Feedback that fuels success.™

Normative Comparison and Reliability Analyses for the Leadership Navigator® for Individual Contributors
Technical Report # 8344

3D Group

NORMATIVE COMPARISON AND RELIABILITY ANALYSES FOR THE LEADERSHIP NAVIGATOR® FOR INDIVIDUAL CONTRIBUTORS

Background

The Leadership Navigator® for Individual Contributors survey is a 360 degree feedback tool designed to assess individual contributor performance on eight critical leadership competencies.

The Individual Contributor survey relies on a two-factor approach to leadership, based on the comprehensive Ohio State Leadership studies. This framework separates leadership behavior into two primary factors: 1) Initiating Structure "Organizational Leadership", and 2) Consideration "Interpersonal". The eight Individual Contributor competencies used in the Leadership Navigator® for Individual Contributors Survey are separated into Organizational Leadership competencies and Interpersonal competencies. Initiating structure or "Organizational Leadership" focuses on accomplishing tasks and organizational priorities. Consideration or "Interpersonal" focuses on working effectively with others. Research has shown that both dimensions are important for effective performance and leadership development (Judge, Piccolo, & Ilies, 2004).

Table 1 provides an overview of each competency included in the Leadership Navigator® for Individual Contributors Survey as well as which of the two broad dimensions it falls under.

Table 1: Leadership Navigator® for Individual Contributors Competency Model

Organizational Leadership	Interpersonal
Understands the Business	Development
Planning & Organizing	Inclusiveness
Customer Orientation	Integrity
	Teamwork
	Communication Skills

The current study was undertaken to:

- Present the 2014 norms
- Discuss normative comparisons
- Reassess the reliability of the eight competencies

Normative Comparisons

Procedure

Survey responses used for this study were collected from 2005 to 2014 and administered over the internet via 3D Group's proprietary Survey Management System (SMS). Demographic data was collected from most participants and included full name, company, job title, and gender. The eight competencies of the Leadership Navigator® for Individual Contributors Survey are measured using a 5-point Likert-type "Frequency" rating scale where 1-point is "Never" and 5-point is "Always".

2014 National Sample Participant Characteristics

The dataset included survey responses by raters for participants. Individual Contributors refer to the individuals who received the feedback. Raters refer to those individuals who completed the surveys. The final dataset used to generate the 2014 Individual Contributor Survey Norms statistics included 2,272

surveys rating 259 Individual Contributors. These surveys included 259 self-surveys, 440 boss surveys, 1,414 peer surveys, and 159 other surveys (e.g., other bosses, external vendors, customers, etc). Fifty-nine percent of the Individual Contributors rated in the current norm sample were male and 41% were female. Job title data was obtained for 151 of the Individual Contributors. Sixty-five percent held Non-management/Professional positions, 26% held Supervisor/Line Manager positions, 7% held Middle-management roles (e.g., Director-level), and 2% held Executive positions (e.g., VP).

The current norm sample included data from 28 companies spanning over 13 industries. The industries most widely represented by the current sample were Retail (18%), Consulting (17%), Financial Services and Insurance (15%), and Transportation (14%) as illustrated in Table 2. It is important to note the wide range of industries represented and that no single industry was overrepresented in the sample.

Table 2. Industry Representation for 2014 National Norms Sample

Industry	% of 2014 National Sample
Retail	18%
Consulting	17%
Financial Services & Insurance	15%
Transportation	14%
NGO/Non-profit	10%
Government	10%
Higher Education	5%
Healthcare and Biotech	3%
Energy & Utilities	3%
Service Industry	2%
Technology & Software	1%
Real Estate/ Construction	1%
Manufacturing	1%

Descriptive Statistics

The descriptive statistics for the Individual Contributor Norm Sample can be found in Table 3. The range across competencies for each statistic follows: Minimum = 2.31 to 3.05, Maximum = 4.84 to 5.00, and Standard Deviation = .33 to .50.

Skewness provides a measure of the extent that a distribution of values deviates around the mean (i.e., lack of symmetry). A skewness value of zero represents perfect symmetry, and positive skewness values represent a greater number of smaller values, whereas negative skewness values represent a greater number of larger values. A skewness between +1 and -1 is considered excellent for most psychometric purposes. The skewness statistics for the current sample range from -0.80 to -1.10, and overall reflects an acceptable distribution skewed slightly with positive scores. Self Development, Customer Orientation,

and Planning & Organizing in particular appear to be more highly skewed by positive ratings as their values slightly exceed the -1.0 threshold.

Kurtosis is a measure of whether the data are peaked or flat relative to a normal distribution. A kurtosis value of zero indicates a normal distribution, and positive kurtosis values indicate a shape more peaked than normal, whereas negative kurtosis values indicate a shape more flat than normal. A kurtosis between +1 and -1 is considered excellent for most psychometric purposes. The kurtosis statistics for the current sample range from 0.37 to 2.39. While the kurtosis statistics for the competencies Self Development, Customer Orientation, and Planning & Organizing are not ideal, the remaining five competencies were excellent. The skewness statistics for these three competencies also support that they were more greatly impacted by positive ratings than the other five competencies. Overall though, skewness statistics were in the acceptable range and it is common to find 360 degree feedback data that is skewed with positive scores/ratings.

Table 3. Descriptive Statistics for Individual Contributor Norm Sample

Competencies	Min.	Max.	Mean	Std. Deviation	Skewness	Kurtosis
Understand the Business	2.67	4.95	4.25	0.37	-0.800	1.12
Self Development	2.33	4.90	4.16	0.39	-1.10	2.39
Planning & Organizing	2.31	4.97	4.19	0.43	-1.02	1.67
Customer Orientation	2.47	5.00	4.24	0.41	-1.02	1.82
Inclusiveness	2.92	5.00	4.27	0.43	-0.90	0.37
Integrity	3.05	4.92	4.29	0.33	-0.84	0.87
Teamwork	2.53	4.94	4.11	0.50	-0.90	0.42
Communication Skills	2.83	4.84	4.20	0.37	-0.83	0.59

Demographic Comparisons

When addressing the appropriateness of a comparison norm, one criterion by which to judge the quality of the norm is to understand the extent to which norms differ based on membership in key demographic groups (e.g., gender, job level). Therefore, analyses were conducted to determine the extent to which Individual Contributor competency scores differed among two key demographic groups: gender and job level. Results and conclusions derived from analyses of this data are presented in the subsequent sections.

Gender Comparisons
Gender was selected as a variable to consider for analysis because across several studies, differences in performance ratings with respect to gender are either small or inconsistent (Landy & Farr, 1982; Lovell, et. al, 1999; Shore and Tashchian, 2003; Varma & Stroh, 2001). Therefore, for a single norm to be used with both males and females, the competency norms should accurately assess the normative scores for both genders. An analysis was conducted using available demographic information to determine the extent to which mean differences existed between men and women with regards to the Individual Contributor competencies. For those participants who do not voluntarily provide gender data, gender was determined based on an assessment of the first name.

Results
Cohen's d was used to gauge the extent to which gender was responsible for differences in competency means. Commonly referred to as effect size, Cohen's d represents the proportion of variance in a distribution that is attributable to group membership. Thus, higher effect sizes indicate greater importance of group membership (i.e., that groups differ with regards to the attribute under consideration). A Cohen's d greater than .80 is considered a large effect, corresponding to an r=.371, this means that over 13.8% of variability in scores can be attributed to group membership (square of r =.371 is .138). A Cohen d of .5 is considered a moderate effect, corresponding to an r =.243, this means about 6% (.059)

of variability in scores can be attributed to group membership. A Cohen d value around .2 is considered a small effect corresponding to an r=.100, this means about 1% (.010) of variability in scores can be attributed to group membership (Cohen, 1988). In this case that would indicate there is a small difference between groups on that competency.

Table 4 displays the competency means for women and men and the effect size attributed to gender for each competency. As the table indicates, all effect sizes were considered small as Cohen d's ranged from .03 to .25. The largest differences found between genders were for the competencies Understands the Business and Self Development with men receiving slightly higher ratings across both competencies. A review of their effect sizes (.25 and .24 respectively) indicate that these difference are small.

Together these analyses provide support for the appropriateness of this survey for use with both male and female individual contributors.

Table 4. Mean Differences and Effect Sizes for Gender Across Competencies

Competency	Gender	Mean	SD	Mean Difference	Effect Size (Cohen's d)
Understands the Business	Women	4.19	0.39	.10	.25
	Men	4.29	0.35		
Self Development	Women	4.11	0.43	.09	.24
	Men	4.20	0.37		
Inclusiveness	Women	4.26	0.48	.02	.05
	Men	4.28	0.39		
Integrity	Women	4.33	0.32	.07	.20
	Men	4.26	0.34		
Planning & Organizing	Women	4.20	0.44	.02	.05
	Men	4.18	0.42		
Customer Orientation	Women	4.26	0.43	.04	.10
	Men	4.22	0.40		
Teamwork	Women	4.10	0.54	.02	.03
	Men	4.12	0.48		
Communication Skills	Women	4.19	0.38	.02	.05
	Men	4.21	0.36		

Job Level Comparisons

Job level was determined by reviewing the job title provided by the Individual Contributors. As mentioned previously, job title data was obtained for 151 of the Individual Contributors. Sixty-five percent held Non-

management/Professional positions, 26% held Supervisor/Line Manager positions, 7% held Middle-management roles (e.g., Director-level), and 2% held Executive positions (e.g., VP). For the following analysis, the Executive participants were removed because the sample only included a total of three (2%) Executive-level participants.

Results

The eta^2 statistic was used to gauge the extent to which job level was responsible for differences in competency means. Commonly referred to as effect size, eta^2 represents the proportion of variance in a distribution that is attributable to group membership. Thus, higher effect sizes indicate greater importance of group membership (i.e., that groups differ with regards to the attribute under consideration). An eta^2 value greater than .15 is considered a large effect, meaning that over 15% of variability in scores can be attributed to group membership. An effect size around .10 is considered a moderate effect, meaning between about 10% of variability in scores can be attributed to group membership. An eta^2 value between around .05 is considered a weak effect (Jaccard & Becker, 1997). In this case that would indicate there is a small difference between groups on that competency.

Effect sizes were computed to gauge the extent to which job level accounted for the variance in scores. Table 5 displays the competency means for Non-managers, Supervisors, and Mid-level Managers, the effect size attributed to job level for each competency, and the significance of the differences in mean scores between the three groups. As Table 5 indicates, job level explained between 1% and 4% of the variance in scores, which is a small effect. To further examine if job level differences in competency scores were significant, a multivariate analysis of variance test (MANOVA) was conducted across the eight competencies. No significant mean differences were found across all eight competencies between the Non-managers, Supervisors, and Mid-level Manager participants. Together these analyses support the appropriateness of the Individual Contributor Survey for use across these varying job levels in our sample.

Table 5. Mean Differences and Effect Sizes for Job Level Across Competencies

Competency	Job Level	Mean	Effect Size (eta^2)	Significance
Understands the Business	Non-Mgmt	4.31	.038	.114
	Supervisor	4.16		
	Mid-Mgmt	4.17		
Self Development	Non-Mgmt	4.18	.006	.817
	Supervisor	4.14		
	Mid-Mgmt	4.12		
Inclusiveness	Non-Mgmt	4.24	.006	.808
	Supervisor	4.29		
	Mid-Mgmt	4.16		
Integrity	Non-Mgmt	4.26	.015	.515
	Supervisor	4.34		
	Mid-Mgmt	4.20		
Planning & Organization	Non-Mgmt	4.20	.012	.586
	Supervisor	4.24		
	Mid-Mgmt	4.04		
Customer Orientation	Non-Mgmt	4.22	.023	.311
	Supervisor	4.26		
	Mid-Mgmt	4.01		
Teamwork	Non-Mgmt	4.11	.025	.265
	Supervisor	4.15		
	Mid-Mgmt	3.84		
Communication Skills	Non-Mgmt	4.21	.010	.679
	Supervisor	4.19		
	Mid-Mgmt	4.10		

Leadership Navigator® for Individual Contributor 2014 National Norms

Norms, or average ratings for Individual Contributors, provide a useful reference point for individuals processing their feedback reports. Analysis of responses began by computing the mean (average) and standard deviation of ratings for each survey item (survey question) across all raters (excluding self ratings) for a particular Individual Contributor. This Individual Contributor mean was then used to calculate the 2014 National Norm item mean for each survey item by taking the average of all Individual Contributors' means for that item. The 2014 National Norm competency means were calculated by averaging all items within each competency for each Individual Contributor. The Individual Contributors' competency means were then averaged to identify the overall competency norms. In addition, 20th and 90th percentile scores were computed for use as helpful points of reference to be included in Leadership Navigator® for Individual Contributors Survey feedback reports. The percentile score results are not presented in this report. Table 6 contains the normative averages for each Individual Contributor Competency for 2014.

Table 6. 2014 Normative Averages for Individual Contributor Competencies

Competency	2014 Norm
Understand the Business	4.25
Self Development	4.16
Planning & Organizing	4.19
Customer Orientation	4.24
Inclusiveness	4.27
Integrity	4.29
Teamwork	4.11
Communication Skills	4.20

Reliability Analysis of Competency Scales

Reliability refers to the consistency of measurement of an assessment. Reliability can be described using the analogy of the clock. A clock is reliable to the extent that it maintains time. Thus, a clock may be two hours fast (not valid) but if it is always too hours fast, it is reliable. If the clock is sometimes two hours fast, sometimes 10 minutes behind, and occasionally an hour slow, it is not reliable or valid (and not much use for telling time).

In most circumstances, competency scales comprised of several individual behavior items are more reliable than single items. Competency ratings provide an indication of the leader's level of performance on a group of related, yet multi-faceted skills. For example, for a leader to understand his or her skill at communicating with colleagues, it is necessary to understand perceptions of speaking clearly and listening attentively, among other behaviors. Without knowing the nuances of communication, it is difficult for a leader to improve this skill. Therefore, it is necessary to collect ratings on each individual area of the communication competency in order to understand where specific skill gaps exist.

Reliability analyses of the ratings for this study were conducted using Cronbach's Alpha estimate of internal consistency. This estimate provides an index of the average inter-item correlation for the items of a competency. It is the most widely used index of reliability for assessment tools. Cronbach's Alpha estimates range from 0 to 1.0, with an estimate of at least .70 indicating acceptable levels of reliability for this type of assessment. Therefore, when the Alpha estimate is higher than .70, items within a competency are consistent with one another and are likely tapping into a common workplace characteristic. Reliability estimates are displayed along the diagonal in Table 7 below.

Table 6. Cronbach's Reliability Estimates and Competency Intercorrelations for 2014 Norms

Competency	1	2	3	4	5	6	7	8
1. Understand the Business	*.88*							
2. Self Development	0.78	*.83*						
3. Planning & Organizing	0.74	0.73	*.91*					
4. Customer Orientation	0.68	0.76	0.78	*.87*				
5. Inclusiveness	0.52	0.76	0.54	0.68	*.88*			
6. Integrity	0.63	0.78	0.76	0.75	0.76	*.77*		
7. Teamwork	0.60	0.80	0.63	0.76	0.90	0.77	*.89*	
8. Communication Skills	0.71	0.80	0.74	0.74	0.80	0.78	0.83	*.81*

Note: N=259. Values along the diagonal, in **bold italics**, represent Cronbach's Alpha for the 2014 norms. Correlations below the diagonal, represent the intercorrelations for the current study. All correlations were significant ($p < .01$).

As evidenced by Cronbach's Alpha, reliabilities were found to be within acceptable levels ranging from .77 to .91. Finally an examination of the competency intercorrelations reveals acceptable strengths of relationships between competencies. Because all competencies are measuring work performance we would expect moderate relationships between competencies, though relationships exceeding .90 would be worrisome. Competency intercorrelations ranged from .52 to .90, with the average correlation being .73. All correlations were statistically significant ($p<.01$). The strong intercorrelation (.90) between Teamwork and Inclusiveness makes sense as individuals perceived to be strong team members are also very likely to be perceived as exhibiting high levels of inclusive behaviors. Overall, the 2014 National Norms for the Individual Contributor survey exceeded acceptable reliability levels.

References

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Hillsdale, NJ: Lawrence Earlbaum Associates.

Jaccard, J. & Becker, M.A. (1997). *Statistics for the Behavioral Sciences.* Pacific Grove, CA: Brooks/Cole Publishing Company.

Judge, T.A., Piccolo, R.F., & Ilies, R. (2004). The Forgotten Ones? The Validity of Consideration and Initiating Structure in Leadership Research. *Journal of Applied Psychology*, 89, 36 - 51.

Landy, F.J., & Farr, J.L. (1982). Performance Rating. *Psychological Bulletin*, 87, 72-107.

Lovell, S.E., Kahn, A.S., Anton, J., Davidson, A., Dowling, E., Post, D., & Mason, C. (1999). Does Gender Affect the Link Between Organizational Citizenship Behavior and Performance Evaluation? *Gender Roles*, 41, 469-478.

Shore, T.H., & Tashchian, A. (2003). Effects of Gender on Raters' Accountability. *Psychological Reports*, 92(2), 693-702.

Varma, A., & Stroh, L.K. (2001). The Impact of Same-Gender Dyads on Performance Evaluations. *Human Resource Management*, 40, 309-320.

Note: In referencing this report, please use the following reference:

English, A. (2014). *Normative Comparison and Reliability Analyses for the Leadership Navigator[®] for Individual Contributors.* 3D Group Technical Report #8344. Emeryville, CA: Data Driven Decisions, Inc.