

LPI DATA ANALYSIS

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The attached pages provide a psychometric update on the LPI and the conclusion is “that the LPI continues to be a reliable and valid instrument.”

In addition, breakdowns of the LPI by demographic variables are provided.

The current sample includes data collected through the LPI Online from 2005 – 2007.

Demographic information is voluntarily provided (~ 25% response rate).

STRONG PSYCHOMETRIC PROPERTIES

RELIABILITY

Reliability of the LPI was tested through analysis of internal reliability (Table 1). All five leadership practices had consistently strong internal reliability coefficients, for both the Self and Observers formats. Cronbach alpha coefficients greater than .70 are generally regarded as very good.

Table 1
Internal Reliability Coefficients (Cronbach alpha)
for the Five Practices of Exemplary Leaders

	MTW	ISV	CTP	EOA	ETH
All Respondents (N = 651,602)	.84	.91	.86	.86	.91
Self Only (N = 48,620)	.74	.88	.79	.73	.86
Observers Only (N = 602,982)	.84	.92	.86	.86	.92

VALIDITY

Analysis of validity was tested in several ways. An “impact” scale was created, using responses from Observers only. Respondents were asked 10 questions (using five-point Likert scales) regarding their feelings of and assessments about team spirit, organizational pride, behavioral commitment, motivation, productivity, clarity of expectations, levels of appreciation, effectiveness, management trust, and efficacy in the workplace. Internal reliability for the

Impact scale was 0.93. The correlations shown in Table 2 between the Impact scale and the five leadership practices were all statistically significant ($p < .001$).

Table 2
Correlations of Impact with Leadership Practices
[LPI-Observer Responses Only]

	MTW	ISV	CTP	EOA	ETH
Impact	.28	.26	.26	.27	.26

All correlations are statistically significant ($p < .001$).

Three approximately equal-sized groups were created on the Impact scale, representing weak, moderate and strong impact groupings. The data in Table 3 reveals that as constituents (observers) report greater levels of engagement by their leaders in each of The Five Practices of Exemplary Leaders that they also report feeling more strongly (favorably) impacting their workplaces. All differences between the three Impact groups were statistically significant ($p < .001$).

Table 3
Analysis of Variance on Leadership Practices by Weak, Moderate and Strong Impact Respondents

		N	Mean	Std. Deviation
Model the Way	Weak Impact	47091	42.50	9.879
	Moderate Impact	44193	46.77	7.921
	Strong Impact	58328	50.75	7.358
	Total	149612	46.97	9.068

Inspire a Shared Vision	Weak Impact	47090	39.03	11.666
	Moderate Impact	44192	43.73	9.940
	Strong Impact	58329	48.35	9.494
	Total	149611	44.05	11.060
Challenge the Process	Weak Impact	47093	40.52	10.483
	Moderate Impact	44191	44.73	8.711
	Strong Impact	58329	48.76	8.344
	Total	149613	44.98	9.798
Enable Others to Act	Weak Impact	47090	45.57	9.712
	Moderate Impact	44191	49.48	7.347
	Strong Impact	58331	52.80	6.607
	Total	149612	49.54	8.471
Encourage the Heart	Weak Impact	47089	41.21	11.594
	Moderate Impact	44192	45.89	9.622
	Strong Impact	58330	50.25	8.834
	Total	149611	46.12	10.692

Table 4 (below) reveals that as constituents (observers) report greater levels of transformational leadership (as assessed by the linear combination of their leader's frequency of engagement in The Five Practices of Exemplary Leaders) they report feeling more strongly (favorably) impacting their workplaces. Differences between the three groups were statistically significant ($p < .001$).

Table 4
Analysis of Variance on Transformational Leadership (Five Leadership Practices Combined) by Weak, Moderate and Strong Impact Respondents

Transformational Leadership

	N	Mean	Std. Deviation

Weak Impact	47087	208.8321	47.12821
Moderate Impact	44190	230.6029	37.72957
Strong Impact	58327	250.8958	35.78184
Total	149604	231.6623	43.90113

DEMOGRAPHIC VARIABLES ACCOUNT FOR LITTLE VARIANCE IN LEADERSHIP OR IMPACT

Regression analysis was used to examine whether or not variances in leadership practices could be accounted for by possible differences within respondents. The following 10 demographic variables were entered into the regression equation for each of the five leadership practices as the dependent variable (using only responses from observers/constituents): Age, country location, education, ethnicity, gender, function, hierarchical level, industry, and length of time with company, and organizational size. As Table 5 illustrates, these various demographic variables *in total* accounted for no more than 0.02 percent of the variance. In other words, little to no explained variance in leadership practices is provided by understanding various demographic variables about the respondent. Alternatively, these demographic characteristics of respondents do not explain their observations about the frequency to which their leaders engage in the Five Practices of Exemplary Leaders.

Table 5
Regression Analysis of Leadership Practices
By Demographic Variables:
[LPI-Observer Responses Only]

Leadership Practice	R	R ²
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Model the Way	.104	.011
Inspire a Shared Vision	.126	.016
Challenge the Process	.092	.008
Enable Others to Act	.106	.011
Encourage the Heart	.106	.011

As Table 6 demonstrates, in fact, an explanation for why respondents (observers) feel that they are having an impact on their organizations is not explained by who they are themselves (demographically) but by the leadership practices engaged in by their leaders. Regression analysis of impact on the basis of demographic variables and leadership practices shows the overwhelmingly strong role that the latter has on how people feel in and about their workplaces.

Table 6
Regression Analysis on Impact
by Demographic Variables (10)
and Leadership Practices (5)
[LPI-Observer Responses Only]

	R	R ²
Demographic Variables (10)	.074	.005
Leadership Practices (5)	.451	.203

DESCRIPTIVE LPI DATA ACCORDING TO VARIOUS RESPONDENT CHARACTERISTICS

These next sections provide descriptive information about the leadership practices of respondents across a variety of demographic variables. The first section shows the rank order of the 30 leadership statements, from least to most frequent, for both Self and Observers. The remaining sections provide data about

SECTION 1: Rank order of LPI statements

All comparisons (t-tests) on LPI statements between SELF and OBSERVER respondents were statistically different ($p < .001$) with the exception of #5, #19 and #24.

Means and Standard Deviations (SD) for
All LPI Statements in Rank Order for
SELF (N = 46,663) and OBSERVERS (N = 603,189)

	Self Respondents		Observer Respondents	
	Mean	SD	Mean	SD
Q16 MTW	5.95	2.18	6.51	2.48
Q17 ISV	5.98	2.16	6.81	2.26
Q7 ISV	6.44	2.05	6.92	2.23
Q12 ISV	6.48	2.12	6.94	2.28
Q13 CTP	6.71	2.07	7.32	2.13
Q25 ETH	6.76	2.04	7.24	2.23
Q15 ETH	6.80	2.11	7.26	2.22
Q28 CTP	6.88	1.91	6.96	2.21
Q8 CTP	6.99	1.85	7.31	2.07
Q20 ETH	7.16	2.08	7.58	2.16
Q21 MTW	7.17	1.93	7.69	1.94
Q2 ISV	7.26	1.75	7.55	1.97
Q18 CTP	7.34	1.87	7.47	2.11
Q6 MTW	7.39	1.70	8.02	1.78
Q26 MTW	7.40	2.05	7.60	2.22
Q22 ISV	7.41	1.88	7.67	2.03
Q23 CTP	7.47	1.78	7.92	1.92
Q29 EOA	7.48	1.84	7.57	2.08
Q27 ISV	7.49	2.06	7.79	2.15

Q10	ETH	7.55	1.66	7.67	2.00
Q3	CTP	7.66	1.62	7.81	1.90
Q30	ETH	7.79	1.64	8.00	1.96
Q19	EOA	7.95	1.31	7.95	1.74
Q9	EOA	8.00	1.44	8.14	1.82
Q24	EOA	8.13	1.60	8.11	1.85
Q5	ETH	8.15	1.53	8.13	1.87
Q1	MTW	8.46	1.24	8.31	1.66
Q4	EOA	8.68	1.26	8.52	1.68
Q11	MTW	8.81	1.18	8.66	1.54
Q14	EOA	9.22	1.06	9.03	1.47

SECTION 2: Leadership Practices by Type of Respondent

All comparisons (t-tests) between Self and Observers were statistically different ($p < .001$), with Observers having Stronger average scores than Self respondents for all leadership practices except EOA.

All comparisons (t-tests) between Self and Managers, Self and Co-Workers, Self and Direct Reports, and Self and Others were statistically different ($p < .001$).

All comparisons (ANOVA) between Observers (Managers, Co-Workers, Direct Reports, and Others) were statistically different ($p < .001$). Generally, responses from Others were higher than the other three groups; Direct Reports were higher than those from Co-Workers and Managers. Responses from Co-Workers and Managers were generally not statistically different from one another.

Leadership Practices by Respondent Type
Means (Standard Deviations)

	MTW	ISV	CTP	EOA	ETH
Self (N = 48,620)	45.18 (6.92)	41.07 (9.48)	43.04 (7.73)	49.43 (5.62)	44.21 (8.60)
Observers (N = 602,982)	46.78 (8.84)	43.69 (10.86)	44.80 (9.55)	49.32 (8.22)	45.88 (10.44)
Managers (N = 78,661)	46.51 (7.87)	41.94 (10.23)	44.43 (8.63)	48.50 (7.16)	45.40 (9.32)
Co-Workers (N = 232,498)	46.42 (8.71)	42.96 (10.84)	44.47 (9.45)	48.62 (8.20)	45.31 (10.29)
Direct Reports	46.79	44.61	44.86	50.21	46.21

(N = 96,903)	(9.42)	(11.08)	(10.03)	(8.66)	(11.13)
Others (N = 94,920)	47.86 (8.61)	44.98 (10.63)	45.76 (9.44)	49.85 (7.95)	47.02 (10.10)

SECTION 3: Leadership Practices by Respondent's Hierarchical Position or Level (OBSERVERS)

All comparisons (ANOVA) between respondents by hierarchical position were statistically different ($p < .001$) for all five leadership practices.

Responses from Supervisory and Middle Management were not statistically different for any of the leadership practices.

Responses from Individual Contributors and Executive Management were not statistically different for MTW, CTP and ETH; and generally higher on average than those responses from Supervisory and Middle Management ranks.

Leadership Practices by Respondent Hierarchical Position [LPI-Observer Responses Only] Means (Standard Deviations)

	MTW	ISV	CTP	EOA	ETH
Individual Contributor (N = 36,300)	47.18 (9.21)	44.23 (11.24)	45.15 (10.00)	49.88 (8.52)	46.46 (10.81)
Supervisory Mgt (N = 38,596)	46.78 (8.71)	43.86 (10.70)	44.84 (9.38)	49.13 (8.22)	45.78 (10.32)
Middle Management (N = 32,402)	46.91 (8.76)	43.92 (10.83)	44.92 (9.50)	49.26 (8.30)	45.87 (10.41)
Executive Mgt (N = 39,568)	47.37 (9.37)	44.51 (11.34)	45.29 (10.16)	50.20 (8.60)	46.71 (11.00)

SECTION 4: Leadership Practices by Respondent's Hierarchical Position or Level (SELF)

All comparisons (ANOVA) between respondents by hierarchical position were statistically different ($p < .001$) for all five leadership practices.

Responses from Individual Contributors were different from all three levels for all five leadership practices. Supervisory and Middle Management were not statistically different for MTW, EOA, and ETH. Responses from Supervisory, Middle and Executive Management were not statistically different on EOA and ETH.

Leadership Practices by Respondent Hierarchical Position [LPI-SELF Responses Only] Means (Standard Deviations)

	MTW	ISV	CTP	EOA	ETH
Individual Contributor (N = 2,116)	43.14 (7.68)	38.42 (10.47)	42.08 (8.17)	47.86 (6.24)	42.44 (9.48)
Supervisory Mgt (N = 2,201)	45.54 (7.21)	40.86 (9.85)	42.94 (8.13)	50.31 (5.40)	45.13 (8.60)
Middle Management (N = 5,480)	45.93 (6.47)	42.46 (8.82)	44.30 (7.24)	49.95 (5.18)	44.98 (8.14)
Executive Mgt (N = 2,215)	46.70 (6.31)	44.68 (8.32)	45.46 (6.71)	50.05 (5.26)	45.48 (7.78)

Leadership Practices by Ethnicity
(U.S. only)
[LPI-Observer Responses Only]
Means (Standard Deviations)

	MTW	ISV	CTP	EOA	ETH
Asian/Pacific Islander (N = 7,215)	46.26 (9.66)	43.45 (11.50)	44.49 (10.39)	49.17 (9.09)	46.14 (10.88)
Black/African American (N = 7,567)	49.78 (9.28)	47.50 (11.04)	47.01 (10.40)	51.21 (8.69)	48.99 (10.75)
Hispanic (N = 5,765)	48.27 (9.36)	45.95 (10.96)	46.03 (10.28)	50.49 (8.56)	47.63 (10.78)
Native American (N = 1,019)	47.76 (9.36)	44.57 (11.49)	45.22 (10.27)	49.51 (8.87)	46.46 (11.21)
Other (N = 4,388)	46.67 (9.81)	44.03 (11.74)	44.63 (10.62)	48.94 (9.57)	46.09 (11.43)
White/Caucasian (N = 97,287)	47.33 (8.94)	44.36 (11.00)	45.33 (9.68)	49.84 (8.32)	46.39 (10.64)

All comparisons (ANOVA) by Ethnicity were statistically different ($p < .001$) for all five leadership practices.

Asian/Pacific Islanders were statistically different on all five leadership practices from Blacks and Hispanics, and also from Whites (except for ETH). Their responses were generally not different from Native Americans or Others.

Black/African Americans were statistically different on all five leadership practices from all other ethnic respondent categories.

Hispanics were statistically different on all five leadership practices from Asians, Blacks, Whites, Others, and also from Native Americans (except for MTW and CTP).

Native Americans were statistically different on all five leadership practices from Blacks, and also from Hispanics (except for MTW and CTP). Their responses were generally not different from Whites or Others (with the exception of MTW).

Others (presumably multi-ethnic/racial) were statically different on all five leadership practices from Blacks and Hispanics. Their responses were generally not different from Native Americans or Others (with the exception of CTP and EOA).

Whites were statistically different on all five leadership practices from Blacks and Hispanics and also from Asians (except for ETH) and Others (except for ETH). Their responses were generally not different from Native Americans.

Leadership Practices between
White Respondents and Persons of Color
(U.S. only)
[LPI-Observer Responses Only]
Means (Standard Deviations)

	MTW	ISV	CTP	EOA	ETH
White (N = 97,287)	47.33 (8.94)	44.36 (11.00)	45.33 (9.68)	49.84 (8.32)	46.39 (10.64)
Persons of Color (N = 25,954)	47.86 (9.60)	45.33 (11.43)	45.62 (10.45)	50.03 (9.00)	47.30 (11.00)

All comparisons (t-tests) between White respondents and Persons of Color were statistically different ($p < .001$) for all five leadership practices.

Explained variance (regression analysis) on IMPACT for White respondents is .212 (R^2) and for Persons of Color respondents is .240 (R^2).

**Leadership Practices by
Size of Respondent's Organization
[LPI-Observer Responses Only]
Means (Standard Deviations)**

	MTW	ISV	CTP	EOA	ETH
Very Small (< than 100 employees) (N = 28,526)	47.32 (9.45)	45.06 (11.21)	45.44 (10.14)	49.79 (8.83)	46.75 (10.91)
Small (between 100 - 499 employees) (N = 26,461)	46.83 (9.27)	44.01 (11.12)	44.76 (10.00)	49.35 (8.67)	45.95 (10.78)
Somewhat Moderate (500 - 999 employees) (N = 12,835)	46.72 (8.98)	43.73 (11.04)	44.66 (9.78)	49.35 (8.39)	45.79 (10.74)
Moderate (between 1,000-4,999 employees) (N = 25,831)	46.97 (9.05)	43.78 (11.05)	44.86 (9.79)	49.52 (8.42)	45.88 (10.74)
Large (between 5,000 - 9,999 employees) (N = 14,049)	47.03 (9.04)	43.98 (11.20)	45.00 (9.81)	49.64 (8.43)	46.24 (10.74)
Very Large (> 10,000 employees) (N = 37,461)	47.23 (8.47)	43.96 (10.70)	45.25 (9.24)	49.85 (7.92)	46.36 (10.65)

All comparisons (ANOVA) between respondents by size of their organizations (number of employees) were statistically different ($p < .001$) for all five leadership practices.

Respondents from Very Small organizations are statistically different from Small, Somewhat Moderate and Moderate sized organizations on all five leadership practices. Responses from these organizations are different from Large organizations on ISV, CTP and ETH and from Very Large organizations on ISV and ETH.

Respondents from Small organizations are statistically different from those in Very Small organizations on all five practices and different from Very Large organizations on four of the five practices (the exception being ISV). They do not differ on any of the leadership practices with their counterparts in Somewhat Moderate, Moderate and Somewhat Large organizations.

Respondents from Somewhat Moderate sized organizations statistically differ on all five leadership practices with Very Small organizations and with Very Large organizations on every leadership practice but ISV. They do not differ on any of the leadership practices with their counterparts in Somewhat Moderate, Moderate and Somewhat Large organizations.

Respondents from Moderate sized organizations statistically differ on all five leadership practices with Very Small organizations and with Very Large organizations on every leadership practice but ISV. They do not differ on any of the leadership practices with their counterparts in Somewhat Moderate, Moderate and Somewhat Large organizations.

The pattern of responses from Small, Somewhat Moderate, and Moderate sized organizations are very similar.

Respondents from Large organizations differ from their counterparts in Very Small, Small, Somewhat Moderate and Moderate sized organizations on only the leadership practices of CTP and ETH. They also differ on ISV from those in Very Small organizations and they do not differ on any leadership practice with those in Very Large organizations.

Respondents in Very Large organizations differ from their counterparts in Small, Somewhat Moderate and Moderate sized organizations on four of the leadership practices (MTW, CTP, EOA and ETH). They also differ on ISV and ETH from those in Very Small organizations and they do not differ on any leadership practice with those in Large organizations.

The pattern of responses from Large and Very Large sized organizations are very similar.

Leadership Practices by Educational Level of Respondents
[LPI-Observer Responses Only]
Means (Standard Deviations)

	MTW	ISV	CTP	EOA	ETH
Strong School (N = 6,421)	47.42 (9.59)	44.99 (11.23)	44.76 (10.47)	49.52 (9.31)	46.40 (11.17)
Some College (N = 29,253)	47.67 (9.52)	45.22 (11.28)	45.20 (10.43)	50.02 (8.89)	46.76 (11.24)
Bachelors Degree (N = 60,463)	46.87 (8.92)	43.88 (10.95)	44.88 (9.62)	49.54 (8.32)	46.01 (10.61)
Masters Degree (N = 42,545)	46.83 (8.74)	43.63 (10.88)	45.13 (9.46)	49.46 (8.18)	46.04 (10.26)
Doctoral Degree (N = 7,426)	47.62 (8.72)	44.53 (10.94)	46.05 (9.34)	50.06 (7.98)	46.85 (10.19)

All comparisons (ANOVA) between respondents by their years of education were statistically different ($p < .001$) for all five leadership practices.

Respondents with a Strong School education differed only on EOA with those who had completed some college coursework. They differed on MTW and ISV with those receiving a college or master's degree and differed with those holding a doctoral degree on CTP and EOA. They did not differ from any educational category on ETH.

Respondents who had completed Some College coursework only differed from their Strong School graduate counterparts on EOA. They also differed on EOA with Bachelor and Master's degree recipients. They differed on ISV with those who had completed their Bachelor's, Master's or Doctoral degrees, and they differed on ETH with Bachelor and Master's degree holders.

Respondents with a Bachelor's Degree differed on all five leadership practices with both those who had attended Some College and with those holding a Doctoral Degree. They differed from Strong School graduates on MTW and ISV, and with Master's Degree recipients on ISV and CTP.

Master's Degree recipients differed from their Doctoral Degree holders on all five leadership practices and on four of the leadership practices with their counterparts who

had attended Some College (the exception was CTP). They differed from Strong School graduates on MTW and ISV, and with Master's Degree recipients on ISV and CTP.

The pattern of responses from Bachelor and Master's Degree recipients was very similar.

Respondents with a Doctoral Degree differed on all five leadership practices with their counterparts who had received either a Bachelor or Master's Degree. They differed on CTP with Strong School graduates and those with Some College coursework. They also differed with the former group on EOA and with the latter group on ISV.

Leadership Practices by
Size of Respondent's Length of Time with Organization
[LPI-Observer Responses Only]
Means (Standard Deviations)

	MTW	ISV	CTP	EOA	ETH
Less than 1 year (N = 11,699)	48.30 (9.14)	46.13 (11.06)	46.22 (9.94)	51.21 (8.36)	47.79 (10.61)
1 to 3 years (N = 26,412)	47.07 (9.23)	44.54 (11.11)	45.14 (9.92)	49.97 (8.54)	46.57 (10.77)
3 to 5 years (N = 20,270)	46.85 (9.21)	44.11 (11.16)	44.96 (9.95)	49.51 (8.65)	46.16 (10.86)
5 to 10 years (N = 35,740)	46.69 (9.09)	43.65 (11.11)	44.78 (9.77)	49.38 (8.46)	45.81 (10.75)
10 years or more (N = 52,970)	47.16 (8.76)	43.88 (10.81)	45.01 (9.60)	49.35 (8.25)	46.01 (10.43)

All comparisons (ANOVA) between respondents by length of time with their organizations were statistically different ($p < .001$) for all five leadership practices.

Those with less than one year with their company were statistically different from all of the other tenure categories (Stronger) on all five leadership practices.

Those with one to three years with their company were statistically different from those with less than one year on all five leadership practices. Their responses were statistically different from those in the 3-5 category (except for MTW), 5-10 category (except for CTP) and with those in the 10+ category (except for MTW and CTP).

Those with 3-5 years were statistically different from the less than one year category on all five leadership practices and similarly different with those in the 3-5 year category (except for MTW). Those with 3-5 years were statistically different on ISV with those having 5-10 or 10+ years, and different from the 5-10 year category on ETH and with the 10+ years category on MTW.

Those with 5-10 years were statistically different on all five categories with those with less than one year with their employer, as well as different from those with 1-3 years

(except for CTP). Their responses differed from the 10+ year group on MTW and CTP as well as on ISV and ETH with those in the 3-5 year category.

Those with 10 or more years were statistically different on all five categories with those with less than one year with their employer, as well as different from those with 1-3 years (except for MTW and CTP). Their responses differed from those with 3-5 years on MTW and ETH, and on MTW and ISV with those in the 5-10 year category.

For MTW: All comparisons were statistically different with the exception of 1-3 years with 10 years or more.

For ISV: All comparisons were statistically different from one another.

For CTP: All comparisons were statistically different with the exception of 1-3 years with 3-5 years and 10 years or more; and 3-5 years with 5-10 years and 10 years or more.

For EOA: All comparisons were statistically different with the exception of 3-5 years with 5-10 years and 10 years or more.

For ETH: All comparisons were statistically different with the exception of 3-5 years with 10 years or more.

Respondents with 1-3 years were not statistically different from those with 10 years or more with their organizations on MTW and CTP; and not statistically different from those with 3-5 years on CTP.

Respondents with 3-5 years with their organizations were not statistically different from those with 5-10 years and 10 years or more on CTP, EOA and ETH.