

The Agile Leader

Technical Manual



GLOBAL CENTER FOR DIGITAL
BUSINESS TRANSFORMATION
An IMD and Cisco Initiative



SUMMARY

This report summarizes the competency research conducted for the International Institute for Management Development (IMD) Agile Leader Model. IMD, via Metaberatung, collaborated with Hogan to validate the Hogan Personality Inventory ([HPI](#)), Hogan Development Survey ([HDS](#)), and Motives, Values, Preferences Inventory ([MVPI](#)), to predict an individual's potential to perform the competency-based requirements associated with Agile Leader performance successfully.

The report details the methods used to (a) identify the accumulation of validity evidence and (b) provide rationale for the HPI, HDS, and MVPI scale selection for each Agile Leader competency.

Hogan researchers conducted a review to identify key Agile Leader competencies, and aligned those competencies to the Hogan Competency Model ([HCM](#)). Next, employing a synthetic/job component validation process, we searched the Hogan archive to locate criterion measures evaluating the Agile Leader competencies. This process (a) identified valid predictors of those job components based on the results of archival validation studies using the assessments, (b) aggregated correlations across multiple studies for each component/competency, and (c) applied the results to the same components/competencies required for Agile Leaders. Hogan then used these results and content validity/expert judgment to develop the final scale recommendations used to predict each Agile Leader competency.

Hogan leveraged the final scale recommendations to create competency-based algorithms scoring using assessment scores for each Agile Leader competency. Hogan recommends organizations use the competency-driven scoring as an additional piece of information when identifying successful Agile Leaders.

The remainder of this document describes (a) the research process, (b) the recommended scoring guidelines, and (c) the estimated impact of using the assessments to develop Agile Leaders.

We organized this document in the following sections:

- ***Introduction*** – project overview
- ***Competency Identification*** – establishing critical competencies
- ***Synthetic/Job Component Validity*** – research on jobs with similar components
- ***Scale Selection*** – description of recommended scales
- ***Recommendations*** – application and implementation

For more detailed information about the processes detailed in the following pages, please consult the Hogan Competency Research Methodology ([HCRM](#)) addendum. The addendum contains more information regarding all research steps.

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1 INTRODUCTION

1.1 Problem and Setting

A review of alternative development techniques prompted IMD to conclude that an assessment of personality characteristics could enhance the current procedures used to develop Agile Leaders. IMD, via Metaberatung, contacted Hogan and initiated research to construct a measurement platform for Agile Leader competencies. By aligning the Agile Leader competency model to the Hogan Competency Model (HCM), Hogan can leverage the Hogan Personality Inventory (R. Hogan & J. Hogan, 2007; hereafter “HPI”), the Hogan Development Survey (R. Hogan & J. Hogan, 2009; hereafter “HDS”), and the Motives, Values, Preferences Inventory (J. Hogan & R. Hogan, 2010; hereafter “MVPI”) to create custom scale recommendations. For more information on the development of the HCM and how Hogan uses personality to predict performance based on competencies, please refer to HCRM chapter [A1](#). If the inventory scales demonstrated validity, IMD planned to use the assessments to help develop Agile Leaders at various organizations.

Our research conforms to standards outlined in the Uniform Guidelines on Employee Selection Procedures (Equal Employment Opportunity Commission, 1978; hereafter “Uniform Guidelines”), The Principles for the Validation and Use of Personnel Selection Procedures (Society for Industrial and Organizational Psychology, 2003; hereafter “Principles”), and the Standards for Educational and Psychological Testing (American Educational Research Association, 2014; hereafter “Standards”). In areas where the Uniform Guidelines, Principles and/or Standards proved vague or inapplicable, the research approach relies on the broader scientific/professional literature for guidance.

1.2 User, Location(s), and Dates of Study

IMD is a top-ranked business school whose goal is to develop successful global leaders, individuals, teams, and organizations (IMD, 2017). Hogan conducted research described in this report between April 2017 and July 2017. Although most work occurred online or over the phone, participating individuals were located:

Hogan Assessment Systems	IMD	Metaberatung
11 S. Greenwood	Ch. De Bellerive 23	Pariser Str. 100
Tulsa, OK 74120	P.O. Box 915 CH-1001	40549 Dusseldorf, Germany
	Lausanne, Switzerland	

For additional information regarding (a) the foundation, (b) rationale behind the steps described in this report, or (c) assessments used in this study, please consult the [HCRM](#).

2 COMPETENCY IDENTIFICATION

2.1 Job Analysis Survey

The *Uniform Guidelines* emphasizes the importance of conducting a complete job analysis for all content and construct validation studies. The guidelines require documentation of (a) work behaviors and/or outcomes, (b) the criticality of work behaviors or outcomes, and (c) the supporting evidence and rationale for grouping together two or more jobs (section 15, B, 3). This section describes the collaborative steps taken by Hogan and IMD to comply with these technical guidelines. For more information on Hogan's approach to Job Analysis, please consult the HCRM Job Analysis chapter [A2.2.1](#).

Hogan collected data from the Subject Matter Expert (SME) panel via the Job Evaluation Tool (JET). The four JET sections uncover personality-, motivational-, and competency-based requirements of jobs and include:

- The *Performance Improvement Characteristics* (PIC) aligns with the HPI and asks experts to identify characteristics critical for successful job performance.
- The *Derailment Characteristics Questionnaire* (DCQ) aligns with the HDS and asks experts to identify characteristics that impede or degrade job performance.
- The *Motivational Improvement Characteristics* (MIC) aligns with the MVPI and asks experts to rate the extent to which each characteristic describes the work group.
- The *Competency Evaluation Tool* (CET) uncovers the critical competencies related to successful performance.

The following sections provide the results from this survey. For more detailed JET item descriptions, refer to Tables [A4](#), [A6](#), [A8](#) and [A10](#) in the HCRM.

2.1.1 PIC Results

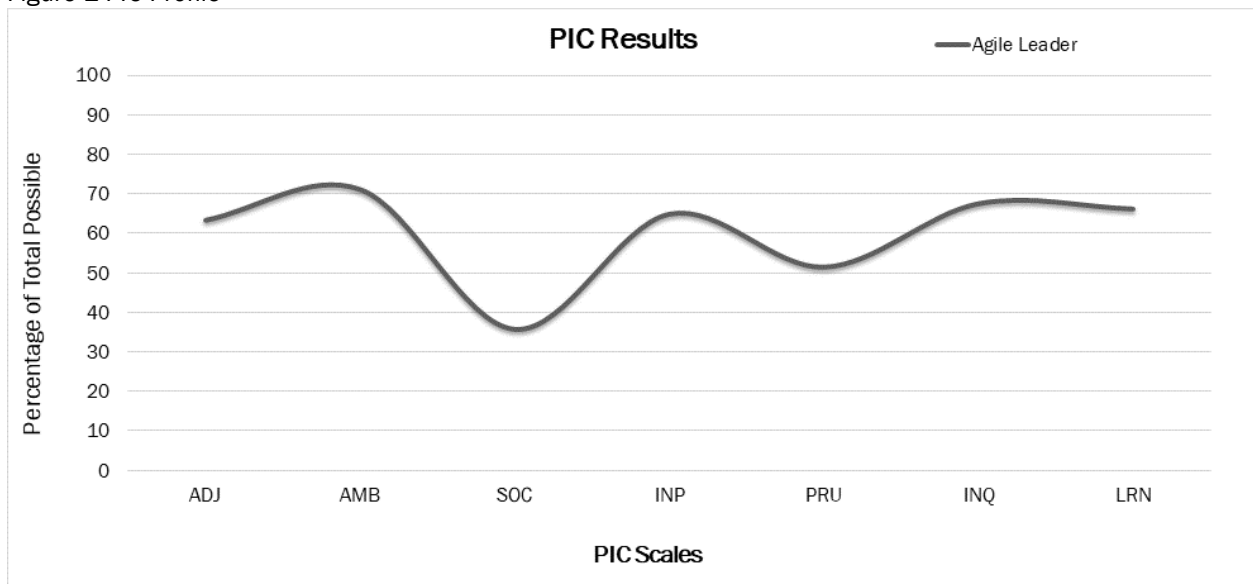
SMEs ($N = 12$) with knowledge of the Agile Leader job completed the PIC. Hogan conducted inter-rater reliability analyses to determine rater agreement. Including all raters yielded an inter-rater reliability coefficient of .89, indicating a strong degree of agreement among raters. Hogan averaged PIC scores across SMEs and converted to percentage of total possible. The number of items on each scale varies according to the number of personality facets associated with that scale. As a result, the total possible score on each scale ranges from 15 (Learning Approach) to 27 (Adjustment). Table 1 presents raw score results for each scale. Figure 1 presents scores converted to a percentage of total possible. For more detailed PIC information, please consult HCRM section [A2.2.1a](#).

Table 1 Raw Score PIC Means and Standard Deviations

PIC Scale	Definition - <i>The degree to which a person seems...</i>	Total Possible	M	SD
Adjustment	Calm and self-accepting	27	17.08	3.34
Ambition	Self-confident and competitive	21	14.92	3.29
Sociability	To need or enjoy social interaction	18	6.42	3.70
Interpersonal Sensitivity	Perceptive, tactful, and sensitive	18	11.67	2.42
Prudence	Conscientious and conforming	24	12.33	3.20
Inquisitive	Creative and interested in problems	21	14.17	3.81
Learning Approach	Concerned with building job related knowledge	15	9.92	3.29

Note. N = 12. M = Mean; SD = Standard Deviation

Figure 1 PIC Profile



PIC results indicated higher-performance in the Agile Leader role is associated with energetic and goal oriented (Ambition), perceptive and tactful (Interpersonal Sensitivity), interested in problem solving (Inquisitive), and concerned with building job related knowledge (Learning Approach). Ambition received the highest ratings.

2.1.2 DCQ Results

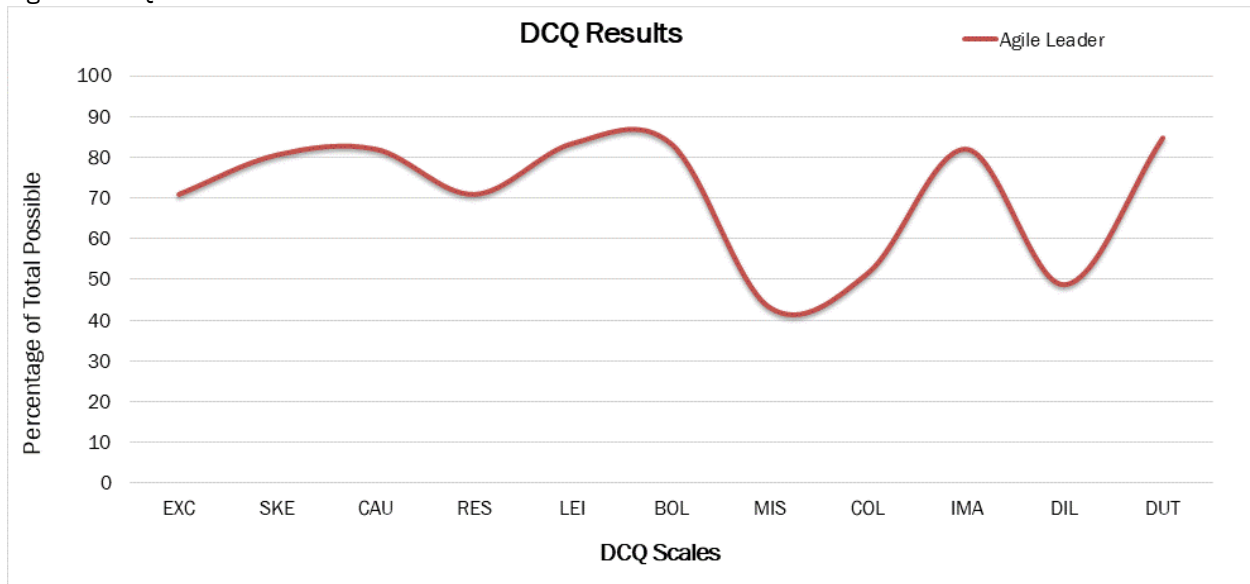
SMEs ($N = 12$) rated the 22 DCQ items. Each scale consists of two items resulting in a total possible raw score of six for each dimension. Including all raters in subsequent reliability analyses yielded an inter-rater reliability coefficient of .81, indicating a good degree of agreement among raters. Table 2 presents raw score results for each scale. Figure 2 presents scores converted to a percentage of total possible. The DCQ instructions ask SMEs to rate personal characteristics based on the extent to which they *impair* job performance. Thus, characteristics with higher ratings are likely to detract from or inhibit effective Agile Leader performance. For more detailed DCQ information, please consult HCRM section [A2.2.1b](#).

Table 2 Raw Score DCQ Means and Standard Deviations

DCQ Scale	Definition - <i>The degree to which a person seems...</i>	M	SD
Excitable	Moody and hard to please	4.25	1.91
Skeptical	Cynical, mistrustful, and doubtful of others' true intentions	4.83	1.80
Cautious	Reluctant to take risks due to fear of failure or criticism	4.92	1.73
Reserved	Aloof, detached, and not interested in the feelings of others	4.25	2.01
Leisurely	Independent and resistant to feedback	5.00	1.76
Bold	Unusually self-confident and reluctant to admit shortcomings	5.00	1.71
Mischievous	Impulsive, manipulative, and exploitive	2.58	1.88
Colorful	Expressive, dramatic, and attention-seeking	3.08	1.98
Imaginative	Creative yet eccentric and impractical	4.92	1.78
Diligent	Meticulous, perfectionistic, and overly critical	2.92	2.11
Dutiful	Eager to please and reliant on others for guidance	5.08	1.78

Note. $N = 12$. M = Mean; SD = Standard Deviation

Figure 2 DCQ Profile



DCQ results suggest that lower performance is associated suspicious of others' true intentions (Skeptical), reluctant to try new methods (Cautious), stubborn and unwilling to confront others (Leisurely), arrogant and resistant to feedback (Bold), distractible and unconventional (Imaginative), and reluctant to take independent action (Dutiful). This is an interpretable pattern based on the constructs assessed by the HDS and is consistent with the duties of Agile Leaders.

2.1.3 MIC Results

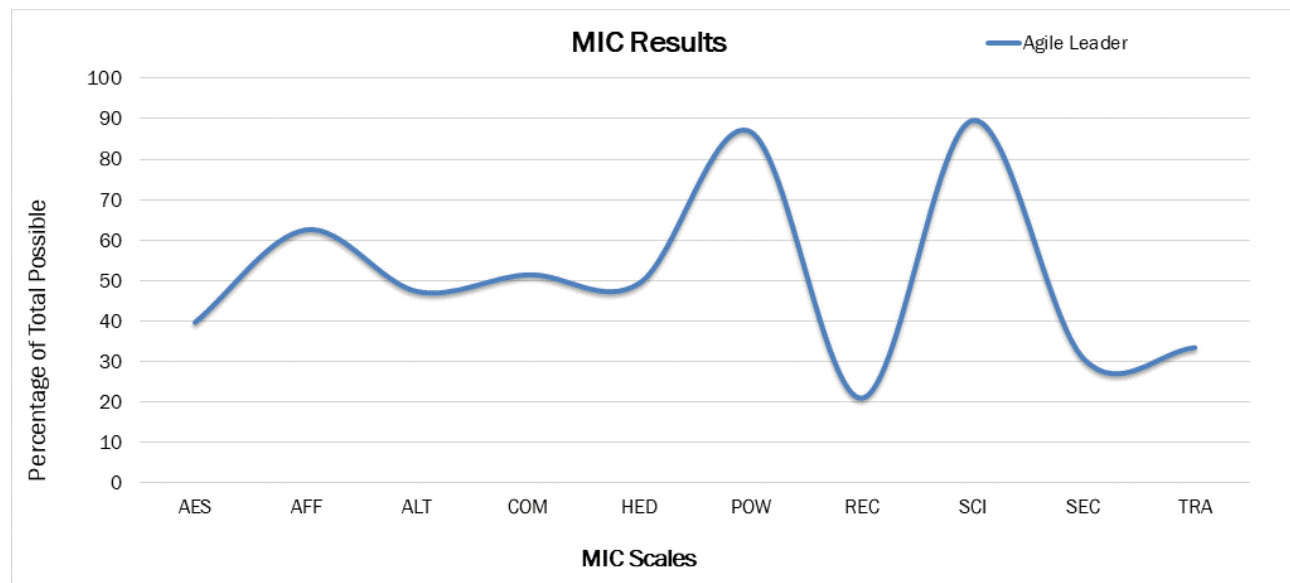
SMEs ($N = 12$) rated the 40 MIC items, comprising 10 scales, each with a total possible raw score of 12. Including all raters in subsequent reliability analyses yielded an inter-rater reliability coefficient of .93, indicating a strong degree of agreement among raters. Table 3 presents raw score results for each scale. Figure 3 presents scores converted to a percentage of total possible. The resulting percentile scores illustrate the characteristics the SME panel judged important for Agile Leaders. For more detailed MIC information, please consult HCRM section [A2.2.1c](#).

Table 3 Raw Score MIC Means and Standard Deviations

MIC Scale	Definition - <i>The degree to which a person values...</i>	M	SD
Aesthetics	Work quality and artistic endeavors	4.75	2.63
Affiliation	Friendship and social interaction	7.50	2.39
Altruistic	Helping and caring for others	5.67	2.23
Commerce	Business and financial matters	6.17	2.76
Hedonism	Fun and having a good time	5.92	3.42
Power	Accomplishment and competition	10.42	2.11
Recognition	Praise and recognition	2.50	3.32
Science	The pursuit of knowledge	10.75	1.29
Security	Certainty and predictability in life	3.67	2.19
Tradition	History and old-fashioned virtues	4.00	2.37

Note. N = 12. M = Mean; SD = Standard Deviation

Figure 3 MIC Profile



The highest MIC ratings indicated that higher performance is associated with the following MVPI scales: Power and Science. This pattern of scores suggests an environment characterized by valuing achievement and influence (Power) and data-driven decision-making (Science). Conversely, SMEs rated characteristics associated with public acknowledgment (Recognition) as being the least relevant to Agile Leader performance.

2.1.4 CET Results

SMEs (N = 12) rated the 62 CET competencies. Including all raters in subsequent reliability analyses yielded an inter-rater reliability coefficient of .75, indicating a good degree of agreement among raters. The CET asks SMEs to indicate the degree to which each of the 62

listed competencies are related to successful performance in Agile Leaders. For more detailed CET information, please consult HCRM section [A2.2.1d](#).

A full list of CET definitions is located in HCRM table [A10](#). CET results based on SME ratings appear in Table 4. As seen in this table, the competencies rated as most critical (one standard deviation above the mean) include Driving Change, Dealing with Ambiguity, Driving Strategy, Listening to Others, Overcoming Obstacles, Attracting Talent, Setting Goals, Business Insight, and Driving Innovation.

Definitions for these competencies are found in Table 5. These competencies outline personal characteristics and professional competencies required for successful Agile Leader performance.

Table 4 Raw Score CET Means and Standard Deviations

Competency	M	SD	Competency	M	SD
Driving Change	3.67	0.49	Anticipating Problems	3.00	0.74
Dealing with Ambiguity	3.42	0.67	Processing Information	3.00	0.95
Driving Strategy	3.42	0.79	Displaying Confidence	2.92	0.67
Listening to Others	3.42	0.67	Driving Performance	2.92	0.90
Overcoming Obstacles	3.33	0.99	Handling Stress	2.92	0.67
Attracting Talent	3.33	0.78	Developing People	2.92	0.67
Setting Goals	3.33	0.89	Engagement	2.92	1.00
Business Insight	3.33	0.89	Planning and Organizing	2.75	0.87
Driving Innovation	3.33	0.89	Leveraging People Skills	2.75	0.62
Flexibility	3.25	0.97	Influencing Others	2.75	0.87
Driving for Results	3.25	0.75	Quality Focus	2.75	0.75
Team Building	3.25	0.75	Leading Others	2.67	0.49
Political Savvy	3.25	0.87	Self Development	2.67	0.78
Delegating	3.17	0.84	Managing Resources	2.58	1.00
Industry Insight	3.17	0.84	Caring about People	2.58	0.52
Positive Attitude	3.17	0.58	Working Hard	2.50	0.91
Taking Initiative	3.17	0.84	Dependability	2.50	0.52
Decision Making	3.17	0.94	Negotiating	2.50	0.67
Teamwork	3.17	0.84	Managing Conflict	2.50	0.80
Solving Problems	3.17	0.84	Financial Insight	2.50	0.80
Presenting to Others	3.17	0.72	Professionalism	2.42	0.67
Taking Smart Risks	3.08	0.90	Leveraging Diversity	2.42	1.08
Inspiring Others	3.08	0.79	Written Communication	2.42	0.79
Relationship Building	3.08	0.90	Sales Focus	2.33	1.23
Accountability	3.08	0.67	Time Management	2.25	0.87
Customer Focus	3.08	1.24	Organizational Citizenship	2.25	0.97
Verbal Communication	3.08	0.52	Staying Alert	2.25	1.36
Self Management	3.00	0.60	Detail Focus	2.08	0.79
Integrity	3.00	0.74	Competing with Others	1.67	1.07
Networking	3.00	0.95	Safety Focus	1.67	0.99
Leveraging Work Skills	3.00	0.85	Rule Compliance	1.58	1.00

Note. N = 12. M = Mean; SD = Standard Deviation.

Table 5 Critical CET Definitions

CET Dimension	Definition
Driving Change	Champions new methods, systems, and processes to improve performance.
Dealing with Ambiguity	Comfortably handles unclear or unpredictable situations.
Driving Strategy	Directs effort to achieve long-term business objectives.
Listening to Others	Listens and restates the ideas and opinions of others to improve mutual understanding.
Overcoming Obstacles	Pursues goals and strategies despite discouragement or opposition.
Attracting Talent	Recruits, rewards, and retains individuals with needed skills and abilities.
Setting Goals	Identifies short-term objectives and steps to achieve them.
Business Insight	Applies business knowledge to achieve organizational goals and objectives.
Driving Innovation	Stimulates creative ideas and perspectives that add value.

2.1.5 Agile Leader Competency Results

To evaluate the Agile Leader competencies, Hogan created a custom section of the JET. The custom Agile Leader section asks SMEs to indicate the degree to which each of the 7 listed Agile Leader competencies is related to successful performance in the job or job family under study. The items for the custom Agile Leader section are in Table 6. Raters are asked to evaluate each competency using a five-point scale ranging from 0 (*Not associated with Agile Leadership*) to 4 (*Critical for Agile Leadership*). Generally, competencies considered critical are those that receive mean ratings greater than 3, where the scale anchor is labeled “*Important to performance.*”

Table 6 Agile Leader Items

1	Engagement: Spends more time asking questions and listening than speaking.
2	Visionary: Prioritizes long-term vision or short-term planning.
3	Adaptability: Changes mindset and reverses course when situations change.
4	Humility: Acknowledges personal limitations.
5	Hyperaware: Scans the environment for opportunities and threats.
6	Making Informed Decisions: Uses data and analytics to support decision making.
7	Executing at Speed: Values speed over perfection.

SMEs ($N = 12$) rated the 7 Agile Leader competencies. Including all raters in subsequent reliability analyses yielded an inter-rater reliability coefficient of .80, indicating a good degree of agreement among raters. The survey asks SMEs to indicate the degree to which each of the 7 listed competencies are related to successful performance in Agile Leaders. Results based on SME ratings appear in Table 7. As seen in this table, the competencies rated as most critical (3.0 or above out of a 4.0 scale) include Visionary, Making Informed Decisions, Hyperaware, Adaptability, Executing at Speed, and Engagement. Definitions for these competencies are found in Table 8. These competencies outline personal characteristics and professional competencies required for successful Agile Leader performance. Although Humility was not rated as critical compared to the other competencies in the model, research

still supports the importance of these behaviors for performance, particularly for engaging followers (Liborius, 2014; Sousa & van Dierendonck, 2017; Walters & Diab, 2016).

Table 7 Raw Score Agile Leader Competency Means and Standard Deviations

Competency	M	SD	Competency	M	SD
Visionary	3.92	0.29	Executing at Speed	3.33	0.65
Making Informed Decisions	3.58	0.67	Engagement	3.17	0.39
Hyperaware	3.50	0.67	Humility	2.67	0.89
Adaptability	3.42	0.67			

Note. *N* = 12. *M* = Mean; *SD* = Standard Deviation.

Table 8 Critical Agile Leader Competencies Definitions

Agile Leader Dimension	Definition
Visionary	Having a clear sense of long-term direction
Making Informed Decisions	Making use of data and information to make evidence-based decisions where possible
Hyperaware	Constantly scanning internal and external environments for opportunities and threats
Adaptability	Accepting that in disrupted business environments change is constant and that changing one's mind based on new information is a strength rather than a weakness
Executing at Speed	Moving quickly to implement, often valuing speed over perfection
Engagement	Having a willingness to listen, interact, and communicate with internal and external stakeholders

As an additional step, Hogan compared the CET results to the Agile Leader results. Table 9 below shows the competencies contained in the HCM versus the Agile Leader model. This further provides evidence for the scope of the Agile Leader model.

Table 9 Alignment Between Agile Leader Competencies and Critical HCM Competencies

Appear in Competency Alignment	Competencies from CET Ratings
✓	Driving Change
✓	Dealing with Ambiguity
✓	Driving Strategy
✓	Listening to Others
✓	Overcoming Obstacles
✓	Attracting Talent
✓	Setting Goals
✓	Business Insight
✓	Driving Innovation

2.1.6 Job Analysis Summary

Job analysis evidence indicates that attributes assessed by the HPI, HDS and MVPI are important for Agile Leader performance.

- PIC results emphasized the importance of characteristics associated with being competitive and goal-oriented (high HPI Ambition), perceptive and tactful (high HPI Interpersonal Sensitivity), interested in solving problems (high HPI Inquisitive), and concerned with building job-related knowledge (high HPI Learning Approach).
- DCQ results emphasized the importance of *not* being suspicious of others' true intentions (high HDS Skeptical), reluctant to try new methods (high HDS Cautious), stubborn and resistant to authority (high HDS Leisurely), arrogant and resistant to feedback (high HDS Bold), distractible and unconventional (high HDS Imaginative), and reluctant to take independent action (high HDS Dutiful).
- MIC results helped define the ideal environment in which Agile Leaders work. Research indicated successful Agile Leaders value environments where achievement and influence (high MVPI Power) and data-driven decision-making (high MVPI Science) are emphasized and encouraged.
- CET results supported the importance of the Driving Change, Dealing with Ambiguity, Driving Strategy, Listening to Others, Overcoming Obstacles, Attracting Talent, Setting Goals, Business Insight, and Driving Innovation competencies.
- Agile Leader Competency results supported the importance of the Visionary, Making Informed Decisions, and Hyperaware competencies. However, Adaptability, Executing at Speed, and Engagement were also rated as relatively important for performance. Although Humility was not rated as critical compared to the other competencies in the model, research still supports the importance of these behaviors for performance (Liborius, 2014; Sousa & van Dierendonck, 2017; Walters & Diab, 2016).

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

2.2 Competency Alignment

As part of the development of competency-based guidelines, Hogan aligned IMD's Agile Leader competencies with the HCM (Hogan Assessment Systems, 2016). To align the two competency models, clear competency definitions were necessary. For this project, we relied on information provided by IMD to define each competency and illustrate the types of work styles and behaviors associated with each component. The Hogan Research Division (HRD) then used their expert knowledge of competencies and job performance to align the IMD competencies with Hogan competencies. For more information on this process, see HCRM section [A2.3](#). Table 10 displays the alignment of the Hogan and Agile Leader competency models.

Table 10 IMD and Hogan Competency Alignment

IMD Competency	IMD Competency Definition	Hogan Competency	Hogan Competency Definition
Humility	Being able to accept feedback and recognizing that others may know more than you do	Self Management	Demonstrates appropriate motivation, attitude, and self-control.
		Professionalism	Acts in accordance with job-related values, principles, and standards.
		Flexibility	Changes direction as appropriate based on new ideas, approaches, and strategies.
Adaptability	Accepting that in disrupted business environments change is constant and that changing one's mind based on new information is a strength rather than a weakness	Driving Change	Champions new methods, systems, and processes to improve performance.
		Dealing with Ambiguity	Comfortably handles unclear or unpredictable situations.
		Overcoming Obstacles	Pursues goals and strategies despite discouragement or opposition.
		Setting Goals	Identifies short-term objectives and steps to achieve them.
Visionary	Having a clear sense of long-term direction	Driving Strategy	Directs effort to achieve long-term business objectives.
		Driving Innovation	Stimulates creative ideas and perspectives that add value.
Engagement	Having a willingness to listen, interact, and communicate with internal and external stakeholders	Listening to Others	Listens and restates the ideas and opinions of others to improve mutual understanding.
		Relationship Building	Develops collaborative relationships to facilitate current and future objectives.

Table 10 IMD and Hogan Competency Alignment (continued)

IMD Competency	IMD Competency Definition	Hogan Competency	Hogan Competency Definition
Engagement (continued)	Having a willingness to listen, interact, and communicate with internal and external stakeholders	Networking	Builds and maintains a system of strategic business connections.
		Political Savvy	Recognizes, interprets, and works within the political environment of an organization.
		Attracting Talent	Recruits, rewards, and retains individuals with needed skills and abilities.
Hyperaware	Constantly scanning internal and external environments for opportunities and threats	Anticipating Problems	Forecasts and detects errors, gaps, and potential flaws.
		Overcoming Obstacles	Pursues goals and strategies despite discouragement or opposition.
Making Informed Decision	Making use of data and information to make evidence-based decisions where possible	Business Insight	Applies business knowledge to achieve organizational goals and objectives.
		Decision Making	Uses sound judgment to make timely and effective decisions.
Executing at Speed	Moving quickly to implement, often valuing speed over perfection	Processing Information	Gathers, organizes, and analyzes diverse sources of information.
		Driving for Results	Accomplishes goals, completes tasks, and achieves results.
		Taking Smart Risks	Evaluates tradeoffs between potential costs and benefits and acts accordingly.

3 SYNTHETIC/JOB COMPONENT VALIDITY

The following section presents synthetic/job component validity from the assessments. The Hogan archive contains information from over 1,000 research studies conducted from 1981 to the present and provides a means to identify the best predictor(s) of each competency in the HCM. Lemming, Nei, & Foster (2016) mapped each of the criteria from over 375 criterion-related validity studies in the Hogan archive onto the Hogan competencies and conducted a meta-analysis for each Hogan scale-by-competency relationship. These meta-analyses provide stable estimates of the relationships between the Hogan scales and the critical competencies for Agile Leaders as defined by IMD. For more information on Hogan’s approach, please consult the HCRM section [A3](#).

3.1 Validity of the HPI for Predicting Job Performance

Table 11 contains a sample of the operational validities (corrected for sampling error, unreliability in the criterion measure, and range restriction; see HCRM [A3.1](#) for more information) of the relationships between the seven HPI scales and one of the critical competencies for Agile Leaders as defined by IMD. Consistent with previous research, the HPI Adjustment, Ambition, Interpersonal Sensitivity, and Prudence (FFM Emotional Stability, Extraversion [in part], Agreeableness, and Conscientiousness) scales best predict performance for the sample IMD competency.

Table 11 HPI Correlations with a Sample Critical Competency

Competency	K	N	ADJ	AMB	SOC	INP	PRU	INQ	LRN
Humility	16	1,850	.13*	.17*	.10	.08	.07	.05	.07
	52	6,559	.19*	.15*	-.02	.13*	.13*	-.02	.01

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

The synthetic evidence shows several general trends in identifying which HPI scales are the best predictors of the most important competencies associated Agile Leaders. Across the 7 Agile Leader competencies, Adjustment, Ambition, and Prudence have the most significant relationships. Conversely, Sociability and Inquisitive have the fewest significant relationships.

3.2 Validity of the HDS for Predicting Job Performance

Table 12 provides a sample of the operational validities (corrected for sampling error, unreliability in the criterion measure, and range restriction; see HCRM [A3.1](#) for more information) of the relationships between the 11 HDS scales and one of the Agile Leader competencies.

Table 12 HDS Correlations with a Sample Critical Competency

Competency	K	N	EXC	SKE	CAU	RES	LEI	BOL	MIS	COL	IMA	DIL	DUT
Humility	8	1,137	-.24*	-.13*	-.09	-.06	-.06	.02	-.06	.05	-.11	.08	.01
	15	2,334	-.16*	-.08*	-.04	-.03	-.05	-.04	-.04	-.03	-.11*	.09*	.03

Note. Results presented in the table are operational validities; * = 95% confidence interval did not contain 0; K = number of studies; N = number of participants across K studies; EXC = Excitable; SKE = Skeptical; CAU = Cautious; RES = Reserved; LEI = Leisurely; BOL = Bold; MIS = Mischievous; COL = Colorful; IMA = Imaginative; DIL = Diligent; DUT = Dutiful/

Across the 7 Agile Leader competencies, Excitable, Skeptical, and Leisurely have the most significant relationships. Cautious, Imaginative, and Dutiful also have a moderate number of significant relationships. Conversely, Reserved, Bold, Mischievous, and Diligent have the fewest significant relationships.

3.3 Validity of the MVPI for Predicting Job Performance

Note that synthetic validation evidence for the MVPI is unavailable because the MVPI is not a generalizable predictor of job performance, as workplace culture and motivators are not consistent across companies or even specific job families. HRD used their expert judgment to align MVPI scales with the Agile Leader competencies. In addition, we used evidence from the job analysis results. Specifically, the MIC ratings indicated that higher performance is associated with the following MVPI scales: Power and Science. Therefore, we included both scales in the final scale selection discussed in the next section.

4 SCALE SELECTION

Hogan integrated both empirical and qualitative evidence to develop scale selections for each competency. As part of this study's content validation process, the Hogan team members referenced the following qualitative information sources: (a) the Agile Leader competency model, (b) the HPI, HDS, and MVPI technical manuals (R. Hogan & J. Hogan, 2007; R. Hogan & J. Hogan, 2009; J. Hogan & R. Hogan, 2010), (c) *The Hogan Guide: Interpretation and Use of the Hogan Inventories* (R. Hogan, J. Hogan, & Warrenfeltz, 2007), and (d) past profiles created for similar competencies. Quantitative results were derived from the results of the job analysis and from synthetic validity.

The following example provides an illustration of how we used empirical and content validity evidence together to create the most predictive competency profiles. For the "Engagement" competency, the synthetic validity evidence provided empirical support for several HPI and HDS scales. Out of these empirically linked scales, Hogan selected the HPI Interpersonal Sensitivity and Sociability scales and the HDS Reserved scales to include in the profile based on synthetic and content validity. Specifically, those with higher scores on Interpersonal Sensitivity tend to be good communicators, who can tailor their style to accommodate a wide variety of individuals. Individuals with high scores on Sociability tend to be gregarious and enjoy interacting with others. High scorers on Reserved tend to be uncommunicative and aloof. Thus, behaviors associated with higher Interpersonal Sensitivity and Sociability scores and lower Reserved scores predicted the behavioral descriptors of the "Engagement" competency. Lastly, although we cannot draw on synthetic validity, we included the MVPI Affiliation and Altruism scale based on IMD's and Hogan's expert judgement, job analysis results, and its content validity. For example, individuals who score higher on Affiliation value working with others and high scorers on Altruism are concerned with the welfare of others. Therefore, we used our expert judgment to create scoring identifying individuals scoring higher on Affiliation and Altruism who will demonstrate behaviors associated with the "Engagement" competency.

After developing scale selections using both quantitative and qualitative evidence, the Hogan and IMD teams discussed and reviewed each competency scale selection until all members agreed on the final solution. An overview of the scales selected for each competency is provided in the following sections.

4.1 Scale Selection Overview

After identifying the qualitatively- and quantitatively-linked scales, we examined the scales across each Agile Leader competency to ensure there were no redundancies. In addition, this step safeguards against one scale dominating the model. We also reviewed the job analysis data to ensure scale representation matches the results. As seen in Table 13, each Agile Leader competency is associated with between 4 and 6 Hogan scales.

Table 13 Overview of Selected Hogan Scales

Scale	Agile Leader Competencies						
	1	2	3	4	5	6	7
HPI Adjustment							
HPI Ambition		▲	▲		▲		▲
HPI Sociability				▲			
HPI Interpersonal Sensitivity	▲			▲			
HPI Prudence		▼					▼
HPI Inquisitive		▲	▲			▲	
HPI Learning Approach					▲	▲	
HDS Excitable		▼					
HDS Skeptical					▲		
HDS Cautious		▼					▼
HDS Reserved				▼			
HDS Leisurely							
HDS Bold	▼						
HDS Mischievous							
HDS Colorful			▲				
HDS Imaginative			▲				
HDS Diligent					▲	▲	
HDS Dutiful	▲						▼
MVPI Aesthetic							
MVPI Affiliation				▲			
MVPI Altruism				▲			
MVPI Commerce							
MVPI Hedonism							
MVPI Power			▲		▲		▲
MVPI Recognition	▼						
MVPI Science						▲	▼
MVPI Security		▼			▼		
MVPI Tradition		▼					

Note. 1= Humility, 2= Adaptability, 3= Visionary, 4= Engagement, 5= Hyperaware, 6= Making Informed Decisions, 7= Executing at Speed.

4.2 AGILE LEADER COMPETENCY MODEL MAPPED TO THE HPI, HDS, & MVPI

An extensive review of the results from the prior sections of this report allowed Hogan experts to determine the most appropriate scales to use as a foundation for developing Agile Leaders. Table 14 below presents the selected scales for each Agile Leader competency. For more information on Hogan's scale selection process, please refer to HCRM [A4](#).

Table 14 Agile Leader Competency Model Mapped to the HPI, HDS, & MVPI

COMPETENCY	COMPETENCY DESCRIPTION	HPI	HDS	MVPI
Humility	Being able to accept feedback and recognizing that others may know more than you do	Interpersonal Sensitivity (higher)	Dutiful (higher) Bold (lower)	Recognition (lower)
Adaptability	Accepting that in disrupted business environments change is constant and that changing one's mind based on new information is a strength rather than a weakness	Ambition (higher) Prudence (lower) Inquisitive (higher)	Excitable (lower) Cautious (lower)	Security (lower) Tradition (lower)
Visionary	Having a clear sense of long-term direction	Ambition (higher) Inquisitive (higher)	Imaginative (higher) Colorful (higher)	Power (higher)
Engagement	Having a willingness to listen, interact, and communicate with internal and external stakeholders	Interpersonal Sensitivity (higher) Sociability (higher)	Reserved (lower)	Affiliation (higher) Altruism (higher)
Hyperaware	Constantly scanning internal and external environments for opportunities and threats	Ambition (higher) Learning Approach (higher)	Skeptical (higher) Diligent (higher)	Power (higher) Security (lower)
Making Informed Decision	Making use of data and information to make evidence-based decisions where possible	Inquisitive (higher) Learning Approach (higher)	Diligent (higher)	Science (higher)
Executing at Speed	Moving quickly to implement, often valuing speed over perfection	Ambition (higher) Prudence (lower)	Cautious (lower) Dutiful (lower)	Power (higher) Science (lower)

5 RECOMMENDATIONS

An extensive review of the results from the prior sections of this report allowed Hogan experts to determine the most appropriate scales to use as a foundation for developing Agile Leaders.

Hogan recommends organizations use the competency-based solution outlined in this report to develop Agile Leaders. By administering the HPI, HDS, and MVPI and using the associated competency algorithms and scoring, they should be able to improve their development practices. For more information on the scoring development process, please see HCRM [A5](#).

5.1 Competency Scoring

Hogan uses synthetic/job component validation evidence to identify the most predictive scales for each competency. Using those scales, we then create mathematical algorithms for each competency. Scale-based algorithms use normative percentile scores instead of raw scores, which unit weights the scales included in each algorithm and facilitates interpretation. For more information on the development of competency scoring algorithms, please see HCRM [A5.1.2](#).

5.1.1 Competency Algorithms

Hogan created scores for the Agile Leader competency model by adding positive-oriented and subtracting negative-oriented Hogan scale scores to create a raw competency score. We then convert this raw score to a percentile score based on a sample of working professionals ($N = 229$). Hogan recommends periodically updating competency norms as new data is collected.

Candidate recommendation levels are based on the percentile score. For more information on how HRD creates these percentile scores, please see HCRM [A5.1.2a](#).

5.2 Uses and Applications

Hogan recommends Agile Leader development should be determined, in part, by using the competency-based guidelines outlined in this report. Performance appraisal and/or monitoring data should be maintained, if possible, on Agile Leaders developed based on the guidelines found in HCRM section [A5.3](#). These data provide a check on the validity of scoring recommendations and help determine utility. For further information concerning this research or the results provided, please contact:

Hogan Assessment Systems
11 S. Greenwood
Tulsa, Oklahoma 74120
(918) 749-0632

5.3 Accuracy and Completeness

Hogan completes all procedures within the requirements of both the Uniform Guidelines and the Principles. Hogan derives results strictly from the research processes described above and archived study results and does not embellish, falsify, or alter results in any manner.

Hogan attests to the accuracy of the data collection, analysis, and reporting procedures used in all validity studies. Hogan enters all data collected into a database and computes results using the latest version of SPSS statistical software. In the event of a challenge to the research done by Hogan, organizations will be granted access to technical documentation and data as needed.

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ADDENDUM: Hogan Competency Research Methodology (HCRM)

Addendum Summary

This addendum provides a summary of research procedures used to evaluate the validity of the Hogan Personality Inventory (R. Hogan & J. Hogan, 2007; hereafter “HPI”), the Hogan Development Survey (R. Hogan & J. Hogan, 2009; hereafter “HDS”), and the Motives, Values, Preferences Inventory (J. Hogan & R. Hogan, 2010; hereafter “MVPI”) for predicting job performance. All methods used to (a) identify the job’s key requirements, (b) accumulate validity evidence, and (c) select scales to predict performance are included in this guide and outlined below.

Hogan uses a synthetic validity approach to validate competency research. First, a team of Ph.D. and Masters level psychologists aligns a model with the Hogan Competency Model (HCM). Also, Hogan gathers additional support for the competency model by gathering ratings of importance from Subject Matter Expert (SME). Next Hogan examines evidence from the Hogan archive to select the best scale predictors for each competency. Finally, Hogan uses these scales to create scoring to predict behavior on the competency model.

Our research conforms to standards outlined in the *Uniform Guidelines on Employee Selection Procedures* (Equal Employment Opportunity Commission, 1978; hereafter “*Uniform Guidelines*”), *The Principles for the Validation and Use of Personnel Selection Procedures* (Society for Industrial and Organizational Psychology, 2003; hereafter “*Principles*”), and the *Standards for Educational and Psychological Testing* (American Educational Research Association, 1999; hereafter “*Standards*”). In areas where the Uniform Guidelines, Principles and/or Standards proved vague or inapplicable, the research approach relies on the broader scientific/professional literature for guidance.

A1. WHAT TO MEASURE AND WHY

Global markets require organizations to simultaneously work within different locations, legal environments, and cultures. One strategy for facing this challenge is restructuring jobs, such as reducing management layers and relying on work teams, to increase adaptability and responsiveness (Ashkenas, Ulrich, Jick, & Kerr, 1995; Howard, 1995; Keidel, 1994). As a result of global markets, traditional task-based job analysis procedures may lack the flexibility required to identify the knowledge, skills, and abilities essential for success in many jobs (Barnes-Nelson, 1996; Olian & Rynes, 1991; Sanchez, 1994). Therefore, organizations often use competency models to align many of their Human Resource Management applications.

The work of David McClelland (1973) set the stage for the widespread growth of competencies. McClelland argued that aptitude tests, almost universally used to predict performance, do not serve their intended purpose well and are prone to cultural biases. Also, he argued other traditional measures, such as examination results and references, are equally poor at predicting job success. Instead, McClelland suggested individual competence might provide a more promising alternative for predicting performance. He described competencies as representing groups of behaviors underlying individual characteristics that enable superior job performance.

Competencies appear in educational, training, employment, and assessment contexts, where often a primary goal is identifying individual characteristics that lead to success (Boyatzis, Stubbs, & Taylor, 2002; Rubin et al., 2007; Spencer & Spencer, 1993). Companies can link individual characteristics to competencies that represent critical job components. Then they can use this information to select individuals with these characteristics and guide development and training efforts (Schippmann et al., 2000).

A1.1 The Hogan Competency Model

During the past several years, Hogan witnessed an increase in the number of requests for competency-based reports as more organizations develop and use competency models. To identify relationships between commonly used competencies and personality, we developed the Hogan Competency Model (HCM).

Hogan's Research Division (HRD) designed the HCM to align with other well-known competency models and personality measures. The development of the HCM included five steps. First, we reviewed 56 competency definitions, flagging competencies that measured multiple constructs or overlapped with other competencies. Next, we reviewed 21 academic, commercial, and government competency models and compared them to the 56 competencies. Three HRD researchers independently mapped the original 56 competencies to each comparison model. Based on all available information from the first two steps, we eliminated redundant competencies, clarified definitions, and added frequently occurring and missing competencies. Fourth, we obtained feedback from non-Industrial/Organizational (I/O) professionals on the revised list of competencies. Finally, four HRD researchers again independently mapped the revised competency model to each of the 21 comparison models. The resulting model includes 62 competencies. The following sections further delineate these steps.

A1.1.1 Competency Definitions

We began by examining the competencies and definitions on 56 competencies. First, HRD identified overlapping competencies by examining competency definitions and correlating ratings obtained on a sample of over 500 jobs. Results indicated that several competencies overlapped both conceptually and statistically. For example, Trustworthiness and Integrity overlapped significantly, as did Adaptability and Flexibility. Furthermore, other models often treated these and other pairings as one competency.

Next, we reviewed competency definitions. We flagged competency definitions that (a) included the competency name in the definition, (b) contained multiple concepts, (c) overlapped with other competencies, or (d) were generally unclear. For example, Innovation was defined as “finding innovative solutions...,” and the definition of Planning/Organizing addressed multiple concepts (Resource Management and Time Management), but not aspects of organization typically addressed by similar competencies in other models.

A1.1.2 Competitor and Academic Competency Models

Next, we reviewed 21 independent competency models and compared the 56 competencies to the identified models. These models came from academic, commercial, and government sources. We identified competency models using three strategies. First, we conducted a literature search for publications outlining relevant competency models (e.g. Tett, Guterman, Bleir, & Murphy, 2000). Next, we contacted partner organizations, including clients and distributors, and asked for their competency models. Finally, we contacted companies and competitors with well-advertised or commonly-used models (e.g. SHL, Bartram, 2005). We only reviewed whole models containing complete competency definitions. Our final sample consisted of 6 commercial, 12 academic, and 3 government agency models. See [Appendix A](#) for a list of the models.

A1.1.3 Competency Mapping

Competency mapping consisted of three phases:

Phase 1: I/O Professionals. Three HRD researchers independently mapped the 56 competencies to each competency in the 21 comparison models. Raters indicated if the competencies in the other models mapped directly to a Hogan competency, more than one Hogan competency, or none. In addition, each rater maintained a list of frequently occurring competencies that mapped poorly to Hogan competencies or were not included in the Hogan model. We aggregated the results and the raters met to resolve conflicts and reach a final consensus. Based on these final results and our previous review of competency definitions, we eliminated redundant competencies, clarified definitions, and added missing competencies.

Phase 2: Non I/O Professionals. To better represent individuals who will use the model in the future, we asked four non-I/O professionals to provide feedback on the revised list of competencies. Our goal was to ensure that all competencies were easy for the target population to understand and use. We obtained feedback from non-I/O professionals

with extensive business experience and expertise in different areas (IT, Finance, Sales, and Operations). First, each individual independently mapped each competency into the Domain Model, noting if each competency fell under one primary domain and potentially a secondary domain. Second, they provided recommendations for the content and phrasing of the competency names and definitions. The raters successfully placed 43 of the competencies into the same domain, indicating high rater agreement. Furthermore, no rater noted any problems with the competency model names and definitions, indicating that the model is intuitive and not overly laden with I/O jargon.

Phase 3: Re-mapping by I/O Professionals. Finally, four HRD researchers again independently mapped the revised competency model to each of the 21 comparison models and met to reach a final consensus. The number of competencies that mapped to the comparison models greatly increased from phase 1. However, we found a few definitions that needed further revision and identified four additional competencies for inclusion. For example, because 7 of the 21 comparison models contained Valuing Diversity, we added it to the Hogan model. The resulting competency model includes 62 competencies.

Overall, each Hogan competency averaged seven mappings. We mapped each model to the Hogan model a minimum of three times. This represents over 12,480 individual comparisons of the Hogan model to the comparison models. This finding provides further support for the comprehensiveness of the HCM. [Appendix B](#) presents the resulting HCM from this approach. Table A1 presents a crosswalk between the labels for the 56 and the 62 Hogan Competency Models. In 2015, Hogan updated the competency names and definitions based on client feedback about business language.

Table A1 Crosswalk Between HCM Versions

56 HCM	62 HCM (Original)	62 HCM (Current)
Achievement Orientation (modified definition)	Achievement Orientation	Driving for Results
Verbal Direction (similar to)	Active Listening	Listening to Others
NEW	Ambiguity Tolerance	Dealing with Ambiguity
Build Strategic Work Relationships	Building Relationships	Relationship Building
Building Teams (modified definition)	Building Teams	Team Building
NEW	Business Acumen	Business Insight
NEW	Caring	Caring about People
Citizenship (completely new and different definition)	Citizenship	Organizational Citizenship
NEW	Competitive	Competing with Others
Decision Making/Judgment (modified definition)	Decision Making	Decision Making
Delegation (modified definition)	Delegation	Delegating
Dependability	Dependability	Dependability
Detail Orientation (modified definition)	Detail Orientation	Detail Focus
Employee Development/Training Others (combined and modified definition)	Employee Development	Developing People
NEW	Financial Acumen	Financial Insight
Flexibility/Adaptability (modified definition)	Flexibility	Flexibility
NEW/verbal direction (modified)	Following Procedures	Rule Compliance
NEW	Goal Setting	Setting Goals
Industry Knowledge (modified definition)	Industry Knowledge	Industry Insight
Influence/Gaining Commitment (completely new and different definition)	Influence	Influencing Others
NEW	Information Analysis	Processing Information
Initiative	Initiative	Taking Initiative
Innovation (completely new definition)	Innovation	Driving Innovation
Interpersonal Skills	Interpersonal Skills	Leveraging People Skills
NEW	Intrapersonal Skills	Self Management
Leadership (modified definition)	Leadership	Leading Others
Facilitating Change (completely new and different definition)	Managing Change	Driving Change
Conflict Resolution (modified definition)	Managing Conflict	Managing Conflict
Performance Management/Performance Feedback/Follow-Up (completely new and different definition)	Managing Performance	Driving Performance
Leadership (modified)/NEW	Motivating Others	Inspiring Others
Negotiation	Negotiation	Negotiating
Oral Communication (modified definition)	Oral Communication	Verbal Communication
Organizational Commitment	Organizational Commitment	Engagement
NEW	Perseverance	Overcoming Obstacles
Planning/Organizing (new definition)	Planning/Organizing	Planning and Organizing

Table A1 Crosswalk Between HCM Versions (Continued)

56 HCM	62 HCM (Original)	62 HCM (Current)
Political Awareness (no definition with CET)	Political Awareness	Political Savvy
Formal Presentation (modified definition)	Presentation Skills	Presenting to Others
Problem Solving (modified definition)	Problem Identification	Anticipating Problems
Problem Solving (modified definition)	Problem Solving	Solving Problems
Professionalism (no definition with CET)	Professionalism	Professionalism
Quality Orientation (no definition with CET)	Quality Orientation	Quality Focus
Management Performance (definition modified)	Resource Management	Managing Resources
NEW	Responsibility	Accountability
Risk Taking	Risk Management	Taking Smart Risks
Safety	Safety	Safety Focus
Sales Ability, Facilitative Sales, Consultative Sales (all combined and modified definition)	Sales Ability	Sales Focus
NEW	Self Confidence	Displaying Confidence
Continuous Learning (modified definition)	Self Development	Self Development
Customer Service (modified definition)	Service Orientation	Customer Focus
NEW	Social Engagement	Networking
Strategic Vision (new definition)	Strategic Planning	Driving Strategy
Stress Tolerance	Stress Tolerance	Handling Stress
NEW	Talent Management	Attracting Talent
Teamwork (new definition)	Teamwork	Teamwork
Planning/Organizing (modified name)	Time Management	Time Management
Trustworthiness/Integrity (combined/modified definition)	Trustworthiness	Integrity
NEW	Valuing Diversity	Leveraging Diversity
Vigilance	Vigilance	Staying Alert
Work Attitude	Work Attitude	Positive Attitude
NEW	Work Ethic	Working Hard
Job Knowledge	Work Skills	Leveraging Work Skills
Written Communication	Written Communication	Written Communication

A1.1.4 Domain Model

The Domain Model is used to effectively classify existing competencies into a comprehensive and meaningful performance model (R. Hogan & Warrenfeltz, 2003; Warrenfeltz, 1995), leading to easier interpretations of and comparisons across models. The model contains four domains:

- ***Intrapersonal Skills*** - Intrapersonal skills develop early in childhood and have important consequences for career development in adulthood. Core components include core-self-esteem, resiliency, and self-control. Intrapersonal skills form the foundation on which careers develop.
- ***Interpersonal Skills*** - Interpersonal skills concern building and sustaining relationships. Interpersonal skills can be described in terms of three components: (a) an ability to put oneself in the position of another person, (b) an ability to accurately perceive and anticipate other's expectations, and (c) an ability to incorporate information about the other person's expectations into subsequent behavior.
- ***Technical Skills*** - Technical skills differ from Intrapersonal and Interpersonal skills in that they are (a) the last to develop, (b) the easiest to teach, (c) the most cognitive, and (d) the least dependent upon dealing with other people. Technical skills involve comparing, compiling, innovating, computing, analyzing, coordinating, and synthesizing work activities.
- ***Leadership Skills*** - Leadership skills can be understood in terms of five components that depend upon intrapersonal, interpersonal, and technical skills. First, leadership skills entail an ability to recruit talented people to join the team. Second, leaders must be able to retain talent once it has been recruited. Third, leaders must be able to motivate a team. Fourth, effective leaders are able to develop and promote a vision for the team. Finally, leadership skill involves being persistent and hard to discourage.

R. Hogan and Warrenfeltz (2003) suggest that the four domains form a natural, overlapping developmental sequence, with the latter skills (e.g., Leadership Skills) depending on the appropriate development of the earlier skills (e.g., Intrapersonal Skills). Each of the performance domains can be further decomposed into various performance dimensions or competencies. Table A2 outlines the complete Domain Model, illustrating the links between common competencies associated with each domain and Five Factor Model (FFM) personality measures. Each competency in the HCM falls under one of the four domains.

Table A2 Domain Model of Job Performance, Example Competencies, and Personality Measures

Metaconcept	Domain	Example Competency	FFM Measurement
Getting Ahead	Leadership	Achievement	Surgency/Extraversion
		Building Teams	
		Business Acumen	
		Decision Making	
		Delegation	
		Employee Development	
		Initiative	
	Business	Leadership	Openness to Experience
		Managing Performance	
		Resource Management	
		Analysis	
		Creating Knowledge	
		Decision Making	
		Political Awareness	
Getting Along	Interpersonal	Presentation Skills	Agreeableness Surgency/Extraversion
		Problem Solving	
		Safety	
		Technical Skill	
		Training Performance	
	Interpersonal	Written Communication	Conscientiousness Emotional Stability
		Building Relationships	
		Communication	
		Consultative Skills	
		Cooperating	
Interpersonal	Influence	Conscientiousness Emotional Stability	
	Interpersonal Skill		
	Organizational Citizenship		
	Service Orientation		
	Teamwork		
	Trustworthiness		
	Dependability		
	Detail Orientation		
	Flexibility		
Following Procedures			
Interpersonal	Integrity	Conscientiousness Emotional Stability	
	Planning		
	Respect		
	Risk Taking		
	Stress Tolerance		
	Work Attitude		

A1.2 Personality Measurement and Prediction

The 1980s witnessed a growth in the use of competencies to identify and predict leadership effectiveness and long-term success (Boyatzis, 1982; McClelland & Boyatzis, 1982). These applications led to the development of competency-based selection tools, such as behavioral event interviews (Boyatzis, 1994; McClelland, 1998; Spencer, McClelland, & Spencer, 1994) and high-level management and leadership competency models (Hollenbeck, McCall, & Silzer, 2006) that often include differences between job levels (Rodriguez, Patel, Bright, Gregory, & Gowing, 2002).

Also, competencies provide a structure for linking performance with cognitive ability and personality (Dragoni, Oh, Vankatwyk, & Tesluk, 2011; Heinsman, de Hoogh, Koopman, & van Muijen, 2007), coaching employees to overcome dysfunctional behavior (Boyatzis, 2006), promoting employees (Morgeson, Campion, Levashina, 2009), improving workplace safety (Chang, Chen, & Wu, 2012), and selecting and developing high potential employees (Dragoni et al., 2011; McClelland, 1994). More recently, researchers have focused on identifying best practices for developing and implementing competency models (Campion et al., 2011) as well as suggestions for developing the next generation of competency modeling (Schippmann, 2010). Hogan uses personality to predict performance based on competencies.

A1.2.1 Approach and Rationale

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

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

Assessment instruments should also be "fair," in that they should not discriminate unfairly on the basis of gender, age, or race (Equal Employment Opportunity Commission, 1978). As such, professionals must validate selection procedures that result in adverse impact in accordance with the *Uniform Guidelines*. Unfortunately, many instruments used in applied contexts fail to meet the criteria outlined above (R. Hogan, J. Hogan, & Trickey, 1999).

A1.2.2 Measuring Personality

For personality assessment, the most important question is “*What should we measure?*” Historically, the answer depended on an author’s personal interests (e.g., Locus of Control; Rotter, 1966), practical concerns (e.g., Minnesota Multiphasic Personality Inventory; Hathaway & McKinley, 1943), or theory (e.g., Myers-Briggs Type Indicator; Briggs-Meyers, McCaulley, Quenk, & Hammer, 1998; Thematic Apperception Test; Morgan & Murray, 1935). Multi-dimensional personality inventories developed during the 1940s and 1950s measured traits, or hypothetical structures believed to underlie differences in social behavior (cf. Allport, 1937). Early approaches to personality inventory construction led to more advanced test development strategies and improved the quality and interpretability of the instruments.

Current thinking in personality assessment converges on the idea that most personality characteristics reflect five broad personality dimensions (Hough & Dilchert, 2010). The Five-Factor Model (FFM; cf. Digman, 1990; Goldberg, 1992; John, 1990, p. 72; McCrae & Costa, 1987), which emerged from 50 years of factor analytic research on the structure of observer ratings (cf. Norman, 1963; Thurstone, 1934; Tupes & Christal, 1961), suggests that we think about and describe others and ourselves in terms of five themes (Goldberg, 1990):

- I. ***Surgency/Extraversion*** - The degree to which a person is outgoing and talkative.
- II. ***Agreeableness*** - The degree to which a person is rewarding to deal with and pleasant.
- III. ***Conscientiousness*** - The degree to which a person complies with rules, norms, and standards.
- IV. ***Emotional Stability*** - The degree to which a person appears calm and self-accepting.
- V. ***Intellect/Openness to Experience*** - The degree to which a person seems creative and open-minded.

The FFM provides the starting point for several prominent personality inventories constructed within the last 30 years (e.g., NEO-PI: Costa & McCrae, 1992; HPI: R. Hogan & J. Hogan, 1995, 2007; Personal Characteristics Inventory: Mount & Barrick, 2001; FFMQ: Gill & Hodgkinson, 2007; IPIP: Donnellan, Oswald, Baird, & Lucas, 2006). The five dimensions provide a useful taxonomy for classifying individual differences in social behavior (i.e., reputation). Evidence suggests that all existing multidimensional personality inventories conform, with little difficulty, to these five dimensions (Wiggins & Pincus, 1992). Consequently, the FFM represents the dominant paradigm for current research in personality assessment (De Raad & Perugini, 2002; R. Hogan & J. Hogan, 1995, 2007).

The FFM rests on observer’s descriptions of others. These observations form the basis of one’s reputation, or how people describe coworkers or peers (R. Hogan, 1983, 2005). Reputations grow from social consensus regarding consistencies in a person’s behavior, and develop from behavior during social and occupational interaction. These behaviors consist, at least in part, of actions designed to establish, defend, or enhance that person’s identity, or view of him or herself (cf. Goffman, 1958). Reputations are public, tell us about observable tendencies and behavior, can be measured reliably, and can be used to forecast future behavior (cf. Emler, 1990). Consequently, a person’s reputation represents an invaluable

source of information about work-related strengths and shortcomings and influences the direction of careers.

A1.2.3 Personality as a Predictor of Important Outcomes

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

For example, personality predicts a number of major life outcomes, such as academic achievement, mortality, divorce, subjective well-being, and occupational attainment (Lievens, Ones, & Dilchert, 2009; O'Connor & Paunonen, 2007; Poropat, 2009; Roberts, Kuncel, Shiner, Caspi, & Goldberg, 2007; Rothstein, Paunonen, Rush, & King, 1994; Steel, Schmidt, & Shulz, 2008). Research also demonstrates that personality predicts health-related behaviors including the use of drugs and alcohol (Bogg & Roberts, 2004; Cooper-Hakim & Viswesvaran, 2002; Paunonen, Haddock, Forsterling, & Keinonen, 2003; Roberts, Chernyshenko, Stark, & Goldberg, 2005). Illustrating the value of personality across contexts, Ozer and Benet-Martinez (2006) noted that, at an individual level, personality dispositions relate to happiness, physical and psychological health, spirituality, and identity. At an interpersonal level, the authors also found personality related to the quality of peer, family, and romantic relationships. Finally, at a social/institutional level, personality relates to occupational choice, satisfaction, performance, community involvement, criminal activity, and political ideology.

Additional research illustrates the value of personality for predicting work-related outcomes. For example, researchers consistently find that personality predicts overall job performance (e.g., Barrick, Mount, & Judge, 2001; Dudley, Orvis, Lebiecki, & Cortina, 2006; J. Hogan & Holland, 2003), task performance (Dudley et al., 2006; Hertz & Donovan, 2000), expatriate performance (Mol, Born, Willemsen, & Van Der Molen, 2005) and performance in teams (Peeters, Van Tuijl, Rutte, & Reymen, 2006). Also, personality predicts a range of contextual performance variables including Organizational Citizenship Behaviors (OCBs), altruism, job dedication, interpersonal facilitation, and generalized compliance (Borman, Penner, Allen, & Motowidlo, 2001; Chiaburu, Oh, Berry, Li, & Gardner, 2011; Dudley et al., 2006; Hertz & Donovan, 2000; LePine, Erez, & Johnson, 2002; Organ & Ryan, 1995).

Regarding specific work skills and individual competence, researchers report that personality predicts training performance and skill acquisition (Barrick & Mount, 1991; Barrick et al., 2001; Colquitt, LePine, & Noe, 2000; Major, Turner, & Fletcher, 2006), goal setting (Judge & Ilies, 2002; Steel, 2007), creativity and innovation (Feist, 1998; Furnham, Crump, Batey, Chamorro-Premuzic, 2009; Hough, 1992; Hough & Dilchert, 2007), teamwork (Barrick, Mount, & Gupta, 2003; J. Hogan & Holland, 2003), and job and career satisfaction (Judge, Heller, & Mount, 2002; Ng, Eby, Sorensen, & Feldman, 2005). Among leaders and managers,

personality shows significant correlations with overall managerial effectiveness, promotion, and managerial level (Hough, Ones, & Viswesvaran, 1998; Oh & Berry, 2009), as well as leader emergence and effectiveness (Bono & Judge, 2004; Judge, Bono, Ilies, & Gerhardt, 2002).

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

Considering the applied value of personality in predicting a range of important business-related outcomes, as well as the robustness of these measures against the pitfalls of adverse impact and faking, it is advantageous for organizations to use personality assessment to predict meaningful job performance outcomes. In addition, evaluations of an assessment inventory's predictive effectiveness and operational validity are essential to demonstrate business necessity. As such, Hogan uses rigorous procedures to provide clients with validity evidence for our instruments.

A.1.2.4 Advantages of Using Personality Assessments

In comparison to other methods often employed as a foundation for candidate screening, personality testing offers several advantages. Consider the following:

- Including personality measures within traditional selection batteries is one way to decrease the likelihood of adverse impact against minority groups (Campbell, 1996); using personality measures results in smaller group differences than those found for ability measures (Foldes, Duehr, & Ones, 2008).
- Cognitive ability measures tend to predict technical performance, not interpersonal skills or initiative. These tools also tend to discriminate in terms of gender, age, and race/ethnicity (Hausdorf, LeBlanc, & Chawla, 2003). Further, much of the performance variation is thought to lie in noncognitive factors (i.e. personality), as cognitive ability at the upper levels is narrow (Hollenbeck, 2009).
- There is little empirical support for a link between subjective reviews of resumes and job performance; reviewing a resume does not appear to predict subsequent job performance (O'Leary, 2009).
- Biodata measures tend to be custom-developed tools (Bliesener, 1996), not readily available in an off-the-shelf form, and tend to lack the structure and interpretability necessary to enable professional development.
- Work sample measures and assessment centers, while valid, tend to discriminate in terms of race and ethnicity much more than previously thought (Dean, Roth, & Bobko, 2008; Roth, Bobko, McFarland, & Buster, 2008).

- Integrity tests predict counterproductive work behaviors, yet appear highly related to existing FFM measures and begs the question: “what is left in integrity beyond the Big Five?” (Berry, Sackett, & Wiemann, 2007, p. 278).
- Although face valid and expected as part of the selection process, interviews tend to be subjective and need structure in order to be a strong predictor of job performance (Macan, 2009).
- Empirical research clearly demonstrates that personality assessments are strong incremental predictors of work outcomes; yet personality may also play a role in predicting team performance and organizational culture shifts (Church et al., 2015).

A1.3 Assessments

Hogan offers three personality based assessments – the HPI, HDS, and MVPI. The following sections provide a summary of each measure’s purpose, development, and content. For more information concerning the conceptual background of the assessments, we refer you to their respective manuals (R. Hogan & Hogan, 2007; R. Hogan & Hogan, 2009; R. Hogan & Hogan, 2010).

A1.3.1 The Hogan Personality Inventory

Based on the FFM, development of the HPI began in the late 1970s, with assessment construction and validation conducted in accordance with professional *Standards* and the *Uniform Guidelines*. The HPI was the first measure of normal personality developed explicitly to assess the FFM in occupational contexts. The measurement goal of the HPI is to predict real-world outcomes. As such, it is an original and well-known measure of the FFM and considered a marker instrument.

Initial item generation for the HPI reflected the standard FFM dimensions. However, analyses revealed seven factors, two more than prescribed by the FFM. Analyses suggested that the standard FFM dimension called Surgency has two components that are conceptually unrelated. One component is Sociability, which concerns impulsivity and the need for social interaction – or a lack of shyness. The other component is Ambition, which concerns a desire for status, power, recognition, and achievement. Additionally, we found that the FFM dimension called Intellect/Openness to Experience has two components; one component concerns an interest in culture and ideas, and the other concerns interest in acquiring new knowledge.

The seven scales and related FFM dimensions are as follows:

- **Adjustment:** steady in the face of pressure (FFM: Emotional Stability)
- **Ambition:** appearing leader-like, status-seeking, and achievement-oriented (FFM: Extraversion)
- **Sociability:** needing and/or enjoying social interaction (FFM: Extraversion)
- **Interpersonal Sensitivity:** having social sensitivity, tact, and perceptiveness (FFM: Agreeableness)

- **Prudence:** conforming, dependable, and has self-control (FFM: Conscientiousness)
- **Inquisitive:** imaginative, adventurous, and analytical (FFM: Intellect/Openness)
- **Learning Approach:** enjoying academic activities and valuing education as an end in itself (FFM: Intellect/Openness)

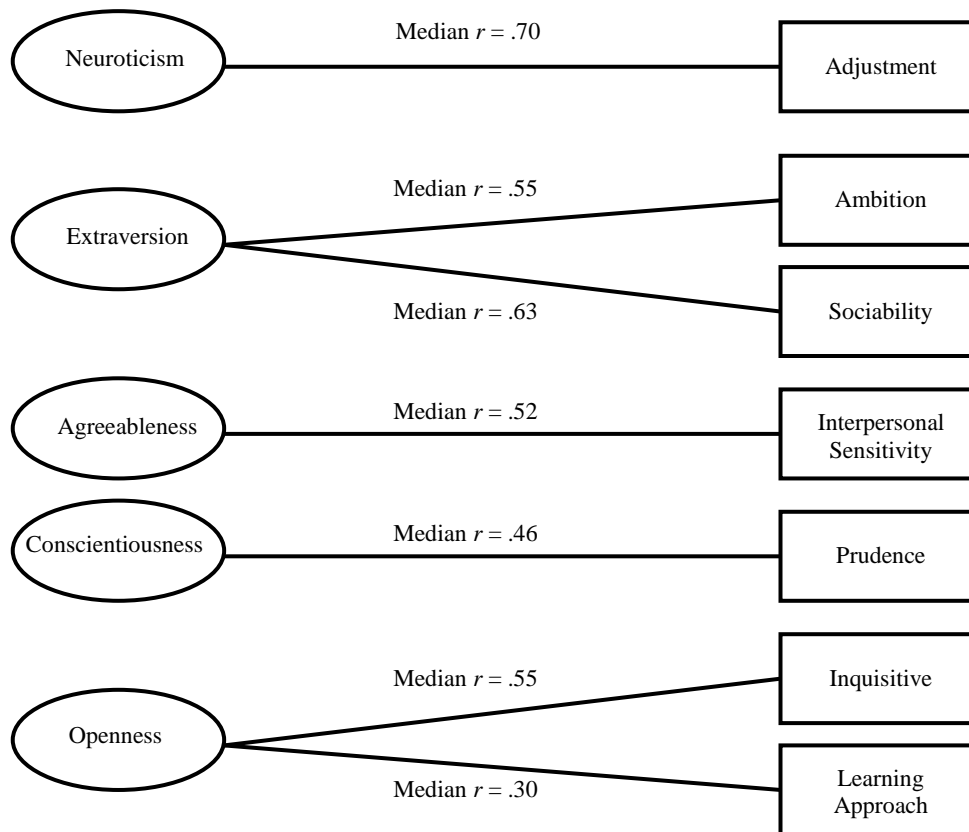
Hogan gathered validation evidence by identifying relationships between the HPI and other well-known measures of FFM. Table A3 presents correlations between the HPI and other assessments of the FFM. Figure A1 shows median correlation coefficients that summarize HPI relations with Goldberg's (1992) Big-Five Markers (R. Hogan & J. Hogan, 2007), the Personal Characteristics Inventory (Mount & Barrick, 1995), the Inventario de Personalidad de Cinco Factores (IP/5F: Salgado & Moscoso, 1999), and the NEO PI-R (Goldberg, 2000).

Table A3 Correlations between HPI Scales and other FFM Assessments

	Hogan Personality Inventory						
	ADJ	AMB	SOC	INP	PRU	INQ	LRN
Extraversion/Surgency							
Goldberg Big Five	.04	.55*	.44*	.31*	-.24*	.29*	-.03
PCI	.04	.39*	.64*	.26*	-.09	.18*	N/A
IP/5F	.24*	.60*	.62*	.35*	.04	.41*	N/A
NEO-PI-R	.16*	.54*	.63*	.44*	-.06	.22*	.08*
Agreeableness							
Goldberg Big Five	.13	-.11	.02	.56*	.23*	-.12	-.17*
PCI	.50*	.25*	.09	.61*	.21*	-.03	N/A
IP/5F	.22*	-.12	-.10	.37*	.25*	-.10	N/A
NEO-PI-R	.31*	-.12*	-.24*	.47*	.46*	-.20*	-.08*
Conscientiousness							
Goldberg Big Five	.10	.24*	-.26*	-.07	.36*	-.17	-.08
PCI	.24*	.39*	-.06	.17*	.59*	.08	N/A
IP/5F	.22*	.35*	.08	.30*	.49*	.19*	N/A
NEO-PI-R	.24*	.37*	-.05	.08	.42*	.05	.16*
Neuroticism/Emotional Stability							
Goldberg Big Five	.70*	.39*	-.04	.27*	.01	.28*	.11
PCI	.69*	.59*	-.02	.46*	.25*	.06	N/A
IP/5F	-.66*	-.50*	-.16*	-.31*	-.32*	-.26*	N/A
NEO-PI-R	-.72*	-.53*	-.08*	-.27*	-.22*	-.15*	-.17*
Openness							
Goldberg Big Five	.05	.22*	-.04	-.01	.03	.33*	.35*
PCI	.12	.36*	.15	.17*	-.05	.57*	N/A
IP/5F	.11	.44*	.51*	.25*	-.15*	.69*	N/A
NEO-PI-R	.01	.20*	.38*	.19*	-.31*	.52*	.24*

Note. Data taken from tables in the HPI Manual (R. Hogan & J. Hogan, 2007). Goldberg Big Five $N = 168$; PCI $N = 154$; IP/5F $N = 200$; NEO-PI-R $N = 679$. * $p < .05$

Figure A1 Relationships between FFM Inventories and the HPI Scales



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

Empirical validation research conducted over the last 30 years provides a firm understanding of construct validity and the nature and range of job performance prediction. Meta-analyses of HPI scales indicate that the estimated true scale validities for predicting job performance are as follows: Adjustment (.43), Ambition (.35), Interpersonal Sensitivity (.34), Prudence (.36), Inquisitive (.34), and Learning Approach (.25) (J. Hogan, & Holland, 2003). Research to date also shows that the HPI produces no adverse impact against any racial/ethnic, gender, or age group. Overall, the HPI is a well-validated and reliable instrument that predicts job performance across occupations and organizations (Axford, 1998; J. Hogan & Holland, 2003). The HPI manual documents the development and psychometric properties in further detail (R. Hogan & J. Hogan, 2007).

Favorable reviews of the HPI appear in several sources including the Buros Institute of Mental Measurements' Thirteenth Mental Measurements Yearbook (Lobello, 1998; Axford, 1998), the British Psychological Society Psychological Testing Centre Test Reviews (Creed &

Shackleton, 2007; Marshall & Lindley, 2009), and the Oregon Research Institute (Goldberg, 2008). The research conducted by the Oregon Research Institute (using the HPI) compiled longitudinal data on major personality assessments from a community sample in Eugene-Springfield, Oregon in 1997 and 2007. The data is a comprehensive and objective source of validity evidence for the HPI. The results of these two studies indicate that the HPI has sufficient convergent and discriminant validity with other FFM measures (Goldberg, 2008).

A1.3.2 The Hogan Development Survey

In contrast to the FFM, which evaluates normal, day-to-day personality, there are also personality scales that measure dysfunctional interpersonal themes (R. Hogan & J. Hogan, 2009). These dysfunctional dispositions represent flawed interpersonal strategies that (a) reflect one's distorted beliefs about others and (b) negatively influence careers and life satisfaction (Bentz, 1985; J. Hogan, R. Hogan, & Kaiser, 2011; R. Hogan & J. Hogan, 1997, 2009; Leslie & Van Velsor, 1996). These behavioral tendencies emerge when people encounter stressful or novel situations and when they let down their guard – or stop considering how their actions affect others. These deeply ingrained personality characteristics reflect maladaptive coping strategies that coexist with normal, day-to-day personality.

Dysfunctional personality characteristics reflect flawed interpersonal strategies people use to negotiate for status and acceptance. These tendencies develop during childhood as strategies for dealing with criticism or feelings of inadequacy. Horney (1950), in what may be the first taxonomy of flawed interpersonal outcomes, identified three major domains of flawed dispositions: (a) managing personal inadequacies by forming alliances (i.e., moving toward people), (b) managing personal insecurities by avoiding others (i.e., moving away from people), and (c) managing personal insecurities by dominating or intimidating others (i.e., moving against people). Over time, these behavioral strategies become associated with a person's reputation and can impede job performance and career success.

Researchers conceptualize poor employee performance in at least two mutually exclusive ways. One view argues that failure is synonymous with the absence of the requisite characteristics needed for success (Bray & Howard, 1983). A second view contends that failure has more to do with exhibiting undesirable qualities (i.e., derailing characteristics) than lacking the requisite ones (J. Hogan et al., 2010; R. Hogan & J. Hogan, 2001). This second position is intriguing because it suggests a different perspective from which to understand causes of employee failure.

The Five-Factor Model is a cross-section of personality at the competent end of the distribution. At the opposite end of the spectrum of personality are clinical disorders, or sustained patterns of maladaptive feeling, thinking, and behavior. However, personalities do not exist as opposite extremes, where each individual is either “clinically disordered” or “competent.” Rather, these descriptors exist as anchors on opposite ends of a continuum of functioning. Between these extremes lies a gray area previously ignored by personality researchers. In this gray area, an individual's personality may be considered “normal,” though that person may exhibit certain quirks or “dysfunctional dispositions” that, while flawed, do not rise to the level of clinically disordered functioning. The HDS serves as a measure of these

“dysfunctional disorders,” or the negative characteristics of personality that may adversely affect the lives of otherwise normal adults. In the context of personnel selection, the HDS identifies applicants whose behavior, over time, will erode relationships with others because of flawed interpersonal strategies.

Hogan consulted three primary sources for scale development: (1) unique themes of behavior that are suggested by the personality disorders but that are common expressions of normal personality, (2) managerial derailment literature (cf. J. Hogan et al., 2010), and (3) performance appraisals (Millikin-Davies, 1992; Shipper & Wilson, 1992; Sorcher, 1985; White & DeVries, 1990). These sources suggested 11 dysfunctional dispositions that can impede job performance and lead to career difficulties. These 11 dysfunctional dispositions are defined as follows:

- **Excitable:** volatile and inconsistent, being enthusiastic about new persons or projects and then becoming disappointed with them
- **Skeptical:** cynical, distrustful, overly sensitive to criticism, and questioning others’ true intentions
- **Cautious:** resistant to change and reluctant to take even reasonable chances for fear of being evaluated negatively
- **Reserved:** socially inept and lacking interest in or awareness of the feelings of others
- **Leisurely:** autonomous, indifferent to other people’s requests, and becoming irritable when they persist
- **Bold:** unusually self-confident and, as a result, reluctant to admit mistakes or listen to advice, and has difficulty learning from experience
- **Mischievous:** enjoys taking risks and testing the limits
- **Colorful:** expressive, dramatic, and wanting to be noticed
- **Imaginative:** acting and thinking in creative and sometimes unusual ways
- **Diligent:** careful, precise, and critical of others’ performance
- **Dutiful:** eager to please, reliant on others for support, and reluctant to take independent action

Empirical validation research conducted over the last 10 years provides a firm understanding of the construct validity and the nature and range of job performance outcomes predicted by the HDS scales. Hogan reports construct validity evidence in the assessment manual. Scale correlations with non-test behavior and observer ratings appear in R. Hogan and J. Hogan (2001, 2009). Additionally, research indicates no adverse impact associated with the HDS against any racial/ethnic, gender, or age groups. The HDS manual documents the development and psychometric properties in further detail (R. Hogan & J. Hogan, 2009).

Favorable reviews of the HDS appear in the Buros Institute of Mental Measurement’ *The Nineteenth Mental Measurements Yearbook* (Axford & Hayes, 2014), the British Psychological Society Psychological Testing Centre *Test Reviews* (Hodgkinson & Robertson, 2007), and the Oregon Research Institute (Goldberg, 2008). The Oregon Research Institute research on the HDS compiled longitudinal data on a variety of personality assessments from a community sample in Eugene-Springfield Oregon in 2007. Results show desirable convergent and discriminant validity of the HDS with other personality measures (R. Hogan & J. Hogan, 2009).

It is important to note that the HDS is neither intended to, nor appropriate for, diagnosing mental illness; rather, the HDS is a measure of normal personality characteristics that hinder the ability to build relationships and accomplish goals in organizational contexts. Because of this, a primary consideration shaping the development of the HDS concerned the actual content of the items. Because the HDS is intended for use in employment contexts — as opposed to being used to make medical or mental health status evaluations — the items reflect themes from the world of work. That is, the item content revolves around how one is perceived at work, how one relates to supervisors and co-workers, one's attitudes about competition and success, etc. Further, Hogan did not validate the HDS against clinical diagnoses, but against descriptions provided by participants' close working associates (Fico, R. Hogan, & J. Hogan, 2000; R. Hogan & J. Hogan, 2009). Aside from these linear relations between the HDS and observers' ratings and descriptions, Benson and Campbell (2007) demonstrated curvilinear relations between HDS factors and observer evaluations of managers. This has clear practical implications, as taking a strength to the extreme is often detrimental to performance, and in some cases, performance suffers even when managers show a slight tendency to exaggerate their strengths (Kaplan & Kaiser, 2009).

A.1.3.3 The Motives, Values, Preferences Inventory

The MVPI (J. Hogan & R. Hogan, 1996; 2010) serves two distinct purposes. First, it allows for an evaluation of fit between an individual and an organization, an important index given that greater similarity between individual and organizational values facilitates successful person-organization fit. Person-organization fit is important because, no matter how talented and hard-working a person may be, if the individual's values are incompatible with those of the larger culture, then he or she will not be as effective as his or her talent might predict. Second, the MVPI is a direct reflection of those areas that serve as motivators for an individual. Such information can be beneficial in a variety of organizational functions (e.g., placing individuals, building teams, designing reward systems, etc.).

MVPI scales represent dimensions with a historic presence in the literature on motivation, as Hogan reviewed 80 years of theory and research on motives, values, and interests (i.e. Spranger, 1928; Allport, 1961; Murray, 1938; Allport, Vernon, and Lindzey, 1960; Holland, 1966; 1985). The MVPI is comprised of items derived rationally from hypotheses about the likes, dislikes, and aversions of the "ideal" exemplar of each motive. Each scale is composed of five themes: (a) Lifestyles, which concern the manner in which a person would like to live; (b) Beliefs, which involve "shoulds", ideals, and ultimate life goals; (c) Occupational Preferences, which include the work an individual would like to do, what constitutes a good job, and preferred work materials; (d) Aversions, which reflect attitudes and behaviors that are either disliked or distressing; and (e) Preferred Associates, which include the kind of persons desired as coworkers and friends. The resulting 10 scales are defined as follows:

- **Aesthetics:** creative and artistic self-expression
- **Affiliation:** frequent and varied social interaction
- **Altruistic:** actively helping others and improving society
- **Commerce:** business activities, money, and financial gain
- **Hedonism:** fun, good company, and good times

- **Power:** competition, achievement, and being influential
- **Recognition:** fame, visibility, and publicity
- **Science:** ideas, technology, and rational problem solving
- **Security:** certainty, predictability, and risk free environments
- **Tradition:** history, rituals, and old-fashioned virtues

The MVPI is an organization-specific performance predictor (J. Hogan & R. Hogan, 1996; 2010). Researchers have used the MVPI in hundreds of validity generalization and criterion-related validation studies to predict occupational performance across a range of jobs and industries (e.g. Shin & Holland, 2004). The MVPI manual documents the development and psychometric properties in further detail (J. Hogan & R. Hogan, 2010). Favorable reviews of the MVPI appear in the Buros Institute of Mental Measurements' *The Fourteenth Mental Measurements Yearbook* (Roberts, 2001; Zedeck, 2001) and the British Psychological Society's Psychological Testing Centre's *Test Reviews* (Feltham & Loan-Clarke, 2007). The Oregon Research Institute included the MVPI in its 2007 data collection effort involving the community population in Eugene-Springfield, Oregon. This research effort is the largest of its kind and compiles longitudinal data on major personality and culture fit assessments.

A.1.3.4 Agile Leader Assessments

Quick Facts

- 4-point response scale
- HPI – 44 items
- HDS – 64 items
- MVPI – 50 items
- Comprised of items designed to measure the HPI, HDS, and MVPI models
- 4th grade reading level
- Carefully screened to minimize invasion of privacy
- 5-minute completion time per assessment
- Designed for ages 18 and older
- Internet administration and reporting

Hogan developed versions of the HPI, HDS, and MVPI to efficiently assess higher-order factors for each assessment. We used job analysis to identify the most critical personality characteristics for Agile Leaders and used synthetic validity to estimate relationships between Hogan scales and these characteristics.

Criterion-related and construct (structural) validity estimates are equivalent to estimates for other HPI, HDS, and MVPI forms. Psychometric properties are also comparable, although the forms used for the Agile Leader report do not include subscales. For more information, refer to the Comparison of Alternative Forms of the HPI, HDS, and MVPI whitepaper (Hogan Assessment Systems, 2017).

A2. COMPETENCY IDENTIFICATION

As more companies use competency models for a variety of purposes, the need to align personality instruments with customized competency models continues to grow. Many organizations conduct a job analysis in the process of developing their competency model. Hogan can use this information in linking personality to their competency model. Hogan can also conduct a job analysis for an organization to provide additional evidence of the critical personality characteristics, values, and competencies that we can use to build scoring recommendations for a specific job or organization. For organizations who have already conducted job analysis work on their own, Hogan will move directly to competency alignment as the next step in linking a model to personality. For these reasons, this section provides a general overview of the possible steps Hogan may take when creating a competency solution for an organization.

A2.2 Job Analysis

The Uniform Guidelines emphasizes the importance of conducting a complete job analysis for all content and construct validation studies. The guidelines require documentation of (a) work behaviors and/or outcomes, (b) the criticality of work behaviors or outcomes, and (c) the supporting evidence and rationale for grouping together two or more jobs (section 15, B, 3). This section describes the potential steps Hogan can take to identify the critical aspects of a job.

A2.2.1 Job Analysis Survey

Hogan designed a standardized on-line job analysis survey to identify the critical worker-oriented requirements in terms of the key personal requirements and critical competencies required for effective performance. The Job Evaluation Tool (“JET”; Hogan Assessment Systems, 2000) consists of four components: (a) the Performance Improvement Characteristics (PIC) survey, (b) the Derailment Characteristics Questionnaire (DCQ) survey, (c) the Motivational Improvement Characteristics (MIC) survey, and (d) the Competency Evaluation Tool (CET). Hogan administers the JET to SMEs – individuals highly familiar with the target job(s) and how the job(s) should ideally be performed. SMEs generally include both supervisors and high performers in the job(s) at hand.

As described by Foster, Gaddis, and Hogan (2012), we use intra-class correlations as the basis for computing inter-rater reliability estimates. However, we now use a two-way random model to test for the absolute agreement among ratings. Our rationale for using a two-way random model stems from the typical use case where (a) we have a sample of 8-10 SMEs ratings each section of the JET, (b) our SME sample is randomly drawn from a larger SME population, and (c) it’s important to control for SME rater effects as we assume rater variance is only adding noise to the reliability estimate. We also follow Foster et al.’s .80 or higher reliability requirement. In cases where estimates fall short of this benchmark, we either (a) ask for additional raters to complete the JET or (b) run outlier analyses to see if problematic raters can be removed from the reliability analyses.

A2.2.1a Performance Improvement Characteristics

As indicated by Foster et al. 2012:

“The FFM provides a systematic method for classifying individual differences in social and work behavior. These five dimensions, which are based on observers’ descriptions of others, capture the content of virtually any personality assessment (Wiggins & Pincus, 1992). As a result, the FFM represents the paradigm for modern personality research and is particularly relevant for job analysis because it provides a taxonomy of observer ratings. Applications of the FFM for job analysis tell us about the reputation of individuals who exhibit behaviors associated with successful job performance.” (p.251-253)

Foster et al. provide additional justification for the development of the PIC:

“The development of the PIC was based on research using the FFM structure with adjective checklist item content to indicate worker requirements (Hogan & Arneson, 1987). SMEs used this checklist to describe the characteristics of an ideal employee in a specific job. This method yielded positive results and suggested that a similar approach could identify important worker characteristics required for a range of jobs. For example, researchers found that the checklist reliably differentiated between jobs, both supervisors and high-performing incumbents agreed on the profile of the ideal workers, and the profile of the ideal *worker* differed from that of the ideal *person* (Hogan & Rybicki, 1998). Based on these findings, professionals can use the PIC, in conjunction with test validation research for personnel selection and development, for any job where people interact with others.” (p.253)

The PIC job analysis identifies (a) the personal characteristics needed to successfully execute the requirements of a job and (b) the degree to which possession of these personal characteristics improves job performance (Foster et al., 2012; J. Hogan & Rybicki, 1998). SMEs rated the 48 PIC items using a scale ranging from 0 (*Does Not Improve Performance*) to 3 (*Substantially Improves Performance*). For sample PIC item descriptions, see Table A4.

Table A4 PIC Items

1	Is steady under pressure	2	Is not easily irritated by others
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The PIC is not intended for use in pre-employment decision-making. It is a job analysis tool designed solely to help identify the personal characteristics that are critical for success in a given job. Regardless, job analysis tools such as the PIC should provide documentation supporting the reliability and accuracy of scores. Results reported in the manual indicate that PIC scales' internal consistency reliability estimates range between .76 (Adjustment) and .87 (Interpersonal Sensitivity); average internal consistency is .83. Test-retest reliability estimates based on at least a 1-month interval, range between .60 (Learning Approach) and .84 (Inquisitive); the average test-retest reliability is .71. Research indicates that the PIC differentiates between jobs, and scores on the PIC scales correspond to scales on the HPI (R. Hogan & J. Hogan, 1995, 2007) that predict successful job performance (Foster et al., 2012; Meyer & Foster, 2007; Rybicki, 1997).

The 48 PIC items align conceptually and empirically with the Five-Factor Model and the HPI (refer to Table A5).

Table A5 HPI and PIC Scale Definitions

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

Because we use PIC scores to identify personal characteristics important for success in a job, it is essential that scores on the PIC identify HPI scales that are predictive of job performance. Meyer, Foster, and Anderson (2006) evaluated the validity of the PIC using multiple samples from the Hogan archive. They found that HPI profiles created using PIC results were more effective at predicting performance for target jobs than for other jobs. This research indicates that the PIC differentiates between jobs, and scores on PIC scales identify the HPI scales that predict job performance.

Providing validation results for a job analysis technique surpasses the guidelines and requirements described in either the *Uniform Guidelines* or *Principles*. In fact, the scientific literature contains virtually no discussion concerning empirical validation of a job analysis tool.

A2.2.1b Derailment Characteristics Questionnaire

Over 25 years ago, Bentz (1985) identified leadership styles associated with managerial derailment in the retail industry (e.g., playing politics, moodiness, and dishonesty). Researchers in several prominent U.S. consulting firms similarly concluded that others view managers who are technically competent, but who fail, as arrogant, vindictive, untrustworthy, selfish, emotional, compulsive, over-controlling, insensitive, abrasive, aloof, overly ambitious, or unable to delegate (Benson & Campbell, 2007; Dotlich & Cairo, 2003; McCall, Lombardo, & Morrison, 1988). Bentz’s observations overlap substantially with those from other organizational psychologists – that individuals with leadership responsibilities who demonstrate dysfunctional dispositions leading to an inability to build an effective team will ultimately fail or become less than optimally effective in their roles.

To tap these constructs, the DCQ identifies personal characteristics that can inhibit performance in a job, and assesses the degree to which these personal characteristics degrade job performance. Although different attributes are associated with effectiveness across different jobs, some common attributes are associated with incompetence and derailment across jobs, particularly those that require teamwork and leadership behaviors (J. Hogan et al., 2010). These attributes coexist with good interpersonal skills and technical competence, and may be difficult to detect in brief interactions, such as an interview. The DCQ asks SMEs to identify characteristics that inhibit performance and, therefore, constitute personality-based performance risk factors.

The DCQ contains 22 items across 11 dimensions. All items are rated using a scale ranging from 0 (*Does Not Degrade Performance*) to 3 (*Substantially Degrades Performance*), resulting in a total possible raw score of 6 for each dimension. For sample DCQ item descriptions, see Table A6.

Table A6 DCQ Items

1	Becomes emotional when dealing with difficult people	2	Becomes irritable when frustrated
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In contrast with the PIC, the DCQ instructions ask SMEs to rate personal characteristics based on the extent to which they *impair* job performance. Thus, characteristics that receive high ratings on the DCQ are more likely to detract from or inhibit effective job performance. The items align with the 11 HDS scales, as shown in Table A7.

Table A7 HDS and DCQ Scale Definitions

Scale Name	Definition - <i>The degree to which a person seems...</i>
Excitable	volatile and hard to please, enthusiastic about new persons or projects and then becoming disappointed with them
Skeptical	cynical, mistrustful, and doubtful of the true intentions of others
Cautious	to be conservative, careful, worried about making mistakes, and reluctant to take initiative for fear of being criticized
Reserved	to keep to oneself, to dislike working in teams, and to be indifferent to the moods of others
Leisurely	independent, refusing to be hurried, ignoring other peoples' requests, and becoming irritable if they persist
Bold	unusually self-confident, having strong feelings of entitlement, and reluctant to admit mistakes, listen to advice, or attend to feedback
Mischievous	to enjoy taking risks and testing the limits, being easily bored, and seeking excitement
Colorful	lively, expressive, dramatic, and wanting to be noticed
Imaginative	to act and think in creative and sometimes unusual ways
Diligent	meticulous, precise, and critical of the performance of others
Dutiful	eager to please, ingratiating, and reluctant to take independent action

A2.2.1c Motivational Improvement Characteristics

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

The MIC section of the JET assesses the environment in which an employee works and the values that help define ideal workgroup climate. These values include interests such as work quality, social interaction, helping others, profitability, enjoyment, accomplishment, recognition, technology, predictability, and adherence to established standards of conduct. The MIC provides a taxonomy that defines the organization's or the workgroup's occupational environment. The MIC contains 40 items across 10 dimensions that are rated using a scale ranging from 0 (*Does Not Describe the Work Group*) to 3 (*Substantially Describes the Work Group*), resulting in a total possible raw score of 12 for each dimension. For sample MIC item descriptions, see Table A8. The 40 items align with the 10 MVPI scales, as shown in Table A9.

Table A8 MIC Items

1	Focus on bottom-line results	2	Monitor budgets and spending closely
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Table A9 MVPI and MIC Scale Definitions

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

A2.2.1d Competency Evaluation Tool

Boyatzis (1982) extended the work of McClelland (1973) and 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. The *Principles* recognize that competency modeling is used by many organizations as a means for describing broad requirements for a wide range of jobs. Every existing competency model can be organized in terms of a “domain model” first proposed by Warrenfeltz (1995). The domain model is composed of four domains: (a) Intrapersonal skills, (b) Interpersonal skills, (c) Technical skills, and (d) Leadership skills. R. Hogan and Warrenfeltz (2003) argued that these four domains form a natural, overlapping developmental sequence, with development of the later skills depending on the appropriate development of the earlier skills. These domains also form a hierarchy of trainability, in which the earlier skills are harder to train than the later skills.

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

The CET is designed to serve as a comprehensive list of competencies that appear in (or can be translated from) the major taxonomic sources, including the Great Eight. The CET's development centered on a review of 21 competency models used across academic, commercial, and government settings. This development process ensured that the model is comprehensive and that it can be easily compared to and used in conjunction with other competency models (Hogan Assessment Systems, 2009).

The CET asks SMEs to indicate the degree to which each of 62 listed competencies is related to successful performance in the job or job family under study. Each listed competency is accompanied by a brief definition in Table A10.

Table A10 CET Items

1	Financial Acumen: Demonstrates keen insight and application of budgeting, financial policies and procedures
2	Goal Setting: Identifies short-term objectives and steps to achieve them
3	Industry Knowledge: Demonstrates an understanding of industry knowledge and trends
4	Information Analysis: Gathers, organizes, and analyzes diverse sources of information
5	Innovation: Generates creative ideas and perspectives
6	Political Awareness: Recognizes and works within the political environment of an organization
7	Presentation Skills: Effectively presents ideas and information to others
8	Problem Identification: Detects errors, gaps, and potential flaws in goals and tasks
9	Problem Solving: Identifies solutions given available information
10	Quality Orientation: Emphasizes producing quality products and/or meeting quality standards
11	Safety: Follows safety precautions and displays safe on-the-job behavior
12	Sales Ability: Effectively demonstrates, promotes, and sells products and services
13	Written Communication: Effectively expresses him or herself through written communication
14	Work Skills: Uses existing technology and job-relevant abilities to perform tasks
15	Active Listening: Listens and restates the ideas and opinions of others to improve mutual understanding
16	Building Relationships: Develops collaborative relationships to facilitate current or future goals
17	Citizenship: Goes beyond job requirements to help the organization
18	Influence: Persuades others to a desired result
19	Negotiation: Explores alternatives to reach outcomes acceptable to all parties
20	Oral Communication: Expresses himself/herself effectively through verbal communication
21	Organizational Commitment: Demonstrates loyalty and dedication to the organization
22	Service Orientation: Creates customer loyalty through courteous, timely, and helpful service
23	Social Engagement: Enjoys and seeks out interactions with others
24	Teamwork: Collaborates with others to achieve goals
25	Valuing Diversity: Respects, values, and leverages individual differences
26	Interpersonal Skills: Gets along well with others, is tactful, and behaves appropriately in social situations
27	Building Teams: Assembles cohesive groups based upon required skills, goals, and tasks
28	Business Acumen: Demonstrates keen insight and application of business policies and procedures
29	Decision Making: Uses sound judgment to make timely and effective decisions
30	Delegation: Assigns work based on task and skill requirements
31	Employee Development: Provides support, coaching, training, and career direction to peers and subordinates
32	Managing Change: Effectively implements new methods and systems
33	Managing Conflict: Manages hostility between individuals or groups when disagreements occur
34	Managing Performance: Monitors performance providing feedback for improvement as needed
35	Motivating Others: Fosters energy for and provides direction towards organizational goals
36	Resource Management: Coordinates people and materials to maximize productivity and efficiency
37	Strategic Planning: Develops strategies to accomplish long-term goals
38	Talent Management: Recruits, rewards, and retains individuals with critical skills and abilities
39	Leadership: Demonstrates general leadership ability and effectiveness
40	Achievement Orientation: Driven to accomplish goals and complete tasks
41	Ambiguity Tolerance: Deals comfortably with unclear situations and problems
42	Caring: Displays sensitivity towards the attitudes, feelings, or circumstances of others
43	Competitive: Driven to exceed the performance of others
44	Dependability: Performs work in a consistent and timely manner
45	Detail Orientation: Performs work with care, accuracy, and attention to detail
46	Flexibility: Willing to receive and accept new ideas, approaches, and strategies
47	Following Procedures: Adheres to directions, policies, and/or legal guidelines
48	Initiative: Takes action without the direction of others
49	Perseverance: Pursues goals despite obstacles and/or challenges
50	Planning/Organizing: Coordinates and directs routine activities effectively
51	Professionalism : Acts in accordance with job-related values, principles, and standards
52	Responsibility: Accepts personal accountability for actions regardless of outcomes
53	Risk Management: Takes appropriate chances to achieve goals while considering possible negative consequences
54	Self Confidence: Believes in oneself to accomplish tasks/goals
55	Self Development: Actively acquires knowledge, skills, and abilities to remain current with job requirements
56	Stress Tolerance: Handles pressure without getting upset, moody, or anxious
57	Time Management: Plans work to maximize efficiency and minimize downtime
58	Trustworthiness: Acts with honesty and integrity
59	Vigilance: Remains alert and focused when performing monotonous tasks
60	Work Attitude: Displays a positive disposition towards work
61	Work Ethic: Exhibits hard work and diligence
62	Intrapersonal Skills: Demonstrates the appropriate motivation, attitude, and self-control to effectively perform on the job

Raters are asked to evaluate each competency using a five-point scale ranging from 0 (*Not associated with job performance*) to 4 (*Critical to job performance*). Generally, competencies considered critical are those that receive mean ratings greater than 3, where the scale anchor is labeled “*Important to performance.*” The SME ratings provide a basis for structural models to examine comparability of job domains and their competencies across jobs within and across families (J. Hogan, Davies, & R. Hogan, 2007).

Using the most highly rated CET items across SMEs, Hogan can identify the critical competencies for a job. An organization can use this information to build their competency model. Hogan maps these CET items to the updated HCM competencies (Hogan Assessment Systems, 2016; see Table A11).

Table A11 Crosswalk between Competency Labels in CET and the Hogan Competency Model

CET Label	HCM Label	HCM Definition
Achievement Orientation	Driving for Results	Accomplishes goals, completes tasks, and achieves results.
Active Listening	Listening to Others	Listens and restates the ideas and opinions of others to improve mutual understanding.
Ambiguity Tolerance	Dealing with Ambiguity	Comfortably handles unclear or unpredictable situations.
Building Relationships	Relationship Building	Develops collaborative relationships to facilitate current and future objectives.
Building Teams	Team Building	Assembles productive groups based upon required skills, goals and tasks.
Business Acumen	Business Insight	Applies business knowledge to achieve organizational goals and objectives.
Caring	Caring about People	Displays sensitivity towards the attitudes, feelings, or circumstances of others.
Citizenship	Organizational Citizenship	Exceeds job requirements to help the organization.
Competitive	Competing with Others	Strives to exceed others' performance.
Decision Making	Decision Making	Uses sound judgment to make timely and effective decisions.
Delegation	Delegating	Assigns work to others based on tasks, skills, and workloads.
Dependability	Dependability	Performs work in a reliable, consistent, and timely manner.
Detail Orientation	Detail Focus	Performs work with care, accuracy, and attention to detail.
Employee Development	Developing People	Provides support, coaching, training, and career direction to others.
Financial Acumen	Financial Insight	Applies financial knowledge to achieve organizational goals and objectives.
Flexibility	Flexibility	Changes direction as appropriate based on new ideas, approaches, and strategies.
Following Procedures	Rule Compliance	Adheres to directions, policies, and/or legal guidelines.
Goal Setting	Setting Goals	Identifies short-term objectives and steps to achieve them.
Industry Knowledge	Industry Insight	Applies knowledge of industry trends and outlooks to achieve organizational goals and objectives.
Influence	Influencing Others	Persuades others to help achieve organizational goals and objectives.
Information Analysis	Processing Information	Gathers, organizes, and analyzes diverse sources of information.
Initiative	Taking Initiative	Takes action without needing direction from others.
Innovation	Driving Innovation	Stimulates creative ideas and perspectives that add value.
Interpersonal Skills	Leveraging People Skills	Gets along well with others, is tactful, and behaves appropriately in social situations.
Intrapersonal Skills	Self Management	Demonstrates appropriate motivation, attitude, and self-control.
Leadership	Leading Others	Demonstrates general leadership ability and effectiveness.
Managing Change	Driving Change	Champions new methods, systems, and processes to improve performance.
Managing Conflict	Managing Conflict	Resolves hostilities and disagreements between others.
Managing Performance	Driving Performance	Provides guidance and feedback to maximize performance of individuals and/or groups.
Motivating Others	Inspiring Others	Motivates others to accomplish organizational goals.
Negotiation	Negotiating	Explores alternatives to reach outcomes acceptable to all parties.
Oral Communication	Verbal Communication	Expresses ideas and opinions effectively in spoken conversations.
Organizational Commitment	Engagement	Demonstrates loyalty and commitment through enthusiasm and extra effort.
Perseverance	Overcoming Obstacles	Pursues goals and strategies despite discouragement or opposition.
Planning/Organizing	Planning and Organizing	Coordinates and directs activities to help achieve business objectives.

Table A11 Crosswalk between Competency Labels in CET and the Hogan Competency Model (continued)

CET Label	HCM Label	HCM Definition
Political Awareness	Political Savvy	Recognizes, interprets, and works within the political environment of an organization.
Presentation Skills	Presenting to Others	Conveys ideas and information to groups.
Problem Identification	Anticipating Problems	Forecasts and detects errors, gaps, and potential flaws.
Problem Solving	Solving Problems	Identifies solutions given available information.
Professionalism	Professionalism	Acts in accordance with job-related values, principles, and standards.
Quality Orientation	Quality Focus	Strives to meet quality standards and produce quality work products.
Resource Management	Managing Resources	Coordinates people and financial and material capital to maximize efficiency and performance.
Responsibility	Accountability	Accepts responsibility for one's actions regardless of outcomes.
Risk Management	Taking Smart Risks	Evaluates tradeoffs between potential costs and benefits and acts accordingly.
Safety	Safety Focus	Attends to precautions and proper procedures to guard against work-related accidents and injuries.
Sales Ability	Sales Focus	Generates revenue by promoting products and services to others.
Self Confidence	Displaying Confidence	Projects poise and self-assurance when completing work tasks.
Self Development	Self Development	Actively acquires new knowledge and skills to remain current with and/or grow beyond job requirements.
Service Orientation	Customer Focus	Provides courteous, timely, and helpful service to encourage client loyalty.
Social Engagement	Networking	Builds and maintains a system of strategic business connections.
Strategic Planning	Driving Strategy	Directs effort to achieve long-term business objectives.
Stress Tolerance	Handling Stress	Manages pressure without getting upset, moody, or anxious.
Talent Management	Attracting Talent	Recruits, rewards, and retains individuals with needed skills and abilities.
Teamwork	Teamwork	Collaborates with others to achieve goals.
Time Management	Time Management	Plans and prioritizes work to maximize efficiency and minimize downtime.
Trustworthiness	Integrity	Acts honestly in accordance with moral or ethical principles.
Valuing Diversity	Leveraging Diversity	Respects and values individual differences to obtain a desired effect or result.
Vigilance	Staying Alert	Remains focused when performing monotonous tasks.
Work Attitude	Positive Attitude	Displays a positive disposition towards work.
Work Ethic	Working Hard	Consistently strives to complete tasks and assignments at work.
Work Skills	Leveraging Work Skills	Applies technology and job-relevant abilities to complete work tasks.
Written Communication	Written Communication	Expresses ideas and opinions effectively in writing.

A2.3 Competency Alignment

Companies wanting to use competency models for a variety of purposes partner with Hogan to align their models with personality and values. Once an organization has developed and defined their competency model, Hogan can align it to the HCM to use data from the JET and Hogan archive to answer critical research questions. Hogan can compare these results with CET results to verify that competencies in an organization's existing model are important for performance. It is also a critical step in identifying the personality scales that are predictive of performance.

Although competency models invariably differ across organizations, similarities often exist. HRD developed the HCM to capture these similarities by continually reviewing a wide range of existing competency models throughout the development process. As a result, HRD can easily map HCM competencies to the vast majority of competencies presented in other models.

During the alignment process, Hogan SMEs, consisting of expert Ph.D.- and Masters-level practitioners, evaluate both competency models and indicate which HCM competencies align with each of an organization's competencies. Often, competencies are broad and align with multiple HCM competencies. When that is the case, HRD can combine HCM competencies to adequately align with an organization's model. Last, HRD resolves disagreements among SMEs through a group decision-making task where they discuss the disagreement(s) and come to a consensus as to which HCM competency best aligns with the corresponding competency.

A3. SYNTHETIC/JOB COMPONENT VALIDITY

Once Hogan has identified the relevant competencies in the HCM based on job analysis and/or competency alignment results, we can use synthetic/job component validation research to identify the best predictors of performance dimensions that directly align to each competency. The next section describes the approach HRD takes to conduct synthetic validation research.

A3.1 Synthetic Validity

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

Lawshe (1952) introduced synthetic validity over 50 years ago. With a few notable exceptions (e.g., Guion, 1965; McCormick, DeNisi, & Shaw, 1979; Primoff, 1959), early researchers largely ignored the approach because they believed that assessment validity was specific to situations. The interpretive review and demonstration by Mossholder and Arvey (1984) is a rare exception. Mossholder and Arvey defined synthetic validity as “the logical process of inferring test-battery validity from predetermined validities of the tests for basic work components” (p. 323). If we know the key components of a job, we can review prior criterion-related studies predicting those components. We then “synthesize” the valid predictors of the key job components into an assessment battery for the new job (Balma, 1959; Lawshe, 1952). Since Mossholder and Arvey’s initial demonstration, synthetic validity has gained more support and popularity (e.g. Hoffman, Holden, & Gale, 2000; Jeanneret & Strong, 2003; Johnson & Carter, 2010; Johnson, Carter, Davison, & Oliver, 2001; Johnson et al., 2010; McCloy, 1994; 2001; Scherbaum, 2005).

Brannick and Levine (2002) point out that synthetic validity approaches allow us to build up validity evidence from small samples with common job components. Johnson and Carter (2010) showed that synthetic validity (a) produced coefficients quite similar to coefficients obtained from more traditional local validation research and (b) may be more advantageous when developing selection batteries for newly created jobs, given that tenured job incumbents are needed for criterion-related validation studies.

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

When test battery validity is inferred from evidence showing that tests measure broad characteristics necessary for job performance, the

process resembles a construct validation strategy. When scores are correlated with component performance measures, the process involves criterion-related validation. The nature of the tests used in the process (e.g., work sample vs. aptitude) may determine in part the appropriate validation strategy. (p. 323)

Job Component Validity (hereafter, JCV: McCormick et al., 1979) is one type of synthetic validity. Jeanneret (1992) described JCV as falling “within the rubric of construct validity” (p. 84). Researchers have primarily used JCV to study the cognitive demands of jobs by correlating job dimensions using Position Analysis Questionnaire data (Jeanneret, 1992; Hoffman, Rashkovsky, & D’Egidio, 2007). Hoffman and McPhail (1998) examined the accuracy of JCV for predicting the observed validity of cognitive tests in clerical jobs. Few similar analyses are available for personality predictors, although Mecham (1985) and D’Egidio (2001) provide notable exceptions. Because the concept of synthetic validity has evolved over the years, Hogan uses interchangeably the terms criteria, performance dimensions, job components, work components, competencies, and domains of work.

A3.1.1 Gathering Synthetic Validity Evidence

Lemming, Nei, & Foster (2016) mapped each of the criteria from over 375 criterion-related validity studies in the Hogan archive onto the Hogan competencies and conducted a meta-analysis for each Hogan scale-by-competency relationship. These meta-analyses provide stable estimates of the relationships between the 7 HPI scales, the 11 HDS scales, and the critical competencies as rated by SMEs. They report operational validities, which they corrected for sampling error, unreliability in the criterion measure, dichotomization (when necessary), and range restriction. Based on this evidence, Hogan can identify the characteristics associated with critical competencies.

A4. SCALE SELECTION

All competency-based research solutions start with aligning each competency to a matching competency from the HCM (Hogan Assessment Systems, 2016). Those competency alignments allow Hogan researchers to identify the Hogan scales that are empirically or theoretically related to a competency and use those scales to predict the competency. To make scale decisions, Hogan assimilates all available information from the (a) job analysis and (b) synthetic/job component validity.

In addition to empirical synthetic/job component validation evidence, Hogan uses a content validity approach to select critical personality characteristics and values. This approach uses SMEs who are knowledgeable of the HPI, HDS, and MVPI, as well as the critical competencies. The SMEs include members of Hogan's Research and Consulting Teams. The Hogan team members have extensive experience using assessments for selection and leadership development. They have worked with many large organizations in numerous industries, including transportation, manufacturing, financial services, pharmaceutical, healthcare, and retail.

Hogan integrates both empirical and qualitative evidence to develop scale recommendations for each competency. As part of each study's content validation process, the Hogan team members may reference the following qualitative information sources: (a) an organization's competency model, (b) the HPI, HDS, and MVPI technical manuals (R. Hogan & J. Hogan, 2007; R. Hogan & J. Hogan, 2009; J. Hogan & R. Hogan, 2010), (c) *The Hogan Guide: Interpretation and Use of the Hogan Inventories* (R. Hogan, J. Hogan, & Warrenfeltz, 2007), and (d) past profiles created for similar competencies. Quantitative results can be derived from the results of the job analysis and from synthetic validity.

After identifying the qualitatively- and quantitatively-linked scales, the full set of SMEs examine the scales across each competency to ensure there are no redundancies. In addition, this step safeguards against one scale dominating the model. The SMEs also reviewed the job analysis data to ensure scale representation matches the results. Hogan then reviews the scale recommendations with the organization for their approval.

A5. RECOMMENDATIONS

For each competency in an organization's model, Hogan provides scoring recommendations. There are several different types of competency scoring from which an organization can choose. For more information outlining these approaches, please see the [Research Approaches to Aligning Hogan Scales with Competencies](#) whitepaper (Hogan Assessment Systems, 2014). In most cases, Hogan recommends Algorithm scoring.

A5.1.2 Algorithms

Mathematical algorithm scoring use normative percentile scores instead of raw scores, which unit weights the scales included in each algorithm and facilitates interpretation. With scale-based algorithms, we can customize the assessments included and reporting output. We provide an example below:

- Innovation = (Ambition + Inquisitive + (100 - Skeptical) + (100 - Cautious) + Power)/5

One benefit of Algorithms is that we can provide both a score from 0-100 as well as candidate recommendations levels making the results much easier to interpret. This method also provides predictive validity and flexibility. Algorithms are inherently compensatory meaning candidates don't "fail" by having one low score on any given scale. However, continuous competency scoring does not easily facilitate scale-based feedback/coaching because it can be challenging to determine developmental areas around specific Hogan scales.

A5.1.2a Custom Norms

Once an algorithm has been created, an organization may want to examine how each individual scores in comparison to a specific population. For these projects, HRD calculates a score based on an algorithm using normative percentiles scores. This score is considered a raw competency score. This raw score is converted to a percentile score in reference to a norm group or relevant comparison population. Candidate recommendations levels are then based on the percentile score. The advantage of this method is that it allows an organization to interpret each competency score based on how that person's score compares to other individuals in a relevant comparison group.

A5.3 Uses and Applications

Once Hogan establishes that the assessments are valid and the recommended scoring should not discriminate unfairly, we recommend that the client administer the assessments used to build the profile to applicants and score the assessments using the recommended scales and cutoff scores in the suggested profile. Therefore, employment suitability can be determined, in part, by assessing scores on the recommended assessment scales. When handling and sharing score data, applicant confidentiality should always be maintained and security procedures put in place to ensure data integrity and applicant privacy. Whenever possible, administration conditions should always be monitored and standardized. However, with online assessments, standardized conditions are not guaranteed due to the nature of the remote testing environment.

The following procedures will help companies use and monitor the selection process. First, the applicant flow should be examined closely to determine if the recommended cutoff scores allow enough applicants to pass while screening out applicants who are likely to be poor performers. Cutoff scores on which everyone fails are just as ineffective as those on which everyone passes. Second, companies should maintain records of test scores by demographic group, as indicated in the Uniform Guidelines, to monitor the possibility of adverse impact resulting from the use of the assessments. Third, the company should choose the appropriate administrative personnel to review the entire selection process to determine if any procedures can be improved. This step should be taken after the selection process has been used for at least one year but not more than five years. Test validation experts recommend that the results obtained in a validation study be reviewed and updated after five years (Schmit, Lundquist, & Beckham, 2008). Finally, performance appraisal and/or monitoring data should be maintained, if possible, on new incumbents who are hired using this selection procedure. These data will provide a check on the validity of the selection procedure and will help determine utility. In addition, Hogan recommends conducting follow-up analyses on the people hired using the assessments and exploring the utility and bottom-line impact of the proposed selection system. For further information concerning our research process, please contact:

Hogan Assessment Systems
11 S. Greenwood
Tulsa, Oklahoma 74120
(918) 749-0632

A5.4 Accuracy and Completeness

Hogan completes all procedures within the recommendations of both the *Uniform Guidelines* and the *Principles*. Hogan derives results strictly from the research processes described above and archived study results and does not embellish, falsify, or alter results in any manner.

Hogan attests to the accuracy of the data collection, analysis, and reporting procedures used in all validity studies. Hogan enters all data collected into a database and computes results using SPSS statistical software.

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Appendix A: Academic and Company Competency Models

Model	Reference	Model Type
Borman & Brush	Borman, W. C., & Brush, D. H. (1993). More progress toward a taxonomy of managerial performance requirements. <i>Human Performance</i> , 6, 1-21.	Academic
Campbell, McCloy, Oppler, & Sager	Campbell, J. P., McCloy, R. A., Oppler, S. H., & Sager, C.E. (1993). A theory of performance. In N. Schmitt & W. C. Borman (Eds.), <i>Personnel selection in organization</i> (pp. 35-70). San Francisco, CA: Jossey-Bass.	Academic
Flanagan	Flanagan, J. C. (1951). Defining the requirements of the executive's job. <i>Personnel Psychology</i> , 28, 28-35	Academic
Hemphill	Hemphill, J. K. (1959). Job descriptions for executives. <i>Harvard Business Review</i> , 37, 55-67.	Academic
Katzell	Katzell, R. A., Barret, R. S., Vann, D. H., & Hogan, J. M. (1968). Organizational correlates of executives roles. <i>Journal of Applied Psychology</i> , 52, 22-28.	Academic
Luthans & Lockwood	Luthans, F., & Lockwood, D. L. (1984). Toward an observation system for measuring leader behavior in natural settings. In J. G. Hunt, D. Hosking, C. Schriesheim, & R. Stewart (Eds.), <i>Leaders and managers: International perspectives on managerial behavior and leadership</i> (pp. 117-141). New York, NY: Pergamon Press.	Academic
Morse & Wagner	Morse, J. J., & Wagner, F. R. (1978). Measuring the process of managerial effectiveness. <i>Academy of Management Journal</i> , 21, 23-35.	Academic
Prien	Prien, E. P. (1963). Development of a supervisor description questionnaire. <i>Journal of Applied Psychology</i> , 47, 10-14.	Academic
Tett, Guterman, Bleier, & Murphy	Tett, R. P., Guterman, H. A., Bleier, A., & Murphy, P. J. (2000). Development and content validation of a "hyperdimensional" taxonomy of managerial competence. <i>Human Performance</i> , 12(3), 205-251.	Academic
Tornow & Pinto	Tornow, W. W. & Pinto, P. R. (1976). The development of a managerial job taxonomy: A system for describing, classifying, and evaluating executive positions. <i>Journal of Applied Psychology</i> , 61, 410-418.	Academic
Woffard	Woffard, J. C. (1970). Factor analysis of managerial behavior variables. <i>Journal of Applied Psychology</i> , 54, 169-173.	Academic
Yukl & Lepsinger	Yukl, G. A., & Lepsinger, R. (1992). An integrating taxonomy of manager behavior: Implications for improving managerial effectiveness. In J. W. Jones, B. D. Steffy, D. W. Bray (Eds.), <i>Applying psychology in business: The manager's handbook</i> (pp. 563-573). Lexington, MA: Lexington Books.	Academic

Appendix A: Academic and Company Competency Models (Continued)

Model	Reference	Model Type
Bigby Havis	https://www.bigby.com/systems/assessv2/admin/whitepaper.htm	Commercial
Jeanneret & Associates	Tett, R. P., Guterman, H. A., Bleier, A., & Murphy, P. J. (2000). Development and content validation of a “hyperdimensional” taxonomy of managerial competence. <i>Human Performance</i> , 12(3), 205-251.	Commercial
Lominger	Lombardo, M. M. & Eichinger, R. W. (2002). <i>The leadership machine</i> (3 rd ed.). Minneapolis, MN: Lominger Limited Inc.	Commercial
	Lombardo, M. M. & Eichinger, R. W. (2003). <i>FYI: For your improvement</i> (3 rd ed.). Minneapolis, MN: Lominger Limited Inc.	
PDI	Tett, R. P., Guterman, H. A., Bleier, A., & Murphy, P. J. (2000). Development and content validation of a “hyperdimensional” taxonomy of managerial competence. <i>Human Performance</i> , 12(3), 205-251.	Commercial
Select International	Internal Company Source	Commercial
SHL	Bartram, D. (2005). The great eight competencies: A criterion-centric approach to validation. <i>Journal of Applied Psychology</i> , 90(6), 1185-1203.	Commercial
Career One Stop (U.S. Department of Labor-sponsored Web site)	www.careeronestop.org	Governmental
O*NET	www.onetcenter.org	Governmental
Office of Personnel Management	www.opm.com	Governmental

Appendix B: Hogan Competency Model

Competency Number	Competency	Definition	Domain
1	Accountability	Accepts responsibility for one's actions regardless of outcomes.	Intrapersonal
2	Anticipating Problems	Forecasts and detects errors, gaps, and potential flaws.	Business
3	Attracting Talent	Recruits, rewards, and retains individuals with needed skills and abilities.	Leadership
4	Business Insight	Applies business knowledge to achieve organizational goals and objectives.	Leadership
5	Caring about People	Displays sensitivity towards the attitudes, feelings, or circumstances of others.	Intrapersonal
6	Competing with Others	Strives to exceed others' performance.	Intrapersonal
7	Customer Focus	Provides courteous, timely, and helpful service to encourage client loyalty.	Interpersonal
8	Dealing with Ambiguity	Comfortably handles unclear or unpredictable situations.	Intrapersonal
9	Decision Making	Uses sound judgment to make timely and effective decisions.	Leadership
10	Delegating	Assigns work to others based on tasks, skills, and workloads.	Leadership
11	Dependability	Performs work in a reliable, consistent, and timely manner.	Intrapersonal
12	Detail Focus	Performs work with care, accuracy, and attention to detail.	Intrapersonal
13	Developing People	Provides support, coaching, training, and career direction to others.	Leadership
14	Displaying Confidence	Projects poise and self-assurance when completing work tasks.	Intrapersonal
15	Driving Change	Champions new methods, systems, and processes to improve performance.	Leadership
16	Driving for Results	Accomplishes goals, completes tasks, and achieves results.	Intrapersonal
17	Driving Innovation	Stimulates creative ideas and perspectives that add value.	Business
18	Driving Performance	Provides guidance and feedback to maximize performance of individuals and/or groups.	Leadership
19	Driving Strategy	Directs effort to achieve long-term business objectives.	Leadership
20	Engagement	Demonstrates loyalty and commitment through enthusiasm and extra effort.	Interpersonal
21	Financial Insight	Applies financial knowledge to achieve organizational goals and objectives.	Business
22	Flexibility	Changes direction as appropriate based on new ideas, approaches, and strategies.	Intrapersonal
23	Handling Stress	Manages pressure without getting upset, moody, or anxious.	Intrapersonal

Appendix B: Hogan Competency Model (Continued)

Competency Number	Competency	Definition	Domain
24	Industry Insight	Applies knowledge of industry trends and outlooks to achieve organizational goals and objectives.	Business
25	Influencing Others	Persuades others to help achieve organizational goals and objectives.	Interpersonal
26	Inspiring Others	Motivates others to accomplish organizational goals.	Leadership
27	Integrity	Acts honestly in accordance with moral or ethical principles.	Intrapersonal
28	Leading Others	Demonstrates general leadership ability and effectiveness.	Leadership
29	Leveraging Diversity	Respects and values individual differences to obtain a desired effect or result.	Interpersonal
30	Leveraging People Skills	Gets along well with others, is tactful, and behaves appropriately in social situations.	Interpersonal
31	Leveraging Work Skills	Applies technology and job-relevant abilities to complete work tasks.	Business
32	Listening to Others	Listens and restates the ideas and opinions of others to improve mutual understanding.	Interpersonal
33	Managing Conflict	Resolves hostilities and disagreements between others.	Leadership
34	Managing Resources	Coordinates people and financial and material capital to maximize efficiency and performance.	Leadership
35	Negotiating	Explores alternatives to reach outcomes acceptable to all parties.	Interpersonal
36	Networking	Builds and maintains a system of strategic business connections.	Interpersonal
37	Organizational Citizenship	Exceeds job requirements to help the organization.	Interpersonal
38	Overcoming Obstacles	Pursues goals and strategies despite discouragement or opposition.	Intrapersonal
39	Planning and Organizing	Coordinates and directs activities to help achieve business objectives.	Intrapersonal
40	Political Savvy	Recognizes, interprets, and works within the political environment of an organization.	Business
41	Positive Attitude	Displays a positive disposition towards work.	Intrapersonal
42	Presenting to Others	Conveys ideas and information to groups.	Business
43	Processing Information	Gathers, organizes, and analyzes diverse sources of information.	Business
44	Professionalism	Acts in accordance with job-related values, principles, and standards.	Intrapersonal
45	Quality Focus	Strives to meet quality standards and produce quality work products.	Business
46	Relationship Building	Develops collaborative relationships to facilitate current and future objectives.	Interpersonal

Appendix B: Hogan Competency Model (Continued)

Competency Number	Competency	Definition	Domain
47	Rule Compliance	Adheres to directions, policies, and/or legal guidelines.	Intrapersonal
48	Safety Focus	Attends to precautions and proper procedures to guard against work-related accidents and injuries.	Business
49	Sales Focus	Generates revenue by promoting products and services to others.	Business
50	Self Development	Actively acquires new knowledge and skills to remain current with and/or grow beyond job requirements.	Intrapersonal
51	Self Management	Demonstrates appropriate motivation, attitude, and self-control.	Intrapersonal
52	Setting Goals	Identifies short-term objectives and steps to achieve them.	Business
53	Solving Problems	Identifies solutions given available information.	Business
54	Staying Alert	Remains focused when performing monotonous tasks.	Intrapersonal
55	Taking Initiative	Takes action without needing direction from others.	Intrapersonal
56	Taking Smart Risks	Evaluates tradeoffs between potential costs and benefits and acts accordingly.	Intrapersonal
57	Team Building	Assembles productive groups based upon required skills, goals and tasks.	Leadership
58	Teamwork	Collaborates with others to achieve goals.	Interpersonal
59	Time Management	Plans and prioritizes work to maximize efficiency and minimize downtime.	Intrapersonal
60	Verbal Communication	Expresses ideas and opinions effectively in spoken conversations.	Interpersonal
61	Working Hard	Consistently strives to complete tasks and assignments at work.	Intrapersonal
62	Written Communication	Expresses ideas and opinions effectively in writing.	Business