22 | 52 | -0.19 |
| Financial Acumen | 3 | 196 | 65 | -0.07 | 0.11 | -0.12 | -0.15 | 0.24 | 82 | -0.32 |
| Flexibility | 8 | 754 | 94 | -0.02 | 0.12 | -0.03 | -0.04 | 0.24 | 61 | -0.28 |
| Goal Setting | 2 | 225 | 113 | -0.06* | 0.04 | -0.09* | -0.12* | 0.07 | 100 | -0.12 |
| Industry Knowledge | 4 | 913 | 228 | 0.04* | 0.02 | 0.06* | 0.08* | 0.04 | 100 | 0.08 |
| Influence | 7 | 551 | 79 | 0.04 | 0.09 | 0.06 | 0.08 | 0.18 | 100 | 0.08 |
| Information Analysis | 3 | 344 | 115 | 0.00 | 0.02 | 0.01 | 0.01 | 0.05 | 100 | 0.01 |
| Initiative | 6 | 1469 | 245 | -0.03 | 0.07 | -0.04 | -0.05 | 0.15 | 62 | -0.20 |
| Innovation | 8 | 1514 | 189 | 0.03 | 0.04 | 0.04 | 0.05 | 0.08 | 100 | 0.05 |
| Interpersonal Skills | 4 | 233 | 58 | 0.05 | 0.10 | 0.07 | 0.09 | 0.21 | 100 | 0.09 |
| Intrapersonal Skills | 2 | 839 | 420 | -0.06* | 0.03 | -0.08* | -0.11* | 0.06 | 100 | -0.11 |
| Leadership | 19 | 2437 | 128 | -0.04* | 0.08 | -0.06* | -0.08* | 0.17 | 84 | -0.20 |
| Managing Change | 4 | 355 | 89 | 0.05 | 0.17 | 0.08 | 0.10 | 0.35 | 29 | -0.38 |
| Managing Performance | 6 | 209 | 35 | 0.05 | 0.18 | 0.08 | 0.10 | 0.36 | 72 | -0.21 |
| Motivating Others | 5 | 473 | 95 | 0.09 | 0.10 | 0.14 | 0.18 | 0.21 | 74 | 0.00 |
| Negotiation | 5 | 581 | 116 | 0.03 | 0.11 | 0.03 | 0.04 | 0.25 | 38 | -0.28 |
| Oral Communication | 11 | 1248 | 113 | -0.01 | 0.10 | -0.02 | -0.03 | 0.20 | 74 | -0.19 |
| Organizational Commitment | 2 | 42 | 21 | 0.21* | 0.09 | 0.31* | 0.40* | 0.17 | 100 | 0.40 |
| Planning/Organizing | 7 | 782 | 112 | -0.01 | 0.10 | 0.00 | -0.01 | 0.18 | 91 | -0.09 |
| Problem Solving | 5 | 465 | 93 | 0.06 | 0.09 | 0.09 | 0.12 | 0.17 | 100 | 0.12 |
| Professionalism | 4 | 1283 | 321 | -0.03 | 0.10 | -0.05 | -0.07 | 0.20 | 24 | -0.36 |
| Quality Orientation | 7 | 456 | 65 | 0.02 | 0.08 | 0.02 | 0.03 | 0.17 | 100 | 0.03 |
| Resource Management | 3 | 378 | 126 | 0.01 | 0.09 | 0.02 | 0.03 | 0.18 | 84 | -0.09 |
| Risk Management | 4 | 128 | 32 | 0.14* | 0.10 | 0.23* | 0.29* | 0.21 | 100 | 0.29 |
| Safety | 5 | 345 | 69 | 0.02 | 0.13 | 0.02 | 0.03 | 0.25 | 75 | -0.17 |
| Sales Ability | 3 | 178 | 59 | -0.02 | 0.13 | -0.04 | -0.05 | 0.24 | 94 | -0.15 |
| Self Development | 8 | 761 | 95 | -0.01 | 0.11 | -0.01 | -0.02 | 0.20 | 85 | -0.15 |
| Service Orientation | 12 | 1511 | 126 | 0.01 | 0.06 | 0.02 | 0.02 | 0.12 | 100 | 0.02 |
| Strategic Planning | 10 | 1161 | 116 | 0.06* | 0.09 | 0.09* | 0.12* | 0.18 | 82 | -0.01 |

## Appendix C: Complete Meta-Analysis Results for HDS Scales Aligned with Competency Domains and Criteria (Continued)

| **Interpersonal Domain** | K | N | Avg N | r obs | $SD_r$ | $\rho_v$ | ρ | $SD_\rho$ | %VE | 90% CV |
|---|---|---|---|---|---|---|---|---|---|---|
| Mischievous (Continued) | | | | | | | | | | |
| Stress Tolerance | 10 | 1096 | 110 | -0.05 | 0.12 | -0.07 | -0.10 | 0.23 | 55 | -0.35 |
| Talent Management | 4 | 287 | 72 | -0.06 | 0.11 | -0.09 | -0.12 | 0.24 | 78 | -0.30 |
| Teamwork | 9 | 1939 | 215 | -0.06* | 0.09 | -0.09* | -0.12* | 0.19 | 44 | -0.34 |
| Trustworthiness | 17 | 1414 | 83 | -0.08* | 0.08 | -0.12* | -0.16* | 0.17 | 100 | -0.16 |
| Valuing Diversity | 7 | 491 | 70 | -0.08 | 0.12 | -0.11 | -0.15 | 0.25 | 70 | -0.38 |
| Work Attitude | 10 | 857 | 86 | -0.03 | 0.14 | -0.04 | -0.06 | 0.28 | 48 | -0.39 |
| Work Ethic | 2 | 350 | 175 | 0.03* | 0.01 | 0.05* | 0.06* | 0.02 | 100 | 0.06 |
| Work Skills | 6 | 529 | 88 | 0.08 | 0.10 | 0.12 | 0.16 | 0.20 | 96 | 0.09 |
| Colorful | | | | | | | | | | |
| Achievement Orientation | 16 | 1194 | 75 | -0.03 | 0.10 | -0.04 | -0.05 | 0.17 | 100 | -0.05 |
| Active Listening | 3 | 349 | 116 | 0.01 | 0.14 | 0.01 | 0.02 | 0.22 | 50 | -0.24 |
| Building Relationships | 7 | 656 | 94 | 0.08 | 0.16 | 0.11 | 0.13 | 0.25 | 47 | -0.17 |
| Building Teams | 5 | 261 | 52 | 0.00 | 0.12 | 0.00 | 0.00 | 0.19 | 100 | 0.00 |
| Business Acumen | 7 | 668 | 95 | -0.07* | 0.08 | -0.10* | -0.12* | 0.16 | 100 | -0.12 |
| Caring | 2 | 249 | 125 | 0.04 | 0.00 | 0.05 | 0.06 | 0.00 | 100 | 0.06 |
| Citizenship | 6 | 218 | 36 | -0.02 | 0.23 | -0.03 | -0.02 | 0.33 | 44 | -0.34 |
| Decision Making | 15 | 1484 | 99 | -0.05 | 0.12 | -0.07 | -0.08 | 0.21 | 61 | -0.30 |
| Delegation | 2 | 398 | 199 | 0.00 | 0.06 | -0.01 | -0.01 | 0.10 | 100 | -0.01 |
| Dependability | 8 | 788 | 99 | -0.09* | 0.07 | -0.12* | -0.14* | 0.10 | 100 | -0.14 |
| Detail Orientation | 4 | 369 | 92 | -0.04 | 0.07 | -0.04 | -0.05 | 0.11 | 100 | -0.05 |
| Employee Development | 8 | 1000 | 125 | 0.02 | 0.11 | 0.03 | 0.04 | 0.17 | 82 | -0.08 |
| Financial Acumen | 3 | 196 | 65 | -0.15 | 0.18 | -0.23 | -0.27 | 0.33 | 26 | -0.70 |
| Flexibility | 8 | 754 | 94 | 0.02 | 0.09 | 0.02 | 0.03 | 0.15 | 100 | 0.03 |
| Goal Setting | 2 | 225 | 113 | -0.12* | 0.06 | -0.16* | -0.20* | 0.10 | 100 | -0.20 |
| Industry Knowledge | 4 | 913 | 228 | 0.07 | 0.11 | 0.09 | 0.11 | 0.21 | 27 | -0.18 |
| Influence | 7 | 551 | 79 | 0.00 | 0.15 | -0.01 | -0.01 | 0.27 | 49 | -0.32 |
| Information Analysis | 3 | 344 | 115 | -0.02 | 0.08 | -0.03 | -0.04 | 0.14 | 100 | -0.04 |
| Initiative | 6 | 1469 | 245 | 0.00 | 0.09 | 0.00 | 0.00 | 0.14 | 58 | -0.15 |
| Innovation | 8 | 1514 | 189 | 0.03* | 0.02 | 0.04* | 0.05* | 0.04 | 100 | 0.05 |
| Interpersonal Skills | 4 | 233 | 58 | 0.03 | 0.10 | 0.04 | 0.05 | 0.16 | 100 | 0.05 |
| Intrapersonal Skills | 2 | 839 | 420 | -0.04 | 0.00 | -0.06 | -0.07 | 0.00 | 100 | -0.07 |
| Leadership | 19 | 2437 | 128 | 0.00 | 0.07 | 0.00 | 0.00 | 0.12 | 100 | 0.00 |
| Managing Change | 4 | 355 | 89 | -0.02 | 0.12 | -0.04 | -0.04 | 0.19 | 90 | -0.14 |
| Managing Performance | 6 | 209 | 35 | -0.01 | 0.10 | -0.01 | -0.01 | 0.17 | 100 | -0.01 |
| Motivating Others | 5 | 473 | 95 | 0.10* | 0.07 | 0.13* | 0.16* | 0.11 | 100 | 0.16 |
| Negotiation | 5 | 581 | 116 | 0.02 | 0.07 | 0.02 | 0.03 | 0.12 | 100 | 0.03 |
| Oral Communication | 11 | 1248 | 113 | 0.00 | 0.08 | 0.00 | 0.00 | 0.13 | 100 | 0.00 |
| Organizational Commitment | 2 | 42 | 21 | 0.08 | 0.01 | 0.11 | 0.13 | 0.00 | 100 | 0.13 |
| Planning/Organizing | 7 | 782 | 112 | -0.04 | 0.09 | -0.05 | -0.07 | 0.16 | 100 | -0.07 |
| Problem Solving | 5 | 465 | 93 | 0.01 | 0.08 | 0.01 | 0.02 | 0.12 | 100 | 0.02 |
| Professionalism | 4 | 1283 | 321 | 0.00 | 0.06 | 0.00 | 0.00 | 0.11 | 81 | -0.07 |
| Quality Orientation | 7 | 456 | 65 | -0.07 | 0.12 | -0.10 | -0.12 | 0.21 | 97 | -0.18 |
| Resource Management | 3 | 378 | 126 | 0.00 | 0.09 | 0.00 | -0.01 | 0.13 | 100 | -0.01 |
| Risk Management | 4 | 128 | 32 | -0.03 | 0.19 | -0.07 | -0.08 | 0.39 | 55 | -0.51 |
| Safety | 5 | 345 | 69 | -0.05 | 0.18 | -0.05 | -0.06 | 0.29 | 39 | -0.42 |
| Sales Ability | 3 | 178 | 59 | -0.02 | 0.04 | -0.02 | -0.02 | 0.07 | 100 | -0.02 |
| Self Development | 8 | 761 | 95 | -0.01 | 0.10 | -0.01 | -0.01 | 0.17 | 100 | -0.01 |
| Service Orientation | 12 | 1511 | 126 | 0.03 | 0.09 | 0.05 | 0.06 | 0.15 | 100 | 0.06 |
| Strategic Planning | 10 | 1161 | 116 | 0.01 | 0.09 | 0.01 | 0.01 | 0.15 | 100 | 0.01 |
| Stress Tolerance | 10 | 1096 | 110 | -0.06* | 0.07 | -0.08* | -0.10* | 0.13 | 100 | -0.10 |
| Talent Management | 4 | 287 | 72 | -0.09 | 0.10 | -0.12 | -0.15 | 0.18 | 100 | -0.15 |
| Teamwork | 9 | 1939 | 215 | -0.04 | 0.08 | -0.05 | -0.06 | 0.14 | 68 | -0.19 |
| Trustworthiness | 17 | 1414 | 83 | -0.11* | 0.10 | -0.15* | -0.19* | 0.16 | 100 | -0.19 |
| Valuing Diversity | 7 | 491 | 70 | -0.03 | 0.08 | -0.04 | -0.05 | 0.14 | 100 | -0.05 |
| Work Attitude | 10 | 857 | 86 | 0.04 | 0.18 | 0.04 | 0.05 | 0.31 | 32 | -0.37 |
| Work Ethic | 2 | 350 | 175 | -0.05* | 0.02 | -0.06* | -0.08* | 0.03 | 100 | -0.08 |
| Work Skills | 6 | 529 | 88 | -0.05* | 0.06 | -0.07* | -0.08* | 0.10 | 100 | -0.08 |

## Appendix C: Complete Meta-Analysis Results for HDS Scales Aligned with Competency Domains and Criteria (Continued)

| Business Domain | K | N | Avg N | r obs | $SD_r$ | $\rho_v$ | ρ | $SD_\rho$ | %VE | 90% CV |
|---|---|---|---|---|---|---|---|---|---|---|
| Skeptical | | | | | | | | | | |
| Achievement Orientation | 16 | 1194 | 75 | -0.06* | 0.12 | -0.08* | -0.11* | 0.24 | 73 | -0.31 |
| Active Listening | 3 | 349 | 116 | -0.11* | 0.01 | -0.16* | -0.20* | 0.02 | 100 | -0.20 |
| Building Relationships | 7 | 656 | 94 | -0.05 | 0.08 | -0.07 | -0.09 | 0.17 | 100 | -0.09 |
| Building Teams | 5 | 261 | 52 | -0.08 | 0.13 | -0.14 | -0.17 | 0.26 | 86 | -0.33 |
| Business Acumen | 7 | 668 | 95 | 0.02 | 0.16 | 0.03 | 0.04 | 0.17 | 100 | 0.04 |
| Caring | 2 | 249 | 125 | -0.07 | 0.19 | -0.09 | -0.12 | 0.29 | 26 | -0.53 |
| Citizenship | 6 | 218 | 36 | -0.15* | 0.18 | -0.25* | -0.29* | 0.36 | 43 | -0.66 |
| Decision Making | 15 | 1484 | 99 | -0.07* | 0.09 | -0.10* | -0.13* | 0.20 | 69 | -0.29 |
| Delegation | 2 | 398 | 199 | -0.03 | 0.07 | -0.04 | -0.05 | 0.11 | 100 | -0.05 |
| Dependability | 8 | 788 | 99 | -0.11* | 0.09 | -0.16* | -0.20* | 0.19 | 81 | -0.34 |
| Detail Orientation | 4 | 369 | 92 | -0.06 | 0.08 | -0.09 | -0.12 | 0.21 | 73 | -0.29 |
| Employee Development | 8 | 1000 | 125 | -0.03 | 0.09 | -0.05 | -0.06 | 0.15 | 100 | -0.06 |
| Financial Acumen | 3 | 196 | 65 | -0.16* | 0.03 | -0.24* | -0.31* | 0.04 | 100 | -0.31 |
| Flexibility | 8 | 754 | 94 | -0.07* | 0.10 | -0.11* | -0.14* | 0.21 | 74 | -0.32 |
| Goal Setting | 2 | 225 | 113 | -0.13* | 0.07 | -0.20* | -0.25* | 0.20 | 60 | -0.47 |
| Industry Knowledge | 4 | 913 | 228 | -0.05* | 0.03 | -0.07* | -0.09* | 0.06 | 100 | -0.09 |
| Influence | 7 | 551 | 79 | -0.04 | 0.08 | -0.05 | -0.07 | 0.18 | 100 | -0.07 |
| Information Analysis | 3 | 344 | 115 | 0.00 | 0.01 | 0.00 | 0.01 | 0.03 | 100 | 0.01 |
| Initiative | 6 | 1469 | 245 | -0.04 | 0.06 | -0.06 | -0.08 | 0.15 | 52 | -0.25 |
| Innovation | 8 | 1514 | 189 | -0.07* | 0.06 | -0.09* | -0.12* | 0.13 | 100 | -0.12 |
| Interpersonal Skills | 4 | 233 | 58 | -0.12* | 0.13 | -0.18* | -0.22* | 0.24 | 85 | -0.38 |
| Intrapersonal Skills | 2 | 839 | 420 | -0.04 | 0.06 | -0.05 | -0.07 | 0.11 | 56 | -0.19 |
| Leadership | 19 | 2437 | 128 | -0.09* | 0.08 | -0.13* | -0.17* | 0.16 | 89 | -0.26 |
| Managing Change | 4 | 355 | 89 | -0.10 | 0.18 | -0.14 | -0.18 | 0.37 | 23 | -0.72 |
| Managing Performance | 6 | 209 | 35 | -0.09 | 0.17 | -0.12 | -0.15 | 0.35 | 69 | -0.47 |
| Motivating Others | 5 | 473 | 95 | -0.03 | 0.11 | -0.06 | -0.07 | 0.21 | 71 | -0.26 |
| Negotiation | 5 | 581 | 116 | -0.06 | 0.10 | -0.08 | -0.11 | 0.16 | 100 | -0.11 |
| Oral Communication | 11 | 1248 | 113 | -0.09* | 0.06 | -0.13* | -0.16* | 0.11 | 100 | -0.16 |
| Organizational Commitment | 2 | 42 | 21 | -0.19* | 0.13 | -0.31* | -0.39* | 0.27 | 100 | -0.39 |
| Planning/Organizing | 7 | 782 | 112 | -0.08* | 0.06 | -0.11* | -0.14* | 0.12 | 100 | -0.14 |
| Problem Solving | 5 | 465 | 93 | -0.04 | 0.07 | -0.06 | -0.07 | 0.14 | 100 | -0.07 |
| Professionalism | 4 | 1283 | 321 | -0.06 | 0.07 | -0.09 | -0.11 | 0.14 | 51 | -0.27 |
| Quality Orientation | 7 | 456 | 65 | -0.08 | 0.12 | -0.12 | -0.15 | 0.26 | 69 | -0.39 |
| Resource Management | 3 | 378 | 126 | 0.02 | 0.02 | 0.03 | 0.03 | 0.04 | 100 | 0.03 |
| Risk Management | 4 | 128 | 32 | 0.09 | 0.12 | 0.13 | 0.17 | 0.25 | 100 | 0.17 |
| Safety | 5 | 345 | 69 | -0.02 | 0.14 | -0.02 | -0.02 | 0.28 | 52 | -0.35 |
| Sales Ability | 3 | 178 | 59 | -0.01 | 0.20 | -0.02 | -0.03 | 0.39 | 32 | -0.56 |
| Self Development | 8 | 761 | 95 | -0.04 | 0.06 | -0.05 | -0.07 | 0.13 | 100 | -0.07 |
| Service Orientation | 12 | 1511 | 126 | -0.06* | 0.09 | -0.08* | -0.11* | 0.19 | 66 | -0.28 |
| Strategic Planning | 10 | 1161 | 116 | -0.04 | 0.11 | -0.05 | -0.06 | 0.22 | 56 | -0.30 |
| Stress Tolerance | 10 | 1096 | 110 | -0.10* | 0.08 | -0.14* | -0.18* | 0.17 | 89 | -0.27 |
| Talent Management | 4 | 287 | 72 | 0.00 | 0.06 | 0.00 | 0.00 | 0.12 | 100 | 0.00 |
| Teamwork | 9 | 1939 | 215 | -0.07* | 0.07 | -0.09* | -0.11* | 0.14 | 76 | -0.22 |
| Trustworthiness | 17 | 1414 | 83 | -0.08* | 0.09 | -0.11* | -0.14* | 0.16 | 100 | -0.14 |
| Valuing Diversity | 7 | 491 | 70 | -0.06 | 0.13 | -0.09 | -0.10 | 0.26 | 47 | -0.38 |
| Work Attitude | 10 | 857 | 86 | -0.06 | 0.12 | -0.09 | -0.11 | 0.21 | 80 | -0.27 |
| Work Ethic | 2 | 350 | 175 | -0.02 | 0.03 | -0.03 | -0.03 | 0.05 | 100 | -0.03 |
| Work Skills | 6 | 529 | 88 | -0.09* | 0.11 | -0.13* | -0.17* | 0.24 | 55 | -0.44 |
| Leisurely | | | | | | | | | | |
| Achievement Orientation | 16 | 1194 | 75 | -0.09* | 0.15 | -0.13* | -0.19* | 0.33 | 54 | -0.56 |
| Active Listening | 3 | 349 | 116 | 0.02 | 0.05 | 0.02 | 0.04 | 0.10 | 100 | 0.04 |
| Building Relationships | 7 | 656 | 94 | -0.01 | 0.12 | -0.03 | -0.04 | 0.25 | 75 | -0.25 |
| Building Teams | 5 | 261 | 52 | -0.08* | 0.05 | -0.11* | -0.17* | 0.13 | 100 | -0.17 |
| Business Acumen | 7 | 668 | 95 | 0.00 | 0.08 | 0.01 | 0.01 | 0.16 | 100 | 0.01 |
| Caring | 2 | 249 | 125 | 0.02 | 0.13 | 0.02 | 0.03 | 0.22 | 73 | -0.16 |
| Citizenship | 6 | 218 | 36 | -0.05 | 0.22 | -0.03 | -0.05 | 0.47 | 48 | -0.58 |
| Decision Making | 15 | 1484 | 99 | -0.03 | 0.09 | -0.05 | -0.08 | 0.19 | 100 | -0.08 |
| Delegation | 2 | 398 | 199 | -0.06* | 0.03 | -0.08* | -0.12* | 0.07 | 100 | -0.12 |
| Dependability | 8 | 788 | 99 | -0.11* | 0.06 | -0.14* | -0.21* | 0.15 | 100 | -0.21 |

## Appendix C: Complete Meta-Analysis Results for HDS Scales Aligned with Competency Domains and Criteria (Continued)

| Business Domain | K | N | Avg N | r obs | $SD_r$ | $\rho_v$ | $\rho$ | $SD_\rho$ | %VE | 90% CV |
|---|---|---|---|---|---|---|---|---|---|---|
| Leisurely (Continued) | | | | | | | | | | |
| Detail Orientation | 4 | 369 | 92 | 0.00 | 0.12 | -0.04 | -0.05 | 0.24 | 82 | -0.23 |
| Employee Development | 8 | 1000 | 125 | 0.00 | 0.12 | -0.01 | -0.01 | 0.23 | 39 | -0.25 |
| Financial Acumen | 3 | 196 | 65 | -0.05 | 0.14 | -0.07 | -0.10 | 0.28 | 89 | -0.25 |
| Flexibility | 8 | 754 | 94 | -0.10* | 0.11 | -0.13* | -0.21* | 0.25 | 77 | -0.40 |
| Goal Setting | 2 | 225 | 113 | -0.02 | 0.08 | -0.03 | -0.05 | 0.18 | 100 | -0.05 |
| Industry Knowledge | 4 | 913 | 228 | -0.03* | 0.03 | -0.04* | -0.05* | 0.05 | 100 | -0.05 |
| Influence | 7 | 551 | 79 | 0.02 | 0.17 | 0.01 | 0.02 | 0.34 | 47 | -0.39 |
| Information Analysis | 3 | 344 | 115 | 0.08* | 0.06 | 0.09* | 0.14* | 0.13 | 100 | 0.14 |
| Initiative | 6 | 1469 | 245 | -0.08* | 0.07 | -0.11* | -0.17* | 0.16 | 74 | -0.30 |
| Innovation | 8 | 1514 | 189 | -0.03 | 0.08 | -0.04 | -0.06 | 0.17 | 81 | -0.18 |
| Interpersonal Skills | 4 | 233 | 58 | -0.13* | 0.13 | -0.17* | -0.25* | 0.23 | 100 | -0.25 |
| Intrapersonal Skills | 2 | 839 | 420 | -0.05* | 0.02 | -0.07* | -0.10* | 0.03 | 100 | -0.10 |
| Leadership | 19 | 2437 | 128 | -0.07* | 0.08 | -0.10* | -0.15* | 0.16 | 100 | -0.15 |
| Managing Change | 4 | 355 | 89 | -0.11 | 0.13 | -0.14 | -0.22 | 0.33 | 44 | -0.62 |
| Managing Performance | 6 | 209 | 35 | -0.14* | 0.12 | -0.19* | -0.29* | 0.23 | 100 | -0.29 |
| Motivating Others | 5 | 473 | 95 | -0.05 | 0.07 | -0.07 | -0.11 | 0.17 | 100 | -0.11 |
| Negotiation | 5 | 581 | 116 | 0.00 | 0.11 | 0.00 | 0.00 | 0.21 | 89 | -0.12 |
| Oral Communication | 11 | 1248 | 113 | -0.03 | 0.10 | -0.05 | -0.07 | 0.19 | 100 | -0.07 |
| Organizational Commitment | 2 | 42 | 21 | -0.06 | 0.09 | -0.07 | -0.11 | 0.18 | 100 | -0.11 |
| Planning/Organizing | 7 | 782 | 112 | -0.02 | 0.11 | -0.03 | -0.04 | 0.20 | 97 | -0.10 |
| Problem Solving | 5 | 465 | 93 | 0.03 | 0.11 | 0.03 | 0.05 | 0.22 | 100 | 0.05 |
| Professionalism | 4 | 1283 | 321 | -0.05* | 0.04 | -0.07* | -0.11* | 0.08 | 100 | -0.11 |
| Quality Orientation | 7 | 456 | 65 | -0.05 | 0.09 | -0.08 | -0.12 | 0.19 | 100 | -0.12 |
| Resource Management | 3 | 378 | 126 | 0.04 | 0.05 | 0.05 | 0.08 | 0.09 | 100 | 0.08 |
| Risk Management | 4 | 128 | 32 | -0.18* | 0.09 | -0.24* | -0.36* | 0.15 | 100 | -0.36 |
| Safety | 5 | 345 | 69 | 0.06 | 0.08 | 0.07 | 0.11 | 0.22 | 100 | 0.11 |
| Sales Ability | 3 | 178 | 59 | 0.08 | 0.16 | 0.11 | 0.08 | 0.16 | 67 | -0.07 |
| Self Development | 8 | 761 | 95 | 0.01 | 0.08 | 0.00 | 0.00 | 0.15 | 100 | 0.00 |
| Service Orientation | 12 | 1511 | 126 | -0.04 | 0.08 | -0.05 | -0.08 | 0.17 | 100 | -0.08 |
| Strategic Planning | 10 | 1161 | 116 | -0.01 | 0.08 | -0.01 | -0.02 | 0.17 | 100 | -0.02 |
| Stress Tolerance | 10 | 1096 | 110 | -0.05 | 0.09 | -0.07 | -0.11 | 0.20 | 100 | -0.11 |
| Talent Management | 4 | 287 | 72 | -0.03 | 0.14 | -0.05 | -0.07 | 0.28 | 77 | -0.29 |
| Teamwork | 9 | 1939 | 215 | -0.03* | 0.04 | -0.04* | -0.06* | 0.08 | 100 | -0.06 |
| Trustworthiness | 17 | 1414 | 83 | -0.05* | 0.08 | -0.07* | -0.10* | 0.16 | 100 | -0.10 |
| Valuing Diversity | 7 | 491 | 70 | 0.03 | 0.14 | 0.05 | 0.08 | 0.31 | 66 | -0.22 |
| Work Attitude | 10 | 857 | 86 | -0.08* | 0.12 | -0.10* | -0.15* | 0.23 | 95 | -0.24 |
| Work Ethic | 2 | 350 | 175 | 0.06 | 0.00 | 0.07 | 0.10 | 0.00 | 100 | 0.10 |
| Work Skills | 6 | 529 | 88 | 0.02 | 0.15 | 0.04 | 0.05 | 0.32 | 40 | -0.33 |
| Imaginative | | | | | | | | | | |
| Achievement Orientation | 16 | 1194 | 75 | -0.02 | 0.13 | -0.03 | -0.04 | 0.25 | 69 | -0.27 |
| Active Listening | 3 | 349 | 116 | 0.01 | 0.17 | 0.01 | 0.01 | 0.31 | 27 | -0.42 |
| Building Relationships | 7 | 656 | 94 | 0.01 | 0.05 | 0.01 | 0.02 | 0.09 | 100 | 0.02 |
| Building Teams | 5 | 261 | 52 | -0.10 | 0.14 | -0.13 | -0.17 | 0.27 | 84 | -0.34 |
| Business Acumen | 7 | 668 | 95 | -0.04 | 0.10 | -0.05 | -0.07 | 0.18 | 98 | -0.11 |
| Caring | 2 | 249 | 125 | 0.02 | 0.14 | 0.03 | 0.03 | 0.25 | 40 | -0.28 |
| Citizenship | 6 | 218 | 36 | -0.08 | 0.12 | -0.10 | -0.13 | 0.21 | 100 | -0.13 |
| Decision Making | 15 | 1484 | 99 | -0.07* | 0.10 | -0.10* | -0.13* | 0.20 | 80 | -0.28 |
| Delegation | 2 | 398 | 199 | -0.05 | 0.12 | -0.08 | -0.11 | 0.21 | 35 | -0.39 |
| Dependability | 8 | 788 | 99 | -0.16* | 0.10 | -0.21* | -0.27* | 0.20 | 80 | -0.41 |
| Detail Orientation | 4 | 369 | 92 | -0.10 | 0.11 | -0.11 | -0.14 | 0.20 | 86 | -0.27 |
| Employee Development | 8 | 1000 | 125 | 0.02 | 0.07 | 0.03 | 0.04 | 0.14 | 100 | 0.04 |
| Financial Acumen | 3 | 196 | 65 | -0.14 | 0.16 | -0.20 | -0.26 | 0.31 | 49 | -0.63 |
| Flexibility | 8 | 754 | 94 | -0.08* | 0.09 | -0.11* | -0.14* | 0.18 | 100 | -0.14 |
| Goal Setting | 2 | 225 | 113 | -0.09 | 0.14 | -0.13 | -0.17 | 0.27 | 38 | -0.52 |
| Industry Knowledge | 4 | 913 | 228 | 0.07* | 0.06 | 0.09* | 0.12* | 0.11 | 100 | 0.12 |
| Influence | 7 | 551 | 79 | -0.08* | 0.11 | -0.13* | -0.16* | 0.22 | 83 | -0.30 |
| Information Analysis | 3 | 344 | 115 | -0.04 | 0.08 | -0.05 | -0.07 | 0.15 | 100 | -0.07 |
| Initiative | 6 | 1469 | 245 | -0.02 | 0.08 | -0.03 | -0.04 | 0.15 | 59 | -0.19 |
| Innovation | 8 | 1514 | 189 | 0.01 | 0.04 | 0.01 | 0.01 | 0.08 | 100 | 0.01 |

## Appendix C: Complete Meta-Analysis Results for HDS Scales Aligned with Competency Domains and Criteria (Continued)

| **Business Domain** | K | N | Avg N | r obs | $SD_r$ | $\rho_v$ | ρ | $SD_\rho$ | %VE | 90% CV |
|---|---|---|---|---|---|---|---|---|---|---|
| Imaginative (Continued) | | | | | | | | | | |
| Interpersonal Skills | 4 | 233 | 58 | -0.08 | 0.13 | -0.10 | -0.13 | 0.22 | 100 | -0.13 |
| Intrapersonal Skills | 2 | 839 | 420 | -0.05* | 0.02 | -0.07* | -0.09* | 0.05 | 100 | -0.09 |
| Leadership | 19 | 2437 | 128 | -0.07* | 0.08 | -0.11* | -0.13* | 0.15 | 100 | -0.13 |
| Managing Change | 4 | 355 | 89 | 0.01 | 0.10 | 0.01 | 0.02 | 0.20 | 89 | -0.09 |
| Managing Performance | 6 | 209 | 35 | 0.03 | 0.19 | 0.05 | 0.07 | 0.37 | 64 | -0.29 |
| Motivating Others | 5 | 473 | 95 | 0.00 | 0.12 | 0.00 | 0.00 | 0.23 | 66 | -0.22 |
| Negotiation | 5 | 581 | 116 | -0.03 | 0.13 | -0.04 | -0.05 | 0.22 | 58 | -0.28 |
| Oral Communication | 11 | 1248 | 113 | -0.06 | 0.11 | -0.08 | -0.10 | 0.21 | 65 | -0.30 |
| Organizational Commitment | 2 | 42 | 21 | 0.09 | 0.07 | 0.13 | 0.17 | 0.14 | 100 | 0.17 |
| Planning/Organizing | 7 | 782 | 112 | -0.06 | 0.10 | -0.08 | -0.10 | 0.18 | 84 | -0.22 |
| Problem Solving | 5 | 465 | 93 | -0.07 | 0.09 | -0.10 | -0.13 | 0.17 | 100 | -0.13 |
| Professionalism | 4 | 1283 | 321 | -0.06 | 0.09 | -0.09 | -0.11 | 0.17 | 34 | -0.34 |
| Quality Orientation | 7 | 456 | 65 | -0.04 | 0.06 | -0.06 | -0.07 | 0.13 | 100 | -0.07 |
| Resource Management | 3 | 378 | 126 | 0.06 | 0.06 | 0.08 | 0.10 | 0.11 | 100 | 0.10 |
| Risk Management | 4 | 128 | 32 | 0.10 | 0.14 | 0.15 | 0.20 | 0.27 | 100 | 0.20 |
| Safety | 5 | 345 | 69 | -0.08 | 0.16 | -0.10 | -0.13 | 0.29 | 52 | -0.45 |
| Sales Ability | 3 | 178 | 59 | -0.01 | 0.09 | -0.01 | -0.01 | 0.16 | 100 | -0.01 |
| Self Development | 8 | 761 | 95 | -0.08* | 0.10 | -0.10* | -0.13* | 0.19 | 96 | -0.19 |
| Service Orientation | 12 | 1511 | 126 | 0.02 | 0.09 | 0.02 | 0.03 | 0.16 | 93 | -0.04 |
| Strategic Planning | 10 | 1161 | 116 | -0.02 | 0.07 | -0.02 | -0.03 | 0.13 | 100 | -0.03 |
| Stress Tolerance | 10 | 1096 | 110 | -0.11* | 0.10 | -0.15* | -0.19* | 0.18 | 85 | -0.31 |
| Talent Management | 4 | 287 | 72 | -0.08* | 0.06 | -0.12* | -0.15* | 0.11 | 100 | -0.15 |
| Teamwork | 9 | 1939 | 215 | -0.06* | 0.08 | -0.08* | -0.10* | 0.16 | 60 | -0.27 |
| Trustworthiness | 17 | 1414 | 83 | -0.09* | 0.12 | -0.13* | -0.17* | 0.22 | 80 | -0.32 |
| Valuing Diversity | 7 | 491 | 70 | -0.05 | 0.10 | -0.07 | -0.09 | 0.20 | 100 | -0.09 |
| Work Attitude | 10 | 857 | 86 | -0.04 | 0.15 | -0.07 | -0.08 | 0.27 | 49 | -0.40 |
| Work Ethic | 2 | 350 | 175 | -0.07 | 0.06 | -0.09 | -0.12 | 0.10 | 100 | -0.12 |
| Work Skills | 6 | 529 | 88 | -0.04 | 0.13 | -0.04 | -0.06 | 0.23 | 67 | -0.28 |
| **Leadership Domain** | | | | | | | | | | |
| Cautious | | | | | | | | | | |
| Achievement Orientation | 16 | 1194 | 75 | -0.02* | 0.09 | -0.04* | -0.04* | 0.15 | 100 | -0.04 |
| Active Listening | 3 | 349 | 116 | -0.07 | 0.11 | -0.08 | -0.10 | 0.18 | 71 | -0.26 |
| Building Relationships | 7 | 656 | 94 | -0.05 | 0.14 | -0.05 | -0.06 | 0.23 | 57 | -0.31 |
| Building Teams | 5 | 261 | 52 | -0.09 | 0.13 | -0.12 | -0.15 | 0.23 | 100 | -0.15 |
| Business Acumen | 7 | 668 | 95 | 0.05 | 0.08 | 0.07 | 0.08 | 0.13 | 100 | 0.08 |
| Caring | 2 | 249 | 125 | -0.08 | 0.07 | -0.09 | -0.11 | 0.09 | 100 | -0.11 |
| Citizenship | 6 | 218 | 36 | -0.15* | 0.11 | -0.20* | -0.24* | 0.17 | 100 | -0.24 |
| Decision Making | 15 | 1484 | 99 | -0.02 | 0.12 | -0.04 | -0.04 | 0.23 | 56 | -0.29 |
| Delegation | 2 | 398 | 199 | -0.16* | 0.11 | -0.28* | -0.34* | 0.24 | 23 | -0.69 |
| Dependability | 8 | 788 | 99 | -0.07* | 0.08 | -0.12* | -0.14* | 0.16 | 100 | -0.14 |
| Detail Orientation | 4 | 369 | 92 | 0.02 | 0.07 | 0.03 | 0.04 | 0.11 | 100 | 0.04 |
| Employee Development | 8 | 1000 | 125 | -0.01 | 0.10 | -0.01 | -0.02 | 0.17 | 75 | -0.16 |
| Financial Acumen | 3 | 196 | 65 | -0.01 | 0.08 | -0.01 | -0.01 | 0.13 | 100 | -0.01 |
| Flexibility | 8 | 754 | 94 | -0.12* | 0.14 | -0.20* | -0.24* | 0.28 | 37 | -0.60 |
| Goal Setting | 2 | 225 | 113 | 0.06 | 0.21 | 0.08 | 0.10 | 0.37 | 18 | -0.45 |
| Industry Knowledge | 4 | 913 | 228 | -0.04 | 0.05 | -0.05 | -0.06 | 0.08 | 100 | -0.06 |
| Influence | 7 | 551 | 79 | -0.04 | 0.09 | -0.05 | -0.06 | 0.15 | 100 | -0.06 |
| Information Analysis | 3 | 344 | 115 | 0.06 | 0.06 | 0.07 | 0.09 | 0.11 | 100 | 0.09 |
| Initiative | 6 | 1469 | 245 | -0.07 | 0.13 | -0.11 | -0.14 | 0.26 | 17 | -0.53 |
| Innovation | 8 | 1514 | 189 | -0.03 | 0.07 | -0.05 | -0.06 | 0.12 | 99 | -0.08 |
| Interpersonal Skills | 4 | 233 | 58 | -0.12* | 0.12 | -0.17* | -0.20* | 0.21 | 100 | -0.20 |
| Intrapersonal Skills | 2 | 839 | 420 | 0.04 | 0.03 | 0.04 | 0.05 | 0.05 | 100 | 0.05 |
| Leadership | 19 | 2437 | 128 | -0.05* | 0.09 | -0.07* | -0.09* | 0.18 | 69 | -0.25 |
| Managing Change | 4 | 355 | 89 | -0.08* | 0.04 | -0.10* | -0.13* | 0.06 | 100 | -0.13 |
| Managing Performance | 6 | 209 | 35 | -0.06 | 0.09 | -0.08 | -0.10 | 0.16 | 100 | -0.10 |
| Motivating Others | 5 | 473 | 95 | -0.13* | 0.12 | -0.18* | -0.22* | 0.21 | 61 | -0.44 |
| Negotiation | 5 | 581 | 116 | -0.11* | 0.10 | -0.14* | -0.17* | 0.13 | 100 | -0.17 |
| Oral Communication | 11 | 1248 | 113 | -0.07* | 0.11 | -0.12* | -0.14* | 0.21 | 55 | -0.38 |
| Organizational Commitment | 2 | 42 | 21 | 0.02 | 0.01 | 0.04 | 0.05 | 0.02 | 100 | 0.05 |

## Appendix C: Complete Meta-Analysis Results for HDS Scales Aligned with Competency Domains and Criteria (Continued)

| Leadership Domain | K | N | Avg N | r obs | $SD_r$ | $\rho_v$ | ρ | $SD_\rho$ | %VE | 90% CV |
|---|---|---|---|---|---|---|---|---|---|---|
| Cautious (Continued) | | | | | | | | | | |
| Planning/Organizing | 7 | 782 | 112 | -0.01 | 0.09 | -0.02 | -0.02 | 0.16 | 98 | -0.06 |
| Problem Solving | 5 | 465 | 93 | -0.03 | 0.07 | -0.03 | -0.03 | 0.13 | 100 | -0.03 |
| Professionalism | 4 | 1283 | 321 | -0.04 | 0.05 | -0.05 | -0.06 | 0.09 | 100 | -0.06 |
| Quality Orientation | 7 | 456 | 65 | -0.04 | 0.12 | -0.05 | -0.07 | 0.20 | 100 | -0.07 |
| Resource Management | 3 | 378 | 126 | 0.05 | 0.07 | 0.06 | 0.08 | 0.11 | 100 | 0.08 |
| Risk Management | 4 | 128 | 32 | -0.05 | 0.11 | -0.08 | -0.09 | 0.19 | 100 | -0.09 |
| Safety | 5 | 345 | 69 | 0.06 | 0.13 | 0.07 | 0.09 | 0.21 | 92 | -0.02 |
| Sales Ability | 3 | 178 | 59 | -0.08 | 0.10 | -0.12 | -0.15 | 0.19 | 100 | -0.15 |
| Self Development | 8 | 761 | 95 | -0.01 | 0.09 | -0.01 | -0.02 | 0.15 | 100 | -0.02 |
| Service Orientation | 12 | 1511 | 126 | -0.01 | 0.07 | -0.02 | -0.03 | 0.12 | 100 | -0.03 |
| Strategic Planning | 10 | 1161 | 116 | -0.03 | 0.07 | -0.05 | -0.06 | 0.13 | 100 | -0.06 |
| Stress Tolerance | 10 | 1096 | 110 | -0.06 | 0.16 | -0.10 | -0.12 | 0.29 | 30 | -0.52 |
| Talent Management | 4 | 287 | 72 | 0.06 | 0.12 | 0.08 | 0.10 | 0.20 | 98 | 0.05 |
| Teamwork | 9 | 1939 | 215 | 0.03 | 0.09 | 0.03 | 0.04 | 0.14 | 65 | -0.10 |
| Trustworthiness | 17 | 1414 | 83 | 0.01 | 0.10 | 0.01 | 0.02 | 0.19 | 94 | -0.06 |
| Valuing Diversity | 7 | 491 | 70 | 0.01 | 0.10 | 0.01 | 0.01 | 0.16 | 100 | 0.01 |
| Work Attitude | 10 | 857 | 86 | -0.11* | 0.08 | -0.15* | -0.18* | 0.14 | 100 | -0.18 |
| Work Ethic | 2 | 350 | 175 | 0.05* | 0.01 | 0.06* | 0.07* | 0.02 | 100 | 0.07 |
| Work Skills | 6 | 529 | 88 | -0.02 | 0.14 | -0.02 | -0.03 | 0.24 | 54 | -0.29 |
| Bold | | | | | | | | | | |
| Achievement Orientation | 16 | 1194 | 75 | 0.01 | 0.09 | 0.01 | 0.02 | 0.16 | 100 | 0.02 |
| Active Listening | 3 | 348 | 116 | 0.06 | 0.14 | 0.08 | 0.10 | 0.25 | 40 | -0.22 |
| Building Relationships | 7 | 656 | 94 | 0.03 | 0.10 | 0.04 | 0.05 | 0.17 | 100 | 0.05 |
| Building Teams | 5 | 261 | 52 | -0.05 | 0.16 | -0.08 | -0.10 | 0.30 | 59 | -0.42 |
| Business Acumen | 7 | 668 | 95 | 0.03 | 0.09 | 0.04 | 0.05 | 0.15 | 100 | 0.05 |
| Caring | 2 | 248 | 124 | -0.02 | 0.12 | -0.04 | -0.05 | 0.29 | 25 | -0.47 |
| Citizenship | 6 | 218 | 36 | -0.07 | 0.18 | -0.10 | -0.12 | 0.30 | 71 | -0.34 |
| Decision Making | 15 | 1483 | 99 | -0.02 | 0.09 | -0.03 | -0.03 | 0.16 | 100 | -0.03 |
| Delegation | 2 | 398 | 199 | -0.01 | 0.04 | -0.01 | -0.01 | 0.07 | 100 | -0.01 |
| Dependability | 8 | 788 | 99 | -0.08* | 0.11 | -0.11* | -0.14* | 0.20 | 75 | -0.30 |
| Detail Orientation | 4 | 369 | 92 | -0.02 | 0.09 | -0.03 | -0.04 | 0.14 | 100 | -0.04 |
| Employee Development | 8 | 1000 | 125 | 0.03 | 0.10 | 0.03 | 0.04 | 0.16 | 94 | -0.02 |
| Financial Acumen | 3 | 196 | 65 | -0.15* | 0.08 | -0.21* | -0.26* | 0.14 | 100 | -0.26 |
| Flexibility | 8 | 754 | 94 | 0.01 | 0.09 | 0.01 | 0.01 | 0.15 | 100 | 0.01 |
| Goal Setting | 2 | 225 | 113 | -0.07 | 0.08 | -0.10 | -0.13 | 0.15 | 100 | -0.13 |
| Industry Knowledge | 4 | 913 | 228 | 0.05 | 0.06 | 0.07 | 0.09 | 0.10 | 100 | 0.09 |
| Influence | 7 | 550 | 79 | 0.07 | 0.09 | 0.10 | 0.12 | 0.15 | 100 | 0.12 |
| Information Analysis | 3 | 343 | 114 | 0.02 | 0.05 | 0.03 | 0.03 | 0.09 | 100 | 0.03 |
| Initiative | 6 | 1469 | 245 | 0.06* | 0.06 | 0.08* | 0.10* | 0.10 | 100 | 0.10 |
| Innovation | 8 | 1513 | 189 | 0.05* | 0.03 | 0.07* | 0.09* | 0.06 | 100 | 0.09 |
| Interpersonal Skills | 4 | 233 | 58 | -0.01 | 0.04 | -0.01 | -0.02 | 0.07 | 100 | -0.02 |
| Intrapersonal Skills | 2 | 839 | 420 | 0.01 | 0.03 | 0.01 | 0.01 | 0.06 | 100 | 0.01 |
| Leadership | 19 | 2437 | 128 | 0.00 | 0.11 | 0.00 | -0.01 | 0.19 | 62 | -0.20 |
| Managing Change | 4 | 355 | 89 | 0.07 | 0.13 | 0.09 | 0.11 | 0.23 | 61 | -0.12 |
| Managing Performance | 6 | 209 | 35 | -0.03 | 0.12 | -0.04 | -0.05 | 0.23 | 100 | -0.05 |
| Motivating Others | 5 | 473 | 95 | 0.11* | 0.07 | 0.16* | 0.20* | 0.12 | 100 | 0.20 |
| Negotiation | 5 | 580 | 116 | 0.09* | 0.05 | 0.13* | 0.15* | 0.11 | 100 | 0.15 |
| Oral Communication | 11 | 1248 | 113 | 0.03 | 0.09 | 0.05 | 0.06 | 0.17 | 89 | -0.03 |
| Organizational Commitment | 2 | 42 | 21 | -0.11 | 0.41 | -0.18 | -0.21 | 0.77 | 19 | -1.00 |
| Planning/Organizing | 7 | 781 | 112 | 0.00 | 0.09 | 0.00 | 0.00 | 0.16 | 100 | 0.00 |
| Problem Solving | 5 | 464 | 93 | 0.02 | 0.09 | 0.02 | 0.03 | 0.17 | 100 | 0.03 |
| Professionalism | 4 | 1283 | 321 | 0.05 | 0.06 | 0.06 | 0.08 | 0.10 | 94 | 0.04 |
| Quality Orientation | 7 | 456 | 65 | 0.00 | 0.11 | 0.00 | 0.00 | 0.18 | 100 | 0.00 |
| Resource Management | 3 | 378 | 126 | 0.08 | 0.09 | 0.10 | 0.12 | 0.14 | 100 | 0.12 |
| Risk Management | 4 | 128 | 32 | 0.09* | 0.07 | 0.12* | 0.15* | 0.10 | 100 | 0.15 |
| Safety | 5 | 345 | 69 | 0.04 | 0.16 | 0.07 | 0.09 | 0.27 | 53 | -0.22 |
| Sales Ability | 3 | 178 | 59 | 0.01 | 0.04 | 0.02 | 0.02 | 0.06 | 100 | 0.02 |
| Self Development | 8 | 760 | 95 | 0.02 | 0.10 | 0.03 | 0.03 | 0.17 | 100 | 0.03 |
| Service Orientation | 12 | 1511 | 126 | 0.01 | 0.08 | 0.03 | 0.03 | 0.13 | 100 | 0.03 |

## Appendix C: Complete Meta-Analysis Results for HDS Scales Aligned with Competency Domains and Criteria (Continued)

| **Leadership Domain** | K | N | Avg N | r obs | $SD_r$ | $\rho_v$ | ρ | $SD_\rho$ | %VE | 90% CV |
|---|---|---|---|---|---|---|---|---|---|---|
| Bold (Continued) | | | | | | | | | | |
| Strategic Planning | 10 | 1160 | 116 | 0.06* | 0.07 | 0.08* | 0.09* | 0.13 | 100 | 0.09 |
| Stress Tolerance | 10 | 1095 | 110 | -0.03 | 0.14 | -0.04 | -0.05 | 0.23 | 50 | -0.32 |
| Talent Management | 4 | 287 | 72 | 0.01 | 0.12 | 0.01 | 0.01 | 0.19 | 100 | 0.01 |
| Teamwork | 9 | 1939 | 215 | 0.00 | 0.07 | 0.00 | 0.00 | 0.12 | 88 | -0.07 |
| Trustworthiness | 1 7 | 1413 | 83 | -0.08* | 0.14 | -0.11* | -0.14* | 0.23 | 59 | -0.37 |
| Valuing Diversity | 7 | 491 | 70 | -0.05 | 0.13 | -0.06 | -0.08 | 0.21 | 89 | -0.20 |
| Work Attitude | 10 | 857 | 86 | 0.01 | 0.10 | 0.01 | 0.02 | 0.16 | 100 | 0.02 |
| Work Ethic | 2 | 349 | 175 | 0.04 | 0.03 | 0.05 | 0.06 | 0.05 | 100 | 0.06 |
| Work Skills | 6 | 529 | 88 | 0.05 | 0.10 | 0.07 | 0.09 | 0.20 | 85 | -0.04 |

Note. * Correlation is significant at $\rho < .05$; K = Number of studies; N = Total number of participants across K studies; Avg N = Average number of participants within each study; r obs = Mean observed validity; $SD_r$ = SD of observed correlations; $\rho_v$ = Operational validity corrected for range restriction and criterion unreliability; ρ = True validity at scale level corrected for predictor unreliability ; $SD_\rho$ = SD of true validity; %VE = Percentage of variance explained; 90% CV = Credibility value.

## APPENDIX D: NORMS FOR THE TOTAL SAMPLE (N = 109,103)

| Raw Score | HDS Scales | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | EXC Norms | SKE Norms | CAU Norms | RES Norms | LEI Norms | BOL Norms | MIS Norms | COL Norms | IMA Norms | DIL Norms | DUT Norms |
| 0 | 13 | 3 | 15 | 1 | 1 | 0 | 1 | 0 | 1 | 0 | 0 |
| 1 | 33 | 10 | 35 | 6 | 5 | 1 | 4 | 1 | 5 | 0 | 0 |
| 2 | 53 | 24 | 55 | 24 | 15 | 3 | 11 | 4 | 13 | 0 | 0 |
| 3 | 69 | 41 | 69 | 46 | 32 | 7 | 22 | 9 | 25 | 1 | 2 |
| 4 | 81 | 58 | 80 | 65 | 54 | 13 | 35 | 16 | 40 | 2 | 5 |
| 5 | 88 | 72 | 87 | 78 | 72 | 22 | 50 | 27 | 55 | 4 | 11 |
| 6 | 93 | 83 | 92 | 88 | 85 | 34 | 64 | 39 | 69 | 8 | 22 |
| 7 | 96 | 90 | 95 | 94 | 93 | 47 | 76 | 53 | 80 | 14 | 37 |
| 8 | 98 | 95 | 97 | 97 | 97 | 61 | 86 | 67 | 89 | 24 | 55 |
| 9 | 99 | 97 | 99 | 99 | 99 | 75 | 93 | 78 | 95 | 39 | 72 |
| 10 | 99 | 99 | 99 | 100 | 100 | 86 | 97 | 87 | 98 | 59 | 87 |
| 11 | 100 | 100 | 100 | 100 | 100 | 93 | 99 | 93 | 99 | 80 | 96 |
| 12 | 100 | 100 | 100 | 100 | 100 | 98 | 100 | 97 | 100 | 93 | 99 |
| 13 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 99 | 100 | 99 | 100 |
| 14 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |

Note. EXC – Excitable; SKE – Skeptical; CAU – Cautious; RES – Reserved; LEI – Leisurely; BOL – Bold; MIS – Mischievous; COL – Colorful; IMA – Imaginative; DIL – Diligent; DUT – Dutiful.

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