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## Synthetic Validity



## Introduction

J. Hogan, Davies, and R. Hogan (2007) outline the process Hogan uses for synthetic validity. Synthetic validation involves (a) identifying the important performance components, (b) reviewing prior research on the prediction of each component, and (c) aggregating correlations across multiple studies for each component (Scherbaum, 2005). The following describes the synthetic validation process used for the Engaging Leader Report in more detail.

## Synthetic Validity

Mossholder and Arvey (1984) 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 performance components, we can review prior criterion-related studies predicting those components. We can then “synthesize” the valid predictors of the key components into an assessment battery (Balma, 1959; Lawshe, 1952). Brannick and Levine (2002) point out that synthetic validity allows us to build validity evidence from small samples with common performance components. Furthermore, 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. Although not popular at its inception, synthetic validity research has become increasingly studied (e.g., Hoffman, Holden, & Gale, 2000; Jeanneret & Strong, 2003; Johnson, Carter, Davison, & Oliver, 2001; Johnson et al., 2010; McCloy, 1994, 2001; Scherbaum, 2005).

Using data in the Hogan archive, the Hogan Research Division developed and maintains synthetic validity tables that show relationships between assessment results and each competency in the Hogan Competency Model (HCM; Hogan Assessment Systems, 2009). These results represent relationships between predictor scores and competency performance across organizations, industries, and jobs. The most recent update to this table occurred during the summer and fall of 2009 when the Hogan Research Division mapped performance results from thousands of criteria measures collected from over 250 jobs onto the HCM competencies. The Hogan Research Division then conducted a series of meta-analyses (see Hunter & Schmidt, 2004) to combine results across studies.

Meta-analysis is a statistical method used to average findings from multiple studies examining relationships between similar variables to estimate this relationship across jobs and organizations. Meta-analysis controls for error due to sampling, measurement, range restriction, and potential moderating variables (Smith & Glass, 1977). Hogan followed procedures described by (a) Hunter and Schmidt (2004) for correcting range restriction, (b) Barrick and Mount (1991) for criterion unreliability, and (c) Viswesvaran, Ones, and Schmidt (1996) for the mean inter-rater reliability coefficient. In addition, we reverse coded negatively oriented criterion variables to ensure that validity coefficients were consistently interpreted. Hunter and Schmidt (2004) argue that samples should contribute the same number of correlations to meta-analysis results to avoid bias. Thus, Hogan selected one criterion variable per competency per study, ensuring each sample contributed only one point estimate per predictor scale. These meta-analyses provide stable estimates of the relationships between results on both the Hogan Personality Inventory (HPI) and Hogan Development Survey (HDS) and performance ratings aligned with the HCM competencies.

When developing the Engaging Leader Report, we used synthetic validation research to identify the best HPI and HDS predictors of the Hogan competencies that were aligned with the Dynamic Alignment Model. Synthetic validity research yields the most specific validity generalizability evidence. Mossholder and Arvey (1984) noted that, whereas traditional uses of meta-analysis rely 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 that comprehensively represent the criterion space.

### Validity of the HPI and HDS for predicting the Dynamic Alignment Model

Foster, Lemming, and Johnson (2010) mapped each of the criteria from over 250 criterion-related validity studies in the Hogan archive onto the HCM and conducted a meta-analysis for each scale-by-competency relationship. These meta-analyses provide stable estimates of the relationships between the 7 HPI scales, the 11 HDS scales, and the competencies that compose the HCM. They report operational validities, which they corrected for sampling error, unreliability in the criterion measure, and range restriction. Tables 1 and 2 present this information.

Table 1 HPI Correlations with Dynamic Alignment Model Facets

Dynamic Alignment Model	K	N	ADJ	AMB	SOC	INP	PRU	INQ	LRN
<b>Architect</b>									
<i>Inspires with Vision</i>									
Clarifies Strategy	11	1,491	.20*	.38*	.04	.11*	.11*	.01	.09*
Inspires Performance	21	1,845	.11*	.25*	.02	.13*	.11*	-.01	.00
Communicates Vision	64	6,171	.17*	.21*	.03	.11*	.12*	.06*	.10*
<i>Sets Effective Plans</i>									
Establishes Plans	44	4,966	.12*	.11*	-.05	.03	.19*	-.05	.03
Alignment	30	3,339	.14*	.41*	.14*	.10*	.10*	.12*	.08*
Prioritizes	9	633	.18*	.06	.06	.11	.14*	-.02	.22*
<i>Brings People Along</i>									
Involves People	65	7,310	.19*	.10*	.00	.16*	.16*	-.02	.01
Clarifies Future	11	1,491	.20*	.38*	.04	.11*	.11*	.01	.09*
Communicates Clearly	64	6,171	.17*	.21*	.03	.11*	.12*	.06*	.10*
<i>Clear Goals &amp; Vision</i>									
Clear Sense of Direction	24	2,027	.15*	.23*	.04	.06	.08	.09*	.00
Work is Well Organized	44	4,966	.12*	.11*	-.05	.03	.19*	-.05	.03
Clear About Responsibility	6	1,110	.17	.25*	.10	.19*	.03	.01	.04
<b>Enable</b>									
<i>Drives Performance</i>									
Sets Expectations	14	1,189	.08	.28*	.08	.12*	.12*	.05	.10*
Removes Obstacles	27	2,505	.09*	.18*	-.02	.06	.09*	.01	.01
Ensures Accountability	43	4,422	.17*	.07	-.06*	.08*	.16*	-.02	-.01
<i>Empowers Others</i>									
Delegates	6	1,110	.17	.25*	.10	.19*	.03	.01	.04
Accessible	8	683	.11*	.22*	.15	.22*	.04	.04	-.01
Makes Decisions	28	3,474	.15*	.19*	.00	.06*	.10*	.06*	.11*
<i>Builds Bridges</i>									
Spans Boundaries	8	683	.11*	.22*	.15	.22*	.04	.04	-.01
Builds Relationships	31	3,326	.14*	.07*	.00	.15*	.14*	-.04	-.01
Manages Conflict	18	1,858	.21*	.15*	-.01	.10*	.11*	.02	.03

Table 1 HPI Correlations with Dynamic Alignment Model Facets (continued)

Dynamic Alignment Model	K	N	ADJ	AMB	SOC	INP	PRU	INQ	LRN
<i>Performance Enablement</i>									
Sufficient Information	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Decisions Without Delay	28	3,474	.15*	.19*	.00	.06*	.10*	.06*	.11*
Regular Discussions	14	1,189	.08	.28*	.08	.12*	.12*	.05	.10*
<b>Unlock</b>									
<i>Inspires Achievement</i>									
Supports Development	33	3,440	.05	.26*	.07*	.05	.04	.05*	.00
Coaching	33	3,440	.05	.26*	.07*	.05	.04	.05*	.00
Provides Recognition	7	648	-.08	.16	.16*	.21*	-.03	.02	.00
<i>Promotes Camaraderie</i>									
Teamwork	65	7,310	.19*	.10*	.00	.16*	.16*	-.02	.01
Belonging	26	2,814	.22*	.07	-.02	.14*	.20*	.01	.00
Celebrates Successes	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
<i>Ensures Equity &amp; Fairness</i>									
Respectful Treatment	41	4,490	.23*	.15*	.00	.13*	.18*	-.02	.02
Sensitive to Work/Life Balance	26	2,814	.22*	.07	-.02	.14*	.20*	.01	.00
Fair Treatment	9	897	.27*	.07	.03	.23*	.15*	.07	.08*
<i>Positive Team Climate</i>									
Receive Feedback	14	1,189	.08	.28*	.08	.12*	.12*	.05	.10*
Team Work Together	65	7,310	.19*	.10*	.00	.16*	.16*	-.02	.01
Reasonable Work/Life Balance	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Table 1 HPI Correlations with Dynamic Alignment Model Facets (continued)

Dynamic Alignment Model	K	N	ADJ	AMB	SOC	INP	PRU	INQ	LRN
<b>Elevate</b>									
<i>Inspires Innovation</i>									
Listens	31	3,109	.20*	.04	-.09*	.14*	.19*	-.04	-.02
Acts on Feedback	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Values Different Perspectives	9	897	.27*	.07	.03	.23*	.15*	.07	.08*
<i>Lives the Values</i>									
Lives Values	41	4,490	.23*	.15*	.00	.13*	.18*	-.02	.02
Demonstrate Integrity	36	3,774	.21*	.05	-.04	.14*	.25*	-.02	.02
Trustable	36	3,774	.21*	.05	-.04	.14*	.25*	-.02	.02
<i>Raises the Bar</i>									
Challenges	33	3,440	.05	.26*	.07*	.05	.04	.05*	.00
Gives Feedback	14	1,189	.08	.28*	.08	.12*	.12*	.05	.10*
Promotes Change	8	789	.04	.26	.17*	.17*	.03	.01	.07
<i>Agile &amp; Open Culture</i>									
Value Diverse Perspectives	9	897	.27*	.07	.03	.23*	.15*	.07	.08*
Exhibits Flexibility	52	5,391	.18*	.16*	.06*	.12*	.08*	.08*	.05*
Freedom to Speak	18	2,134	.20*	.42*	.21*	.08*	.01	.16*	.09*

Note. Results presented in the table are operational validities; 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; N/A = information unavailable.

Table 2 HDS Correlations with Dynamic Alignment Model Facets

Dynamic Alignment Model	K	N	EXC	SKE	CAU	RES	LEI	BOL	MIS	COL	IMA	DIL	DUT
<b>Architect</b>													
<i>Inspires with Vision</i>													
Clarifies Strategy	6	661	-.09	-.15*	-.08	-.11	-.07	.04	.04	.12	-.04	-.10	-.01
Inspires Performance	6	478	-.13	-.09	-.10	-.06	-.10	.04	.10	.14*	-.01	-.07	-.01
Communicates Vision	11	1,004	-.17*	-.15*	-.17*	-.25*	-.04	.04	-.06	.09	-.08	-.07	-.03
<i>Sets Effective Plans</i>													
Establishes Plans	5	328	-.13	-.01	.02	.04	-.05	-.04	-.07	-.13	-.15	.16*	-.04
Alignment	6	404	-.12	-.25*	-.19*	-.07	-.21*	-.07	-.02	.07	-.14*	-.10	-.09
Prioritizes	4	228	-.09*	-.07	.05	.06	-.09	.01	.10	.02	-.14*	-.03	-.10
<i>Brings People Along</i>													
Involves People	5	339	-.25*	-.21*	-.07	-.02	-.08	-.30*	-.07	-.06	-.14*	-.21*	.04
Clarifies Future	6	661	-.09	-.15*	-.08	-.11	-.07	.04	.04	.12	-.04	-.10	-.01
Communicates Clearly	11	1,004	-.17*	-.15*	-.17*	-.25*	-.04	.04	-.06	.09	-.08	-.07	-.03
<i>Clear Goals &amp; Vision</i>													
Clear Sense of Direction	5	523	-.23*	-.19*	-.08	-.16*	-.04	-.12	-.10	.05	-.12	.05	-.07
Work is Well Organized	5	328	-.13	-.01	.02	.04	-.05	-.04	-.07	-.13	-.15	.16*	-.04
Clear about Responsibility	5	811	-.09*	.01	-.19*	-.16	-.06*	.11	.06	.15	.13	-.09*	-.08
<b>Enable</b>													
<i>Drives Performance</i>													
Sets Expectations	3	467	-.18*	-.12*	-.26*	-.26*	-.11*	.19*	.04	.18*	.11	.07*	-.04
Removes Obstacles	5	636	-.08	-.2*	-.06	.02	.06	.02	-.04	.11*	-.02	.21*	.06
Ensures Accountability	7	682	-.11	-.10*	-.02	.00	-.03	-.02	-.01	.02	-.05	-.01	-.02
<i>Empowers Others</i>													
Delegates	5	811	-.09*	.01	-.19*	-.16	-.06*	.11	.06	.15	.13	-.09*	-.08
Accessible	1	25	-.27	.28	.21	-.37	.15	.20	-.18	-.43	.02	.40	.20
Makes Decisions	6	379	-.20*	-.25*	-.08	-.14*	-.21*	-.13	-.19*	-.13	-.18*	.01	-.04

Table 2 HDS Correlations with Dynamic Alignment Model Facets (continued)

Dynamic Alignment Model	K	N	EXC	SKE	CAU	RES	LEI	BOL	MIS	COL	IMA	DIL	DUT
<i>Builds Bridges</i>													
Spans Boundaries	1	25	-.27	.28	.21	-.37	.15	.20	-.18	-.43	.02	.40	.20
Builds Relationships	6	742	-.17*	-.19*	-.13*	-.14*	-.09	.00	-.06	.13	.04	-.05	.04
Manages Conflict	3	209	.00	.02	-.02	.12	.09	.09*	.11	.06*	-.10*	.03*	.11
<i>Performance Enablement</i>													
Sufficient Information	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Decisions Without Delay	6	379	-.20*	-.25*	-.08	-.14*	-.21*	-.13	-.19*	-.13	-.18*	.01	-.04
Regular Discussions	3	467	-.18*	-.12*	-.26*	-.26*	-.11*	.19*	.04	.18*	.11	.07*	-.04
Unlock													
<i>Inspires Achievement</i>													
Supports Development	6	355	-.03	-.09	.01	-.02	-.02	-.03	-.03	.02	.02	-.12*	-.02
Coaching	6	355	-.03	-.09	.01	-.02	-.02	-.03	-.03	.02	.02	-.12*	-.02
Provides Recognition	1	24	-.13	.57	.03	.20	-.16	-.09	.12	-.35	-.28	-.10	.13
<i>Promotes Camaraderie</i>													
Teamwork	5	339	-.25*	-.21*	-.07	-.02	-.08	-.30*	-.07	-.06	-.14*	-.21*	.04
Belonging	5	219	-.18*	-.31*	-.06	-.02	-.03	-.11	-.21*	-.05	-.03	-.13	.07
Celebrates Successes	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
<i>Ensures Equity &amp; Fairness</i>													
Respectful Treatment	5	364	-.26*	-.21*	-.03	.00	-.02	-.01	.05	-.03	-.13	.01	.08
Sensitive to Work/Life Balance	5	219	-.18*	-.31*	-.06	-.02	-.03	-.11	-.21*	-.05	-.03	-.13	.07
Fair Treatment	2	70	-.24*	-.22	-.25	-.09	-.16	-.38	-.12	-.13	.06*	-.30*	-.07
<i>Positive Team Climate</i>													
Receive Feedback	3	467	-.18*	-.12*	-.26*	-.26*	-.11*	.19*	.04	.18*	.11	.07*	-.04
Team Work Together	5	339	-.25*	-.21*	-.07	-.02	-.08	-.30*	-.07	-.06	-.14*	-.21*	.04
Reasonable Work/Life Balance	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A



Table 2 HDS Correlations with Dynamic Alignment Model Facets (continued)

Dynamic Alignment Model	<i>K</i>	<i>N</i>	EXC	SKE	CAU	RES	LEI	BOL	MIS	COL	IMA	DIL	DUT
<i>Elevate</i>													
<i>Inspires Innovation</i>													
Listens	4	184	-.30*	-.20*	-.07	-.18	.16	.10	-.03	-.01	-.03	.07	.03
Acts on Feedback	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Values Different Perspectives	2	70	-.24*	-.22	-.25	-.09	-.16	-.38	-.12	-.13	.06*	-.30*	-.07
<i>Lives the Values</i>													
Lives Values	5	364	-.26*	-.21*	-.03	.00	-.02	-.01	.05	-.03	-.13	.01	.08
Demonstrate Integrity	8	395	.03	-.08	-.01	.06	-.02	-.17*	-.28*	-.18*	-.13	.06	.12
Trustable	8	395	.03	-.08	-.01	.06	-.02	-.17*	-.28*	-.18*	-.13	.06	.12
<i>Raises the Bar</i>													
Challenges	6	355	-.03	-.09	.01	-.02	-.02	-.03	-.03	.02	.02	-.12*	-.02
Gives Feedback	3	467	-.18*	-.12*	-.26*	-.26*	-.11*	.19*	.04	.18*	.11	.07*	-.04
Promotes Change	3	488	-.06	-.03	-.25*	-.27*	.03	.18*	.02*	.19*	.11	-.05	.03
<i>Agile &amp; Open Culture</i>													
Value Diverse Perspectives	2	70	-.24*	-.22	-.25	-.09	-.16	-.38	-.12	-.13	.06*	-.30*	-.07
Exhibits Flexibility	6	719	-.16*	-.19*	-.19*	-.12	-.09*	.03	.08	.11	.00	-.04	.00
Freedom to Speak	2	118	-.57*	-.31	-.06	-.19	-.08	-.10	.04	.18	-.21*	-.42	-.22

*Note.* Results presented in the table are operational validities; *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; N/A = information unavailable.

## References

- Balma, M. J. (1959). The development of processes for indirect or synthetic validity. *Personnel Psychology, 12*, 395-396.
- Barrick, M. R., & Mount, M. K. (1991). The Big Five personality dimensions and job performance: A meta-analysis. *Personnel Psychology, 44*, 1-26.
- Brannick, M. T., & Levine, E. L. (2002). Doing a job analysis study. In *Job analysis: Methods, research, and applications for human resource management in the new millennium* (pp. 265-294). Thousand Oaks, CA: Sage.
- Foster, J., Lemming, M., & Johnson, A. (2010). *Validity of the Hogan Personality Inventory for competencies and job family profiles*. Tulsa, OK: Hogan Press.
- Hoffman, C. C., Holden, L. M., & Gale, E. (2000). So many jobs, so little "n": Applying expanded validation models to support generalization of cognitive ability. *Personnel Psychology, 53*, 955-991.
- Hogan Assessment Systems. (2009). *The development of the Hogan Competency Model*. Tulsa, OK: Hogan Press.
- Hogan, J., Davies, S., & Hogan, R. (2007). Generalizing personality-based validity evidence. In S. M. McPhail (Ed.), *Alternative validation strategies* (pp. 181-229). San Francisco, CA: Jossey-Bass.
- Hunter, J. E., & Schmidt, F. L. (2004). *Methods of meta-analysis: correcting error and bias in research findings*. Thousand Oaks, CA: Sage Publications.
- Jeanneret, P. R., & Strong, M. H. (2003). Linking O\*NET job analysis information to job requirement predictors: An O\*NET application. *Personnel Psychology, 56*, 465-492.
- Johnson, J. W., & Carter, G. W. (2010). Validating synthetic validation: Comparing traditional and synthetic validity coefficients. *Personnel Psychology, 63*, 755-795.
- Johnson, J. W., Carter, G. W., Davison, H. K., & Oliver, D. H. (2001). A synthetic validity approach to testing differential prediction hypotheses. *Journal of Applied Psychology, 86*, 774-780.
- Johnson, J., Steel, P., Scherbaum, C. A., Hoffman, C. C., Jeanneret, P. R., & Foster, J. (2010). Validation is like motor oil: Synthetic is better. *Industrial and Organizational Psychology: Perspectives on Science and Practice, 3*, 305-328.
- Lawshe, C. H. (1952). What can industrial psychology do for small business? (A symposium). *Personnel Psychology, 5*, 31-34.
- McCloy, R. A. (1994). Predicting job performance scores without performance data. In B. F. Green & A. S. Mavor (Eds.), *Modeling cost and performance for military enlistment: Report of a workshop*. Washington, DC: National Academy Press.

McCloy, R. A. (2001, April). *Predicting job performance scores in jobs lacking criterion data*. In J. Johnson & G. Carter (Chairs), *Advances in the application of synthetic validity*. Symposium conducted at the 16th Annual Conference of the Society for Industrial and Organizational Psychology, San Diego, CA.

Mossholder, K. W., & Arvey, R. D. (1984). Synthetic validity: A conceptual and comparative review. *Journal of Applied Psychology, 69*, 322-333.

Scherbaum, C. A. (2005). Synthetic validity: Past, present, and future. *Personnel Psychology, 58*, 481-515.

Smith, M. L., & Glass, G. V. (1977). Meta-analysis of psychotherapy outcome studies. *American Psychologist, 32*, 752-760.

Viswesvaran, C., Ones, D., & Schmidt, F. L. (1996). Comparative analysis of the reliability of job performance ratings. *Journal of Applied Psychology, 81*, 557-574.