Psychometric Properties of The Student Leadership Practices Inventory

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There continues to be considerable interest in youth and college student leadership development among secondary and tertiary institutions as well as among scholars. This is evident in the ever increasing number of courses being taught on leadership and programs incorporating a focus on leadership with students and the expanding number of studies being conducted by leadership educators and scholars.

One of the most prominent and well regarded leadership frameworks for youth leadership is The Five Practices of Extraordinary Leaders (Kouzes & Posner, 2008). This approach looks at the actual behaviors of people when they are at their personal best as leaders, and postulates five key behaviors: Modeling the Way, Inspiring a Shared Vision, Challenging the Process, Enabling Others to Act, and Encouraging the Heart. Kouzes and Posner (2007, 2011) have argued that leadership is a set of skills that can be learned, and that these skills can be acquired and engaged in by anyone.

The Leadership Practices Inventory (Kouzes & Posner, 1988) was created in order to enhance the development of leaders through feedback on their current behaviors and actions, as evidenced by themselves as well as others. The effectiveness of feedback -- especially 360-degree feedback in an organizational context from superiors, subordinates, peers, and even customers -- has been well documented. The Leadership Practices Inventory (LPI) is one of the most widely used and well-regarded leadership development instruments. In its current electronic online format it has been completed by over 1.4 million respondents around the world in just the past three-four years alone.

A student version of the LPI was created in the mid-1990s and its development, reliability and validity have been well documented (Posner & Brodsky, 1992, 1993, 1994; Posner & Rosenberger, 1997; Posner, 2004, 2009). An electronic online version of the Student Leadership Practices Inventory (Student LPI) was launched in 2007 which substantially enhanced the accessibility of the instrument to youth leaders and student leadership educators.

This manuscript updates the psychometric properties of the Student LPI (Posner, 2004). In addition, it examines the Student LPI in relationship to a set of demographic variables; ands explores the impact of leadership experience and formal leadership development opportunities on leadership practices. Finally, the relationship between engagement in the five leadership practices and leadership effectiveness is investigated. This document is primarily a descriptive report about the Student LPI. Other than verifying the reliability and validity of the Student LPI it does not test a specific set of hypotheses or provide general information on the use of the Student LPI by student leaders and student leadership development educators.

Sample Characteristics

This sample consists of respondents to the online version of the Student LPI from a two year period beginning August 2007 through August 2009. This total sample involves 38,944 respondents, with about 21 percent being "leaders" (Self respondents; N = 8,208) and 79 percent being "observers" (generally peers; N = 30,736). After completing the Student LPI, all respondents are given the option of providing demographic information about themselves, and answering a few evaluative questions. Approximately 25 percent of the total sample availed themselves of this option. There is no reason to expect a systematic difference between the characteristics of this sample and that of the total population who completes the Student LPI. Tables 1 through 5 provide descriptive information about the sample.

Table 1 shows the age distribution from respondents in both the Self and Observer category. Over one-third of the Self respondents are between the ages of 18-20 years, with just about 20 percent being 15 years of age or younger. Among Observers, the most frequent age category is 31 years or older, followed closely by 18-20 year olds and 21-23 year olds. Chi-square analysis reveals that the distributions of these two groups in terms of ages is not equivalent (chi-square = 6.50, $p < .001$).

Table 1: Age Distribution of Self and Observers

Age	Self		Observer	
	N	%	N	%
15 years and under	380	19.6	1194	15.1
16-17 years old	208	10.7	718	9.1
18-20 years old	748	38.6	1465	18.6
21-23 years old	344	17.7	1457	18.5
24-27 years old	117	6.0	577	7.3
27-30 years old	42	2.2	384	4.9
31 years and older	100	5.2	2094	26.5

Chi-square = 6.50, $p < .001$

Table 2 shows the distribution of respondents by year in school. Just over one-half of the Self respondents are in college, approximately 30 percent are in high school, 9.5 percent are college graduates and about 8 percent are graduate students. Similarly, among the Observers just over one-half are college students, about 25 percent are in high school, nearly 7 percent are college graduates and over 15 percent are in graduate school. Chi-square analysis reveals that the distributions of these two groups for year in school is not equivalent (chi-square = 5.66, $p < .001$).

Table 2: School Year Distribution of Self and Observers

School Year	Self		Observer	
	N	%	N	%
High School Frosh	95	5.1	284	4.0
HS Sophomore	190	10.2	568	8.0
HS Junior	200	10.7	671	9.4
High School Senior	75	4.0	228	3.2
College Frosh	297	15.9	426	6.0
College Sophomore	58	3.1	1472	20.6
College Junior	301	16.1	880	12.3
College Senior	327	17.5	1038	3.3
College Graduate	177	9.5	483	6.8
Grad School Student	148	7.9	1090	15.3

Chi-square = 5.66, $p < .001$

Table 3 shows the distribution of respondents by gender. Females dominant both samples, with over 62 percent among the Self respondents and almost 59 per cent among the Observer respondents. Chi-square analysis reveals that the distribution of genders for these two groups is not equivalent (chi-square = 8.86, $p < .001$).

Table 3: Gender Distribution of Self and Observers

Gender	Self		Observer	
	N	%	N	%
Females	1204	62.4	4597	58.7
Males	724	37.6	3230	41.3

Chi-square = 8.66, $p < .001$

Table 4 shows the distribution of respondents by ethnicity, using respondents only from the United States. Just over two-thirds of the respondents for both Self and Observer response categories identify their ethnicity as White/Caucasian. Among Self respondents about 10 percent are Asian/Pacific Islanders, nearly 9 percent are Black/African American, about 8 percent are Hispanic, less than one percent are Native American, and 5 percent indicate "Other." Among Observer respondents about 12 percent are Asian/Pacific Islanders, nearly 5 percent are Black/African American, about 8 percent are Hispanic, 1 percent are Native American, and almost 7 percent indicate "Other." Chi-square analysis reveals that the distributions by ethnicity are not equivalent among these two groups (chi-square = 27.5, $p < .001$).

Table 4:Ethnic Distribution of Self and Observers

Ethnicity	Self		Observer	
	N	%	N	%
Asian/Pacific Islander	133	10.3	647	12.0
Black/African American	112	8.6	283	5.3
Hispanic	105	8.1	434	8.1
Native American	8	0.6	55	1.0
White/Caucasian	870	67.1	3604	67.1
Other	69	5.2	351	6.5

Chi-square = 27.48, $p < .001$

Table 5 shows the distribution of respondents by their answer to the question:

"What is your country of origin or region of residence?" The majority of respondents in both samples (59%) indicated the United States. Respondents outside the U.S. came from 60 different countries, and for purposes of this analysis were combined to form an Outside the U.S. category. Chi-square analysis reveals that the distributions among U.S. and Outside the U.S. respondents is the same for these two groups (chi-square = 0.02, p = n.s.).

Table 5: Distribution of United States and Outside the U.S. Self and Observer Respondents

Nationality	Self		Observer	
	N	%	N	%
United States	1135	59.0	4624	59.2
Outside the U.S.	788	41.0	3185	40.8

Chi-square = 0.02, p = n.s.

Leadership Characteristics of Sample

Self respondents were asked three questions which (a) provided an assessment of their leadership skills compared to their peers, and indicated (b) the number of instances they had been a leader and (c) the extent they had participated in formal leadership development education. As shown in Table 6, in terms of their self-assessment, over two-thirds indicated that their leadership skills were "somewhat developed" (45.2%) or "well developed" (24.8%). Another 21 percent were equivocal about their leadership skills compared to their peers by selecting the response "similar with my peer group." About 8 percent responded that their leadership skills were "somewhat underdeveloped" and the remaining respondents (less than 1%) indicated "not well developed." The data in Table 7 shows that on the question about "How many opportunities have you had to be a leader?" most respondents replied affirmatively. Only a handful (0.5%) said that they had not had any opportunity to be a leader, 14 percent indicated that they had "a few" opportunities, with the most frequent response being "several" (38.5%), followed by

"some" (24.6%) and "many" (22.1%). Table 8 shows how leaders (Self) responded to the question of "how many 'formal' development opportunities in leading and/or leadership (e.g., a class, workshop, seminar, book, coaching, etc.) have you had?" There were no responses in either the "none" or "many" category (the two end points of the scale). The responses were nearly equally divided among the remaining three response categories of "a few" (35.5%), "some" (30.2%) and "several" (34.3%). While no specific numbers were associated with these descriptors they were arrayed in such a fashion as to provide an ordinal distribution (that is, "some" would be assumed to be more opportunities than "a few").

Table 6: Distribution of Self Responses on the Question of "Compared to my peers, I believe that my leadership skills are:"

Response Categories	N	%
1) Not well developed	17	0.9
2) Somewhat underdeveloped	153	7.9
3) Similar with my peer group	410	21.2
4) Somewhat developed	875	45.2
5) Well developed	481	24.8

Table 7: Distribution of Self Responses to the Question of "How many opportunities have you had to be a leader?"

Response Categories	N	%
1) None	9	0.5
2) A Few	276	14.3
3) Some	477	24.6
4) Several	746	38.5
5) Many	428	22.1

Table 8: Distribution of Self Responses on the Question of "How many "formal" development opportunities in leading and/or leadership (e.g., a class, workshop, seminar, book, coaching, etc.) have you had?"

Response Categories	N	%
1) None	0	0.0
2) A Few	276	14.3
3) Some	477	24.6
4) Several	746	38.5
5) Many	428	22.1

Table 9 and Table 10 shows the distribution of responses from Observers to two questions inquiring about their evaluation of their leader's skills as a leader compared to their peers and their level of satisfaction with the leadership exhibited or provided by this leader. This first question paralleled the question asked to the Self respondents (see Table 6). The vast majority of Observers responded quite favorably about the leadership skills of their leaders with nearly half reporting that their leader's skills were "well developed" (48.4%) and almost another one-third (32.1%) indicating "somewhat developed." About 15 percent felt that their leaders' skills were similar with their peer group; almost 4 percent said that these skills were "somewhat underdeveloped" and another 1 percent indicated that they were "not well developed." On the question "Overall, how satisfied are you with the leadership exhibited by the person you just reported about?" the majority of Observers were "very satisfied" (55.8%) and nearly another third (32.3%) were "somewhat satisfied." Almost 9 percent indicated that they were "neither satisfied nor dissatisfied" with their leaders, and less than 3 percent indicated that they were either "somewhat dissatisfied" or "not very satisfied."

Table 9: Distribution of Observer Responses to the Question of "I believe that the leadership skills of the person I just reported about are:"

Response Categories	N	%
1) Not well developed	88	1.1
2) Somewhat underdeveloped	302	3.8
3) Similar with his or her peer group	1174	14.6
4) Somewhat developed	2573	32.1
5) Well developed	3887	48.4

Table 10: Distribution of Observer Responses to the Question of "Overall, how satisfied are you with the leadership exhibited by the person you just reported about?"

Response Categories	N	%
1) Not very satisfied	77	1.0
2) Somewhat dissatisfied	183	2.3
3) Neither satisfied nor dissatisfied	692	8.6
4) Somewhat satisfied	2594	32.3
5) Very satisfied	4473	55.8

Leadership Practices of Student Leaders and Their Observers

Having examined the characteristics of the sample population, attention was directed to the five leadership practices as measured by the Student LPI. Table 11 shows the average (mean) scores and standard deviations on the Student LPI for the total sample (N = 38,944), as well as for Self (N = 8,208) and Observer (N = 30,736) respondents. Enabling Others to Act is the most frequently engaged in leadership practice, followed by Encouraging the Heart. The average scores for the next three leadership practices are closely grouped together: Modeling the Way, Challenging the Process and Inspiring a Shared Vision. This same pattern is demonstrated for both Self respondents as well as Observer respondents. Comparisons between the average scores of Self and Observers reveals a consistently significant difference ($p < .001$), with the responses of Observers higher than those from Self respondents.

Table 11: Means and Standard Deviations for the Student LPI for the Total Sample, Self Respondents, and Observer Respondents

	Model	Inspire	Challenge	Enable	Encourage
TOTAL SAMPLE					
Mean	22.41	22.09	22.10	24.41	23.04
Std Deviation	4.17	4.67	4.41	3.72	4.52
SELF					
Mean	21.40	20.95	20.97	23.88	22.34
Std Deviation	3.65	4.31	3.97	3.20	4.15
OBSERVER					
Mean	22.68	22.40	22.41	24.56	23.23
Std Deviation	4.26	4.71	4.48	3.83	4.59
t-values	27.3***	26.5***	28.3***	16.4***	16.9***

*** $p < .001$

Table 12 shows the internal reliability (Cronbach alpha) scores for the Student LPI. For the overall sample they are all quite strong, ranging between 0.80 (Modeling and Enabling) to 0.85 (Inspiring and Encouraging). For Self respondents they are very good ranging between 0.68 (Enabling) to 0.79 (Inspiring and Encouraging). For Observers the scores are all quite strong, ranging between 0.82 (Modeling and Enabling) to 0.86 (Modeling and Encouraging).

Table 12: Internal Reliability Coefficients (Cronbach Alpha) for the Student LPI

	Model	Inspire	Challenge	Enable	Encourage
Total Sample	.80	.85	.82	.80	.85
Self	.69	.79	.73	.68	.79
Observer	.82	.86	.84	.82	.86

Table 13 compares the average scores on the Student LPI of high school students with those from college students. Generally the differences within the groups (specific year in high school and specific year in college) were not statistically different from one another and hence were combined into the more global categorization. The data indicates that the scores of college students were higher on all five of the leadership practices from the perspective of both Self and Observer respondents. They were statistically different on Modeling, Inspiring and, Challenging for both Self and Observer respondents. Scores on Enabling and Encouraging were also statistically different between high school and college students from the perspective of Observers, but not for Self respondents.

Table 13: Comparison of High School and College Student scores on the Student LPI (standard deviations are in parenthesis)

	Model	Inspire	Challenge	Enable	Encourage
SELF					
High School (N=559)	20.89	20.43	20.76	23.70	22.68
	(3.40)	(4.06)	(3.72)	(3.05)	(3.76)
College (N=983)	22.12	21.81	21.51	24.00	22.71
	(3.30)	(4.03)	(3.71)	(3.07)	(4.05)
t-values	6.92***	6.44***	3.79***	1.89	0.15
OBSERVER					
Hi School (N=1751)	21.37	21.17	21.21	23.69	22.66
	(4.40)	(4.79)	(4.57)	(4.30)	(4.63)
College (N=3815)	24.05	23.97	23.69	25.30	24.22
	(3.92)	(4.24)	(4.19)	(3.66)	(4.41)
t-values	21.8***	21.0***	19.3***	13.6***	11.8***

*** $p < .001$

Table 14 compares the average scores on the Student LPI for female and male respondents. The responses were significantly higher on the Self version for males than for females on two leadership practices (Inspiring and Challenging) and the responses for females were significantly higher than males on two leadership practices (Enabling and

Encouraging). There were no differences by gender on Modeling for Self respondents. As for Observers, there were no significant differences by gender also for Modeling, as well as for Inspiring. Female Observers reported greater frequency than males on the other three leadership dimensions (Challenging, Enabling and Encouraging).

Table 14: Comparison of Scores on the Student LPI between Females and Males (standard deviations are in parenthesis)

	Model	Inspire	Challenge	Enable	Encourage
SELF					
Females (N=1203)	21.67	21.16	21.07	24.03	22.95
	(3.42)	(4.06)	(3.73)	(3.06)	(3.93)
Males (N=724)	21.90	21.63	21.47	23.63	22.16
	(3.31)	(4.07)	(3.64)	(3.04)	(3.89)
t-values	0.20	2.46**	2.28**	2.79**	4.29***
OBSERVERS					
Females (N=4596)	23.45	23.30	23.19	25.11	23.91
	(4.40)	(4.66)	(4.50)	(3.86)	(4.65)
Males (N=3230)	23.30	23.15	22.91	24.62	23.54
	(4.10)	(4.44)	(4.39)	(3.91)	(4.55)
t-values	1.63	1.44	2.74**	5.59***	3.50***

** $p < .01$ *** $p < .001$

Table 15 compares the average scores on the – Student LPI on the basis of respondent ethnicity, using only Self and Observer respondents from the United States. Native Americans were excluded from the analysis because of their small sample size. ANOVA results revealed no statically significant differences for Self respondents between Asian/Pacific Islanders, Blacks/African Americans, Hispanics and White/Caucasian on any of the five leadership practices. ANOVA results revealed statistically significant differences between these four groups for Observers, although *post hoc* analysis revealed that Asian/Pacific Islanders scored significantly lower than the other three groups, and this was true for all five leadership practices. The scores from

Blacks/African Americans, Hispanics, and White/Caucasian Observers did not significantly vary from one another across the five leadership practices.

Table 15: Comparison of Scores on the Student LPI by Respondent Ethnicity (standard deviations are in parenthesis)

	Model	Inspire	Challenge	Enable	Encourage
SELF					
Asian/Pacific Islander (N=133)	21.64	21.49	21.60	24.32	23.16
	(3.01)	(4.18)	(3.79)	(2.95)	(4.24)
Black/Afric American (N=112)	21.91	22.37	21.72	24.18	22.87
	(3.27)	(3.39)	(3.53)	(3.02)	(3.64)
Hispanic (N=133)	21.77	21.54	21.15	24.25	22.77
	(3.31)	(4.19)	(4.27)	(3.61)	(4.51)
White/Caucasian (N=870)	22.11	21.79	21.24	23.76	22.57
	(3.30)	(3.98)	(3.62)	(2.99)	(3.96)
ANOVA *F*	1.06	1.18	0.91	2.27	0.91
OBSERVER					
Asian/Pacific Islander (N=647)	22.35	22.37	22.18	24.31	23.29
	(4.75)	(4.72)	(4.72)	(4.36)	(4.73)
Black/Afric American (N=283)	24.25	24.25	23.88	25.39	24.17
	(4.09)	(4.27)	(4.32)	(3.88)	(4.72)
Hispanic (N=434)	24.38	24.48	23.96	25.61	24.53
	(4.06)	(4.28)	(4.26)	(3.43)	(4.43)
White/Caucasian (N=3604)	24.30	24.19	23.93	25.45	24.24
	(3.80)	(4.12)	(4.13)	(3.66)	(4.78)
ANOVA *F*	46.4***	36.7***	32.1***	18.7***	9.38***

*** $p < .001$

However, when the scores from Asian/Pacific Islanders, Blacks/African Americans, and Hispanics were combined into one group (People of Color) and compared with the sample of White/Caucasian respondents, a slightly different pattern emerged. For Self respondents, as the data in Table 16 shows, the differences were still not statistically different (*t*-tests) on Modeling, Inspiring, Challenging, and Encouraging, but reached statistical significance ($p < .01$) on the leadership practice of Enabling. Comparisons of People of Color and White/Caucasians from the Observer data indicates

that the former group reports significantly ($p < .001$) less frequent scores on all five leadership practices than the latter group does.

Table 16: Comparison of Scores on the Student LPI between Persons of Color and White/Caucasians (standard deviations are in parenthesis)

	Model	Inspire	Challenge	Enable	Encourage
SELF					
Persons of Color (N=350)	21.77	21.79	21.51	24.25	22.94
	(3.18)	(3.96)	(3.86)	(3.18)	(4.14)
White/Caucasian (N=870)	22.11	21.79	21.24	23.76	22.57
	(3.30)	(3.98)	(3.62)	(2.99)	(3.96)
t-values	1.66	0.02	1.13	2.59**	1.44
OBSERVER					
Persons of Color (N=1364)	23.39	23.43	23.10	24.95	23.87
	(4.38)	(4.60)	(4.58)	(4.03)	(4.66)
White/Caucasian (N=3604)	24.30	24.19	23.93	25.45	24.24
	(3.80)	(4.12)	(4.13)	(3.66)	(4.78)
t-values	6.78***	5.30***	5.86***	4.04***	2.62**

** $p < .01$ *** $p < .001$

Table 17 compares the average scores on the Student LPI on the basis of country of origin or region of residence. Because of relatively small sample sizes in respondents from specific countries outside the United States all of these respondents were combined into the category of "Outside the U.S." to differentiate them from respondents from the United States. For Self respondents from the United States their scores on Modeling and Inspiring were significantly higher than those from Outside the United States. No significant differences were found on the leadership practices of Challenging, Enabling and Encouraging. From the perspective of Observers, the scores from U.S. respondents were significantly higher than those from Outside the U.S. on all five leadership practices.

Table 17: Comparison of Scores on the Student LPI by Nationality (standard deviations are in parenthesis)

	Model	Inspire	Challenge	Enable	Encourage
SELF					
United States (N=1135)	22.04	21.78	21.23	23.88	22.61
	(3.34)	(3.94)	(3.65)	(3.02)	(4.03)
Outside the U.S. (N=787)	21.20	20.73	21.24	21.22	23.88
	(3.80)	(4.17)	(3.81)	(3.43)	(3.79)
t-values	5.43***	5.60***	0.05	0.05	0.06
OBSERVER					
United States (N=4624)	24.33	24.23	23.94	25.50	24.29
	(3.83)	(4.15)	(4.14)	(3.63)	(4.49)
Outside the U.S. (N=3184)	22.03	21.80	21.82	24.04	22.99
	(4.38)	(4.78)	(4.60)	(4.08)	(4.70)
t-values	23.9***	23.8 ***	21.8***	16.3***	12.4***

*** $p < .001$

Leadership Practices, Effectiveness and the Impact of Experience

The previous set of analyses examined the demographic characteristics of the sample, and how these variables may have impacted responses to the five leadership practices. The next series of analyses explored the relationship between the five leadership practices and effectiveness. Tables 6 through 8 reported on Self perceptions of leadership skill levels and opportunities to both be a leader and to take advantage of formal leadership development activities. Tables 9 and 10 reported on the leaders' skill set from the perspective of Observers and also indicated how satisfied Observers were with the leadership provided by their leaders. A leader effectiveness scale was created by combining the scores from Observers on these two questions (i.e., leaders' skills and leadership satisfaction), with internal reliability (Cronbach alpha) at 0.84. On the basis of this scale Observers were classified into (a) two groups, above and below the mean and (b) three groups, representing low, moderate and high leader effectiveness.

The data in Table 18 show that the results from statistical comparisons of these two different categorizations (below average and above average groups; and, low, moderate and high groups) were the same. Observers who reported that their leaders were

above average in effectiveness were seen as engaging in all five leadership practices significantly more than those leaders whose Observers reported them as below average in effectiveness. Similarly, creating three groupings on the leader effectiveness scale showed that as the reported effectiveness of the leaders increased so did their use of each of the five leadership practices as perceived by Observers.

Table 18: Comparison of Scores on the Student LPI by Leader Effectiveness from the Perspective of Observers (standard deviations are in parenthesis)

	Model	Inspire	Challenge	Enable	Encourage
Below Average (N=3271)	20.41	20.05	19.96	22.07	20.96
	(3.86)	(4.22)	(4.06)	(4.13)	(4.55)
Above Average (N=4730)	25.38	25.38	25.16	26.39	25.62
	(3.13)	(3.41)	(3.37)	(2.91)	(3.61)
t-values	61.1***	60.0***	60.2***	44.1***	48.9***
Low Effectiveness (N=3271)	20.41	20.05	19.96	22.07	20.96
	(3.86)	(4.22)	(4.06)	(4.13)	(4.55)
Moderate (N=1302)	23.45	23.31	23.10	24.95	23.65
	(2.94)	(3.39)	(3.29)	(3.04)	(3.62)
High Effectiveness (N=3429)	26.12	26.16	25.94	26.93	26.37
	(2.88)	(3.08)	(3.06)	(2.66)	(3.31)
ANOVA *F*	2473***	2373***	2389***	1305***	1604***

*** $p < .001$

Tables 19 and 20 show the analysis of how demographic characteristics impact leader effectiveness. Leader effectiveness was measured by the Self assessment of "my leadership skills compared with my peers" and by the responses to two assessment questions from Observers ("I believe that the leadership skills of the person I just reported about are?" and "How satisfied are you with the leadership of this individual?"). Four demographic variables were examined: educational level (High School versus College Students), gender (Females versus Males), ethnicity (People of Color versus White/Caucasian), and nationality (United States versus Out of U.S.). From the perspective of Self respondents, college students reported their skill level as leaders to be significantly higher than reported by high school students. Males reported greater leadership skills than females. White/Caucasian respondents reported higher skill levels

than People of Color. United States respondents reported higher skill levels than did people Outside the United States. This same pattern was shown from the perspective of Observers (Table 20) for educational level, ethnicity, and nationality. No significant differences were found on the basis of gender from Observers' perspectives.

Table 19: Comparison of Leader Effectiveness Scores by Demographic Variables for Self Respondents (standard deviations are in parenthesis)

	My Leadership Skills Compared to Peers
High School Students (N=559)	3.59 (0.91)
College Students (N=979)	4.02 (0.89)
t-value	9.02***
Females (N=1200)	3.78 (0.93)
Males (N=722)	3.96 (0.88)
t-value	4.03***
Persons of Color (N=349)	3.89 (0.89)
White/Caucasian (N=866)	4.05 (0.88)
t-value	2.80**
United States (N=1132)	4.02 (0.88)
Outside the U.S. (N=804)	3.61 (0.90)
t-value	9.87***

** $p < .01$ *** $p < .001$

Table 20: Comparison of Leader Effectiveness Scores by Demographic Variables for Observer Respondents (standard deviations are in parenthesis)

	Leadership Effectiveness (Skills and Satisfaction)
High School Students (N=1741)	7.92 (1.60)
College Students (N=3793)	8.89 (1.45)
t-value	20.0***
Females (N=4567)	8.67 (1.60)
Males (N=3210)	8.59 (1.59)
t-value	2.08
Persons of Color (N=1355)	8.65 (1.60)
White/Caucasian (N=3580)	8.98 (1.42)
t-value	6.79***
United States (N=4610)	8.98 (1.42)
Outside the U.S. (N=3414)	8.14 (1.71)
t-value	23.0***

*** $p < .001$

Further examination of the impact of demographic variables on effectiveness is shown in Tables 21through 24. In these analyses comparisons were made between "below average" and "above average" effectiveness groups on each of the demographic variables across the five leadership practices. Table 21 shows a comparison between leaders (Self) in high school that were below average on the assessment of their leadership skills with those who were above average on this same assessment. The results show that the above average group engaged significantly more frequently in all five leadership practices than those who perceived themselves as below average on this dimension. The same pattern for high school students was found from the perspective of Observers. As for college students, those above average on the effectiveness scale (comprised of responses to their assessment of their leaders' skills and satisfaction with this person's leadership) reported engaging in four leadership practices (Modeling, Inspiring, Challenging, and Encouraging) more than those who were below average on this scale. From the perspective of Observers, college students who were seen as above

average on effectiveness were also seen as engaging in all five leadership practices significantly more than those seen as below average on effectiveness.

Table 21: Comparison of Scores on the Student LPI for High School and College Students by Leader Effectiveness (standard deviations are in parenthesis)

	Model	Inspire	Challenge	Enable	Encourage
SELF High School Students					
Below Average (N=224)	19.33	18.50	19.08	23.17	21.57
	(3.06)	(3.94)	(3.40)	(3.01)	(3.68)
Above Average (N=334)	21.93	21.72	21.88	24.07	23.42
	(2.29)	(3.62)	(3.51)	(3.02)	(3.64)
t-values	9.55***	9.94***	9.41***	3.44***	5.85***
SELF College Students					
Below Average (N=223)	20.30	19.27	19.20	23.78	21.11
	(3.28)	(4.26)	(3.65)	(3.14)	(4.16)
Above Average (N=756)	22.66	22.54	22.16	24.05	23.17
	(3.12)	(3.63)	(3.43)	(3.05)	(3.89)
t-values	9.78***	10.41***	11.15***	1.15	6.84***
OBSERVER High School Students					
Below Average (N=1073)	19.47	19.14	19.26	22.28	20.99
	(3.91)	(4.26)	(4.07)	(4.33)	(4.51)
Above Average (N=674)	24.39	24.38	24.28	25.93	25.30
	(3.30)	(3.71)	(3.52)	(3.13)	(3.43)
t-values	28.7***	27.1 ***	27.3***	20.4***	22.6***
OBSERVER College Students					
Below Average (N=1249)	20.96	20.72	20.44	22.99	21.17
	(3.70)	(4.11)	(3.97)	(4.02)	(4.44)
Above Average (N=2543)	25.54	25.55	25.26	26.42	25.69
	(3.03)	(3.28)	(3.27)	(2.85)	(3.56)
t-values	37.9***	36.3 ***	37.2***	27.0***	31.4***

*** $p < .001$

Table 22 shows a comparison between female leaders (Self) that were below average on the assessment of their leadership skills with those who were above average on this same assessment. The results show that Self females in the above average group engaged significantly more frequently in all five leadership practices than those Self females who perceived themselves as below average on this dimension. The same pattern was found for females from the perspective of Observers. As for Self males, those above average on the effectiveness scale (comprised of responses to their assessment of their leaders' skills and satisfaction with this person's leadership) reported engaging in four leadership practices (Modeling, Inspiring, Challenging, and Encouraging) more than those who were below average on this scale. From the perspective of Observers, males who were seen as above average on effectiveness were also seen as engaging in all five leadership practices significantly more than those seen as below average on effectiveness.

Table 22: Comparison of Scores on the Student LPI for Females and Males by Leader Effectiveness (standard deviations are in parenthesis)

	Model	Inspire	Challenge	Enable	Encourage
SELF Females					
Below Average (N=400)	20.02	19.00	19.25	23.48	21.55
	(3.31)	(4.13)	(3.57)	(3.13)	(3.92)
Above Average (N=799)	22.49	22.23	21.96	24.30	23.64
	(3.17)	(3.56)	(3.46)	(2.97)	(3.74)
t-values	12.6***	13.3***	12.7***	4.45***	9.00***
SELF Males					
Below Average (N=178)	19.83	19.24	19.34	23.54	20.89
	(3.18)	(4.04)	(3.66)	(2.95)	(3.94)
Above Average (N=544)	22.31	22.40	22.14	23.64	22.56
	(3.11)	(3.76)	(3.35)	(3.07)	(3.78)
t-values	9.17***	9.54***	9.46***	0.37	5.08***
OBSERVER Females					
Below Average (N=1810)	20.07	19.91	19.91	22.87	21.05
	(3.89)	(4.26)	(4.02)	(4.12)	(4.58)
Above Average (N=2756)	25.52	25.50	25.32	26.57	25.77
	(3.13)	(3.43)	(43636	(2.86)	(3.65)
t-values	48.0***	46.8 ***	47.3***	33.3***	36.9***
OBSERVER Males					
Below Average (N=1349)	20.61	20.26	20.07	22.51	20.89
	(3.79)	(4.12)	(4.04)	(4.09)	(4.51)
Above Average (N=1861)	25.21	25.21	24.93	26.13	25.43
	(3.12)	(3.38)	(3.35)	(2.96)	(3.53)
t-values	36.5***	36.2 ***	36.1***	27.7***	30.7***

*** $p < .001$

Table 23 shows a comparison by ethnicity between People of Color (Self) that were below average on the assessment of their leadership skills with those who were above average on this same assessment. The results show that within the People of Color group that those in the above average category engaged significantly more frequently in four leadership practices (Modeling, Inspiring, Challenging, and Encouraging) than their counterparts who perceived themselves as below average on effectiveness. This same pattern was found for Self leaders in the White/Caucasian group. Those leaders who were reported as being above average in effectiveness from the perspective of Observers were seen as engaging in all five leadership practices more than those who were below average on this scale. This was true within both the People of Color and White/Caucasian groups.

Table 23: Comparison of Scores on the Student LPI for People of Color and Whites/Caucasians by Leader Effectiveness (standard deviations are in parenthesis)

	Model	Inspire	Challenge	Enable	Encourage
SELF People of Color					
Below Average (N=103)	20.60	19.80	19.89	24.11	21.96
	(3.46)	(4.08)	(3.99)	(3.48)	(4.00)
Above Average (N=246)	22.26	22.60	22.15	24.30	23.33
	(2.96)	(3.59)	(3.58)	(3.04)	(4.14)
t-values	4.55***	6.37***	5.19***	0.51	2.85**
SELF White/Caucasian					
Below Average (N=191)	20.29	19.58	19.04	23.62	20.91
	(3.31)	(4.18)	(3.47)	(2.89)	(4.14)
Above Average (N=675)	22.61	22.40	21.84	23.79	23.03
	(3.17)	(3.68)	(3.40)	(3.00)	(3.78)
t-values	8.83***	9.05***	9.89***	0.70	6.69***
OBSERVER People of Color					
Below Average (N=538)	20.27	20.28	19.80	22.63	21.04
	(4.807	(4.25)	(4.25)	(4.41)	(4.78)
Above Average (N=817)	25.41	25.48	25.25	26.45	25.70
	(3.23)	(3.54)	(3.34)	(2.91)	(3.53)
t-values	24.7***	23.5 ***	25.0***	17.7***	19.4***
OBSERVER White/Caucasian					
Below Average (N=1075)	21.16	20.81	20.50	23.02	21.00
	(3.63)	(3.98)	(3.90)	(4.14)	(4.54)
Above Average (N=2505)	25.63	25.62	25.38	26.48	25.61
	(3.00)	(3.24)	(3.26)	(2.86)	(3.66)
t-values	35.5***	35.0 ***	36.0***	25.0***	29.5***

** $p < .001$ *** $p < .001$

Table 24 shows a comparison by nationality within below and above average groups from the United States and Outside the United States. Leaders (Self) from the United States who reported themselves being below average in effectiveness also reported being engaged in four of the leadership practices (Modeling, Inspiring, Challenging, and Encouraging) less frequently than those who viewed themselves as above average in effectiveness. Observers from the United States reported that leaders in the above average effectiveness group engaged significantly more in all five leadership practices than did those who were reported as being below average in effectiveness. For those Outside the United States, the results from the Self and Observer respondents were the same; namely that those in the above average effectiveness group were significantly more frequently engaged in the five leadership practices than their counterparts seen as below average in effectiveness.

Table 24: Comparison of Scores on the Student LPI for United States and Outside the U.S. Respondents by Leader Effectiveness (standard deviations are in parenthesis)

	Model	Inspire	Challenge	Enable	Encourage
SELF United States Students					
Below Average (N=268)	22.40	19.76	19.22	23.85	21.19
	(3.34)	(4.13)	(3.60)	(2.90)	(4.08)
Above Average (N=864)	22.54	22.39	21.83	23.88	23.03
	(3.17)	(3.64)	(3.43)	(3.05)	(3.90)
t-values	9.53***	9.36***	10.77***	0.14	6.66***
SELF Outside the U.S. Students					
Below Average (N=312)	19.58	18.48	19.30	23.19	21.48
	(3.16)	(3.99)	(3.64)	(3.17)	(3.80)
Above Average (N=491)	22.25	22.16	22.45	24.33	25.37
	(3.10)	(3.62)	(3.36)	(2.98)	(3.57)
t-values	11.83***	13.49***	12.52***	5.15****	7.86***
OBSERVER United States Students					
Below Average (N=1385)	21.14	20.84	20.47	23.10	21.06
	(3.66)	(4.01)	(3.91)	(4.09)	(4.59)
Above Average (N=3210)	25.68	25.67	25.41	26.53	25.67
	(3.00)	(3.27)	(3.25)	(2.86)	(3.66)
t-values	40.6***	39.5 ***	41.2***	28.3***	33.2***
OBSERVER Outside the U.S. Students					
Below Average (N=1886)	19.87	19.46	19.59	22.40	20.88
	(3.91)	(4.27)	(4.12)	(4.14)	(4.53)
Above Average (N=2476)	24.76	24.76	24.63	26.09	25.52
	(3.31)	(3.62)	(3.55)	(2.99)	(3.50)
t-values	39.5***	39.2 ***	38.3***	30.2***	33.7***

*** $p < .001$

Table 25 shows the analysis of how leadership *experience* ("opportunities to be a leader") influenced how frequently respondents engaged in the five leadership practices. The distribution of responses to this question was shown in Table 7, and for purposes of this analysis the category of "none" was discarded because of negligible sample size (N=9) and the categories of "A Few" and "Some" were combined to provide three roughly equal-sized and meaningful categorizations. ANOVA results revealed a consistent pattern indicating that the more experiences or opportunities the respondent reported having for being a leader the more often he/she engaged in each of the five leadership practices. Comparisons between the three groups revealed that the first group was always significantly different from the other two levels of experience; while "several" were different from "many" experiences on Inspiring and Challenging but not for Modeling, Enabling and Encouraging.

Table 25: Comparison of Scores on the Student LPI by the Frequency of the Leader's (Self) Opportunities to be a Leader (standard deviations are in parenthesis)

	Model	Inspire	Challenge	Enable	Encourage
A Few/Some (N=752)	20.68	19.93	20.20	23.63	21.83
	(3.40)	(4.17)	(3.80)	(3.01)	(4.06)
Several (N=746)	22.19	21.95	21.55	23.95	23.10
	(3.12)	(3.66)	(3.51)	(2.97)	(3.77)
Several (N=428)	22.68	22.80	22.46	24.21	23.38
	(3.26)	(3.73)	(3.36)	(3.23)	(3.70)
ANOVA *F*	64.7***	89.4***	59.0***	5.30**	29.6***

** $p < .01$ *** $p < .001$

Table 26 shows the analysis of how the "number of formal leadership development opportunities" influenced how frequently respondents engaged in the five leadership practices. The distribution of responses to this question were shown in Table 8, and for purposes of this analysis the category of "none" and "many" were excluded because no one selected them. ANOVA results showed a consistent pattern showing that as the number of formal leadership development opportunities the respondent reported

having the more often the leader reported engaging in each of the five leadership practices. Respondents in the category of "a few" development opportunities engaged less than their counterparts in the "some" category on all Modeling, Inspiring, Challenging and Encouraging, and significantly less on all five leadership practices compared with those in the "several" category. Those in the "some" experiences category consistently engaged less frequently in the five leadership practices than did those in the "several" category.

Table 26: Comparison of Scores on the Student LPI by the Number of Formal Leadership Development Opportunities Reported by the Leader (standard deviations are in parenthesis)

	Model	Inspire	Challenge	Enable	Encourage
A Few (N=686)	20.99	20.24	20.32	23.63	21.85
	(3.47)	(4.35)	(3.85)	(3.05)	(4.14)
Some (N=584)	21.62	21.30	21.15	23.83	22.71
	(3.27)	(3.79)	(3.57)	(3.00)	(3.78)
Several (N=662)	22.48	22.49	22.18	24.17	23.44
	(3.21)	(3.65)	(3.40)	(3.08)	(3.67)
ANOVA *F*	34.1***	54.2***	44.6***	50.9***	28.4***

*** $p < .001$

Summary

The data collected over a two-year period (August 2007 - August 2009) from the online administration of the Student LPI shows continued strong support for the psychometric properties of the instrument. Internal reliability coefficients are generally strong for both the Self and Observer versions of the Student LPI. Scores from Observers are generally higher than those reported by Self respondents.

Analysis of demographic characteristics indicates that year in school makes a difference in the reported frequency to which student leaders engaged in the five leadership practices. With more years of schooling, reflected in age and opportunities, respondents made greater use of the five leadership practices. The results by gender do not reveal any particular consistency, with females reported engaging in some practices

more than males and males reported engaging in some practices more than females. While the overall analysis by ethnicity shows a significant difference between Persons of Color and Whites/Caucasians, further comparisons indicate that this is mostly due to differences between Asian/Pacific Islander respondents and the other comparison groups (Black/African Americans, Hispanics, and White/Caucasians). Finally, the results indicate that students from the United States report a significantly greater use of the five leadership practices than do their counterparts Outside the U.S.

Effectiveness assessments show a consistent pattern supporting the validity of the Student LPI. The more effective or skillful respondents report themselves being, in turn, the more they indicate engaging in the five leadership practices. This is true from both the leader's (Self) perspective as well as the perspective of their constituents (Observers). Likewise, as the leadership experience reported by leaders increases so does their reported frequency of using the five leadership practices. As well, the more developmental opportunities that leaders indicate they have participated in, the more frequently do they report engaging in the five leadership practices. These latter results are supported by the finding that college students report engaging in the five leadership practices more frequently than do high school students, presumably because they have had either more leadership experiences or more leadership development opportunities.

While U.S. participants indicated greater use of the five leadership practices than do their counterparts Outside of the United States, these differences do not obscure the fact that analyses revealed that the general relationship found between the use of the leadership practices and effectiveness did not vary between those students within or outside of the United States. Likewise, analyses by year in school, gender and ethnicity reveal that while there may be differences *between* people based on these demographic variables, the same patterns are found *within* these categories between those who were below and above average in effectiveness. That is, those who engaged more versus less in the five leadership practices are seen by themselves and others as more effective leaders. This finding lends further credence to the instrument's validity.

Given these results about the psychometric properties of the Student LPI, leadership educators and student leaders themselves should have confidence that the instrument is a reliable assessment of their leadership behavior and valid indicator of

their leadership effectiveness. The Student LPI can be used to establish baseline (first-time) data about the behaviors and skills of student leaders that can be used to further their subsequent leadership development. The Student LPI can assess changes in leadership skills through administration of pre and post-treatment interventions (e.g., Posner, 2009). In this way, the Student LPI can be employed by participants themselves as well as educators to track improvements in leadership behaviors over time.

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