The Leadership Attitudes and Beliefs Scale: An Instrument for Evaluating College Students' Thinking About Leadership and Organizations

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Allen, Stelzner, and Wielkiewicz (1998) theorized that leadership may be understood through the principles of ecology and systems thinking. Development of a measure of thinking about leadership processes consistent with this theory is reported. The total sample consisted of 288 males and 387 females with 173 first-year students, 148 sophomores, 167 juniors, 168 seniors, and 16 faculty, staff, and graduate students. Most participants (93.2%) were between the ages of 17 and 22 years and about 93.5% were Caucasian. The resulting measure consisted of two, 14-item, orthogonal dimensions: Hierarchical Thinking and Systemic Thinking, with alpha coefficients of .88 and .84, respectively. A two-dimensional model of the way that people think about leadership processes is discussed.

Traditional thinking about leadership holds that organizational responsibilities are assigned to special individuals in positions of leadership such as president, CEO, military general, sales manager, team captain, or supervisor (e.g., Norburn, 1989). According to Chemers (1997) the leader's actions are more critical than those of any other member of the group, and the "most competent and loyal group members" are placed in positions of leadership where they assume increased responsibility and authority. In this view, the leaders of an organization are responsible for its overall direction and success, and the focus of leadership studies is how to make these individuals more effective.

On the other hand, traditional, position-based, leadership models have been challenged by alternative views such as the transformational model (Bass, 1985; House, 1977; Howell & Avolio, 1993; Sashkin & Burke, 1990), charismatic leadership (Conger, 1989; Conger & Kanungo, 1988, 1994), nonhierarchical leadership (Hall, 1979), change-centered leadership (Ekvall & Arvonen, 1991), substitutes for leadership (Kerr & Jermier, 1978; Podsakoff & MacKenzie, 1994), democratic leadership (Gastil, 1994), organizational citizenship (Organ, 1988; Schnake, Dumler, & Cochran, 1992), self-leadership (e.g., Anderson & Prussia, 1997), and the ecological or systemic approach to leadership (Allen, Stelzner, & Wielkiewicz, 1998).

The theory proposed by Allen et al. (1998) suggested that leadership may be best understood through application of the principles of ecology and systems theory. This leadership theory begins with the assumption that organizations exist within a complex system of universal adaptive challenges (Heifetz, 1994) such as living within the limits of our natural environment, adapting to changes in social ecology, coping with increasing volumes of information, and developing an increasingly global perspective. Each universal adaptive challenge is a complex system that adds exponentially to the complexity with which organizations must cope. These challenges create an urgent need for viewing leadership in a way that matches the complexity of the systems to which organizations must respond. Putting responsibility for organizational success into the hands of a few positional leaders is inadequate for dealing with the complexities of the modern world.

A good analogy of the way these adaptive challenges add to the complexity of our environment is to consider global warming, an ecological issue so complex that it has generated an emotional debate over its very existence. Global

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warming is the result of greenhouse gases, mainly carbon dioxide, that cause heat to be reflected back to the earth instead of being radiated into space. The interconnections among the affected ecological systems are very complex and difficult to understand. However, the impact of a global rise in temperature clearly would be far reaching —including shifts in agricultural zones, a rise in sea level, changes in the ecology of human social structure, and extreme temperature declines in Europe. Another complication is that greenhouse gases released now will take years to actually impact global temperature trends. Thus, the ecological context in which global warming may occur is so complex that predictions are extremely difficult to model, but global warming could lead to an ecological and social disaster (Calvin, 1998). The problem of global warming is so complex that no single individual would be capable of leading us out of the potential crisis. Instead, it will take a cooperative effort of scientists, politicians, nations, manufacturing organizations, and others to bring this potential crisis to a beneficial resolution.

According to Allen et al. (1998), the same is true for organizations. No single individual is capable of leading an organization in the sense that the word has traditionally been used. Instead, a successful organization must function like a complex adaptive system itself. Rather than being run in a hierarchical, top-down manner, organizational leadership will need to draw on ecological principles to match the complexity of the systems in which organizations function. This means that positional leaders must facilitate, rather than constrain, the flow of information within organizations and broaden, rather than restrict, participation in decision-making processes. Effective leadership processes will consist of involving the right people in problem solving and facilitating processes that allow individuals to come together in genuine dialogue where differences are respectfully explored. With these kinds of processes in place, organizational decisions will be influenced by a multitude of information sources and perspectives instead of the limited information that can be processed by positional leaders.

Allen et al. (1998) argued that the complexities of adaptive challenges, the speed with which the tastes and needs of global markets can change, the speed of technological and scientific advances, and other factors that impact organizational adaptability require a redefinition of "leadership." They defined leadership as a process "that emerges from individual actions and interactions which influence systems both inside and outside an organization. Each individual action in the system potentially influences the leadership process" (p. 72). Whereas many theories of leadership emphasize how to improve the effectiveness of individual leaders, Allen et al. have focused on the systemic processes of influence, not control by the positional leader. Effective leadership processes, then, are characterized by shared responsibility for organizational adaptation, which requires a consistent emphasis upon development of human assets and open communication among all organizational members. Following the principles of ecology, the greater the diversity of ideas, passions, skills, and interests that influence decision-making, the more adaptable the organization will be.

An important component of the theory of Allen et al. (1998) is the feedback loop, which is itself a critical component of systems and ecological theory (Capra, 1996). A feedback loop is a process in which incoming information causes a change in a system that, in turn, also changes the incoming feedback. Student course evaluations are a good example. Information from course evaluations leads to changes in a course, which then leads to changes in student feedback. Organizations are subjected to an infinite number of feedback loops, such as poll results, profits, customer satisfaction, and competitive pressures. Some feedback loops are critical to survival, and some are apparently trivial. The key to organizational adaptation and survival is to identify the crucial feedback loops and respond appropriately to them. Organizations that attempt to limit the feedback loops to which they respond are the least adaptable, depending upon the degree of closure. A strictly hierarchical organization, then, would be the least adaptive. On the other hand, organizations that are open to the greatest diversity of feedback loops are likely to be the most successful in the long term.

The theory proposed by Allen et al. (1998) was developed in the context of a grant-funded initiative designed to explores alternatives to the traditional concept of assigning organizational responsibilities to leaders in defined positions (positional leadership). The initiative consisted of administrators, faculty, and students who met regularly to discuss leadership issues, plan activities, and develop ways of increasing awareness of leadership issues among members of the campus communities. The full participation of a student working group was an important component of the initiative. This group made presentations to hundreds of students in first-year classes, clubs, and student government. One of their projects was publishing a checklist of activities and challenges for developing an understanding of leadership that was distributed campus-wide and incorporated into the current research. An important goal of the leadership initiative was to assess the impact of the grant-sponsored activities on the general student population.

Although many instruments for assessing alternative leadership styles exist (Clark & Clark, 1990), they focus on leadership behaviors of people occupying specific leadership positions. A good example is the Student Leadership Practices Inventory (Kouzes & Posner, 1998; Posner & Brodsky, 1992). This measure was developed for assessing student leaders and would be inappropriate for assessing students who may not perceive themselves as being in any kind of leadership position. A measure focusing on attitudes and beliefs regarding the nature of leadership was needed for determining what college students and others think about leadership processes and how they expect leaders to function. The Leadership Attitudes and Beliefs Scale (LABS) was developed for this purpose.

In sum, the purpose of the current research was to develop a leadership assessment instrument useful for assessing attitudes and beliefs about leadership in college students and others. The researcher hypothesized that the pool of 86 items would produce several orthogonal dimensions. Furthermore, the researcher expected that participants reporting themselves to be active members of the leadership program on their campus would differ significantly from those who were not members of a leadership program and that several typical college student experiences would be associated with different scores on the scales.

METHOD

Participants

Participants were 676 individuals from two educational institutions. The majority were from two private, Catholic, single-sex, liberal arts campuses, enrolling about 93.5% Caucasian students, and with a joint academic curriculum and course catalog that, for all practical purposes, cause the two campuses to function as a single educational institution. One campus enrolls only females and the other, only males. Thus, a representative sample from both campuses would be required to represent both males and females. These two campuses had been jointly awarded a leadership development grant, the purpose of which was to explore alternatives to the hierarchical model of leadership in a context emphasizing social responsibility and gender issues. A representative sample of 552 students from these two campuses was obtained. The sample consisted of 160 first-year students, 128 sophomores, 128 juniors, and 136 seniors. There were 243 males and 313 females and approximately 93.5% were White. A chi-square goodness of fit test revealed that the proportions of students for both class and sex did not differ significantly from proportions for the same groups provided by the registrar, χ^2 (7, N = 552) = 8.37, $p > .250$.

Another nonrepresentative group of 38 males and 67 females (1 with missing data) was recruited from a state-supported university in the Midwest that also had an active leadership development program, although its philosophy was less developed and more traditional than the program at the other two schools.

The entire sample consisted of 288 males and 387 females with 173 first-year students, 148 sophomores, 167 juniors, 168 seniors, and 16 faculty, staff, and graduate students. Most participants (93.2%) were between the ages of 17 and 22 years, and 72.0% reported that they

had occupied a position of leadership within the last year. About 7.1% (n = 48) were active members of a campus leadership development initiative.

Materials

The LABS-R consisted of 86 statements and descriptions related to leadership and organizational adaptability. Response options were: *strongly agree*, *agree*, *neither agree nor disagree*, *disagree*, and *strongly disagree*.

The first step in the development of the LABS was to review selected components of the leadership literature (Allen et al., 1998; Bass & Avolio, 1990, 1994; Ekvall & Arvonen, 1991; Mitchell, 1993; Mitchell & Scott, 1990; Posner & Brodsky, 1992; Whitt, 1994) for ideas regarding appropriate item content. Members of the leadership program were also asked to suggest items. The LABS then was subjected to two rounds of empirical testing involving 985 participants (Wielkiewicz, 1998) out of which emerged four of the dimensions that were included in the LABS-R, which was the instrument evaluated in the current study. For the current study, these four dimensions were represented both by new items and by items from the prior analyses. The LABS-R also included items that were intended to measure four new dimensions of beliefs about leadership (Change-Centered; Systemic Thinking; Positional Leadership Dependence; and Cooperative Leadership Processes) that were not included in Wielkiewicz (1998). Thus, the LABS-R contained 86 items intended to measure eight dimensions of leadership processes related to the ecological or systems theory proposed by Allen et al. (1998).

Authority. This eight-item scale reflected the belief that positional leaders should exercise authority or control in decision-making within a hierarchical organizational structure through which such decisions are implemented. This scale proved very reliable (alpha = .86) and robust across the two previous analyses (Wielkiewicz, 1998). Items include: (a) "A leader should maintain complete authority," and (b) "A leader must maintain tight control of the organization."

Relationship Orientation. The original eight-item version of this scale proved robust across both prior analyses with coefficient alpha of .87. The intent was to measure the participant's views regarding the importance of cooperation in an organizational context. The construct is similar to Individualized Consideration (Bass & Avolio, 1994). A problem with the scale was that it emphasized the role of the positional leader in the organization which was not consistent with the theory developed by Allen et al. (1998). Thus, for the current study new items were added that removed the emphasis on a positional leader and put the focus directly on the issue of human relationships and their role in organizations. Items include: (a) "Effective organizations encourage open communication," and (b) "Effective organizations acknowledge the contributions of group members."

Ethics. The purpose was to measure the extent to which the individual believes that ethical considerations should play a role in leadership (Mitchell, 1993; Mitchell & Scott, 1990). Reliability of the four original items was .78. Items include: (a) "Good leadership requires that ethical issues have high priority," and (b) "All organizations should work to preserve natural resources and the environment."

Learning Orientation. This group of items was designed to measure the participant's desire to continue their own personal development through learning and their belief in the idea that organizations need to focus on learning and innovation to be successful (e.g., Allen et al., 1998; Senge, 1990). This four-item version showed very good reliability (alpha = .80), especially considering the small number of items. In the current study additional items were developed for this scale with the intent of improving reliability. Items include: (a) "Successful organizations make continuous learning their highest priority," and (b) "I value opportunities for my own personal development."

In addition to the four previous dimensions —all based upon prior empirical work—the LABS-R contained new items that were intended to measure the following characteristics of perceptions about leadership:

Change-Centered. Based upon the concept introduced by Ekvall and Arvonen (1991), the scale was intended to measure the extent to which

participants believe that leadership processes should be open to change, an orientation toward the future, new ideas, and risk-taking. Items include: (a) "Leadership should generate new and different ways of doing things," and (b) "Effective organizations push for growth."

Systemic Thinking. This scale was developed to assess the extent to which the individual believed that systemic processes and forces (Allen et al., 1998) influence leadership processes. Items include: (a) "An effective organization adapts to feedback from both inside and outside the organization," and (b) "Organizations are affected by unavoidable challenges from the environment."

Positional Leadership Dependence. These items were developed as a measure of the extent to which the person believed that leadership processes depend upon the actions of positional leaders. Items include: (a) "It is best to voice your own ideas only when the leader requests input," and (b) "The responsibility for taking risks lies with the leaders of an organization."

Cooperative Leadership Processes. The goal in writing this group of items was to create a scale that accurately reflected cooperative or open leadership processes (Allen et al., 1998; Johnson, Johnson, & Smith, 1991) independently of the concept of an orientation toward human relationships. Items include: (a) "Leadership can emerge from ANY individual in an organization," and (b) "Decisions can be made by forming a consensus acceptable to everyone in the group."

In addition to the 86 LABS-R items, participants completed a page of 8 demographic items and another page of 24 items concerning participation in various experiences common to college students, such as attending cultural events, studying abroad, working on or off campus, voting, and donating to a community food bank. These questions were adapted from a leadership development checklist which had been developed by the student members of the leadership initiative on the campuses that received the leadership development grant. The purpose of the checklist was to suggest to students activities that would enhance their development and understanding of leadership processes. An adapted version of this checklist was included in the current study as a potential indicator of scale validity.

Procedure

Surveys were distributed to introductory psychology classes ($n = 208$) who were offered extra credit for participation, participants in leadership development activities ($n = 234$), and various classes ($n = 442$) for a total of 884 surveys. Of

TABLE 1.

Number of Items, Coefficient Alpha, Mean Interitem Correlations (M_r), Scale Means, and Scale Standard Deviations for the Eight Conceptual Scales

	Items	Alpha	M_r	*M*	*SD*
Authority	8	.8666	.4482	25.09	6.02
Ethics	8	.8205	.3700	16.57	4.69
Learning	8	.8570	.4393	13.36	3.94
Relationship	8	.8472	.4140	13.50	3.93
Change	5	.7593	.3911	9.39	2.43
Leader Dependence	9	.7523	.2530	25.89	5.00
Systemic Thinking	8	.8344	.3901	14.67	3.81
Cooperation	8	.8207	.3822	13.87	3.95

Note. Analysis based upon the total sample of 676 participants.

TABLE 2.
Unrotated Principal Components Loadings and Communalities (h^2) for the Eight Conceptual Scales

	Component		
Scale	1	2	h^2
Authority	—	.940	.891
Ethics	.766	—	.587
Learning	.878	—	.772
Relationship	.883	—	.780
Change	.872	—	.785
Leader Dependence	—	.940	.892
Systemic Thinking	.907	—	.824
Cooperation	.853	—	.733

Note. Analysis based upon the total sample of 676 participants with 2 excluded due to missing data. Coefficients below .300 are not shown to increase clarity.

these surveys, 676, (76.4%) were included in the analysis. Surveys with one or more pages of the survey packet not completed were excluded.

RESULTS

All statistical analyses were performed using SPSS for Windows, Version 9.0 with alpha set at .05. Each of the eight conceptual scales was first subjected to a reliability analysis. The purpose was to develop eight scales based upon the conceptual model. All the items related to each of the eight scales were included in the initial reliability analysis, and items with the lowest corrected item-total correlations were removed from each scale. Table 1 shows the characteristics of the resulting scales. An inspection of correlations among the eight scales revealed a clear pattern: Two of the conceptual scales (Authority and Leader Dependence) were strongly related to each other ($r = .773$, $n = 674$, $p < .000$), and unrelated to the other six scales, whereas these six scales were strongly related to each other with correlations ranging from $r = .528$ to $r = .829$ and averaging .687.

A principal components analysis (see Table 2) confirmed this interpretation. Two components were extracted. Component 1 (eigenvalue = 4.462) represented a combination of the Ethics, Learning, Relationship, Change, Systemic Thinking, and Cooperation scales. Component 2 (eigenvalue = 1.801) represented a combination of the Authority and Leadership Dependence scales. Together, the two components accounted for 78.3% of the total variance. All other components had eigenvalues less than 1.00. This outcome revealed that the eight original, conceptually-based scales could be more parsimoniously described as consisting of two independent dimensions. The first dimension was named Systemic Thinking and the second dimension was named Hierarchical Thinking. Scales were constructed to represent each of these two dimensions using items from each of the eight original dimensions that met two criteria: (a) The corrected item-total correlations from the previous reliability analyses needed to be greater than .30, and (b) each item needed to make a unique contribution to its respective scale based upon its content. Fourteen items were chosen to represent each of the two new dimensions. These items were then subjected to a principal components analysis to determine whether two components emerged as expected. Results of this analysis are shown in Table 3.

Four components with eigenvalues greater than 1.00 were extracted. The first component (eigenvalue = 6.097) consisted of the 14 items selected to represent the Systemic Thinking dimension. The second component (eigenvalue = 5.291) consisted of the 14 items selected to represent the Hierarchical Thinking dimension. These two components accounted for 40.7% of the total variance. A third and fourth component (eigenvalues = 1.255, 1.026; 4.5%, 3.7% of variance, respectively) were also extracted. The six items that loaded on these two components showed loadings ranging from .414 to −.381, which was a lower magnitude than the loadings on either of the first two components. Although perhaps interesting in future research, these components seem to have little practical value at this time.

Thus, the final scale, the LABS-III, consisted of 28 items, with 14 items representing each of two dimensions, Hierarchical Thinking and Systemic Thinking. The Hierarchical Thinking scale consists of 14 items that suggest organizations should be organized in a stable hierarchical manner with power and control focused in the upper levels of the hierarchy. Hierarchical Thinking also captures the idea that the upper levels of the hierarchy are responsible for the success of the organization and the safety and security of its members. The Systemic Thinking scale consists of 14 items reflecting an ability to relate a variety of ideas and concepts to organizational success, such as ethics, the need for cooperation of all individuals to help the organization accomplish goals, the need for long-term thinking, and the need for organizational learning. Thus, this style of thinking is characterized by being able to relate organizational success to the complex interaction of a number of factors. Table 4 shows descriptive statistics for these two scales based upon the representative sample of males and females from the small, private, liberal arts colleges, and Table 5 shows the actual items for both scales. The correlation between the Hierarchical Thinking and Systemic Thinking scales was .025, clearly not statistically significant (n = 676).

Males (n = 243) and females (n = 309) in the representative sample differed significantly on Hierarchical Thinking, $t(550) = 4.70$, $p = .000$ (effect size = .403). Means for women and men were 43.64 (SD = 7.37) and 40.57 (SD = 7.73), respectively. Women (M = 26.57; SD = 6.12) and men (M = 28.35; SD = 6.77) also differed significantly on the Systemic Thinking scale, $t(550) = 3.231$, $p = .001$ (effect size = .277). Men endorsed a view of organizations that placed less importance on Systemic Thinking and more importance on Hierarchical Thinking than women did.

Scores on the Hierarchical Thinking and Systemic Thinking scales were also compared for those who were members of the representative sample from the small, Catholic, liberal arts colleges versus participants from the larger public university. Those from the representative sample (n = 552) and those from the public

TABLE 3.

Unrotated Principal Component Loadings and Communalities (h^2) for the Items Included in the LABS-III

	Component				
	1	2	3	4	h^2
Item 2	.724	—	—	—	.527
Item 12	.725	—	—	—	.552
Item 9	.721	—	—	—	.534
Item 14	.706	—	—	—	.551
Item 11	.702	—	—	—	.551
Item 1	.692	—	.342	—	.616
Item 26	.676	—	—	—	.490
Item 4	.658	—	.329	—	.558
Item 24	.632	—	—	—	.516
Item 20	.602	—	—	—	.410
Item 5	.589	—	.347	—	.539
Item 18	.582	—	—	—	.478
Item 19	.541	—	—	—	.330
Item 23	.513	—	−.381	.414	.584
Item 6	—	.734	—	—	.625
Item 3	—	.704	—	—	.529
Item 10	—	.684	—	—	.485
Item 13	—	.684	—	—	.482
Item 15	—	.658	—	—	.518
Item 7	—	.668	—	—	.511
Item 8	—	.615	—	—	.511
Item 16	—	.594	.312	.337	.567
Item 17	—	.583	—	—	.477
Item 22	—	.559	—	—	.396
Item 21	—	.535	—	—	.336
Item 25	—	.524	—	—	.331
Item 27	—	.450	—	—	.293
Item 28	—	.446	.378	—	.375

Note. Analysis based upon the total sample of 676 participants. Coefficients below .300 are not shown.

TABLE 4.

Number of Items, Coefficient Alpha, Mean Interitem Correlations (M_r), Scale Means, Scale Medians, Scale Standard Deviations, and Kurtosis for the Hierarchical Thinking and Systemic Thinking Scales

	Items	Alpha	M_r	*M*	*Mdn*	*SD*	Kurtosis
Hierarchical Thinking	14	.8439	.275	42.3	43	7.67	0.167
Systemic Thinking	14	.8792	.358	27.4	28	6.45	2.539

Note. Statistics based upon the representative sample of 552 participants.

university (n = 102) differed significantly on Hierarchical Thinking, $t(652) = 3.386$, $p < .001$. Means for the representative sample and the public university were 42.30 (SD = 7.67) and 39.34 (SD = 10.17), respectively. The effect size was .365. The representative sample (M = 27.36; SD = 6.47) and the public university sample (M = 24.34; SD = 6.61) also differed significantly on the Systemic Thinking scale, $t(652) = 4.305$, $p < .000$ (effect size = .464). Members of the representative sample endorsed a view of organizations with less emphasis on Systemic Thinking and less emphasis on Hierarchical Thinking than did members of the public university sample.

Means on the two scales were compared for those who reported participating in each activity on the leadership development checklist versus those who did not. Table 6 displays the results of independent samples t tests for the seven activities that were associated with significant differences on either the Hierarchical Thinking or Systemic Thinking scale. Because this analysis was primarily exploratory, no attempt was made to control for Type I errors. With respect to the Hierarchical Thinking scale, those who had studied abroad for a semester, volunteered with a service organization, or reported participating in a creative art (music, drawing, etc.) all placed less importance on hierarchical thinking about leadership processes than those who did not have these experiences. Those who reported being members of a varsity or junior varsity athletic team placed more importance on hierarchical thinking about leadership. With respect to the Systemic Thinking scale, those who studied abroad, attended a cultural event at least once per week, volunteered with a service organization, participated in a creative art, reported placing materials in containers for recycling, or making entries in a personal journal were more systemic in their thinking about leadership processes than those who did not have these experiences.

DISCUSSION

The goal of the present study was to develop a measure of thinking about leadership processes, consistent with the theory proposed by Allen et al. (1998), that could be administered to individuals irrespective of their experience in leadership positions. Based upon previous exploratory research (Wielkiewicz, 1998) a conceptual model of leadership was proposed that consisted of eight components: Authority, Ethics, Learning Orientation, Relationship Orientation, Change, Leader Dependence, Systemic Thinking, and Cooperation. Empirical analysis of the resulting scales showed that the Authority and Leader Dependence scales were strongly correlated with each other and not correlated with any of the other scales which were all strongly related to each other. A principle components analysis confirmed that two uncorrelated dimensions, Hierarchical Thinking and Systemic Thinking, could explain the variability among the eight scales in the original conceptual model. Two 14-item scales were then developed to reflect these dimensions.

TABLE 5.
The LABS-III Items

1	Individuals need to take initiative to help their organization accomplish its goals.
2	Leadership should encourage innovation.
3	A leader must maintain tight control of the organization.
4	Everyone in an organization needs to be responsible for accomplishing organizational goals.
5	Leadership processes involve the participation of all organization members.
6	A leader must control the group or organization.
7	A leader should maintain complete authority.
8	A leader should take charge of the group.
9	Organizational actions should improve life for future generations.
10	The main task of a leader is to make the important decisions for an organization.
11	Leadership activities should foster discussions about the future.
12	Effective leadership seeks out resources needed to adapt to a changing world.
13	The main tasks of a leader are to make and then communicate decisions.
14	An effective organization develops its human resources.
15	It is important that a single leader emerges in a group.
16	Members should be completely loyal to the designated leaders of an organization.
17	The most important members of an organization are its leaders.
18	Anticipating the future is one of the most important roles of leadership processes.
19	Good leadership requires that ethical issues have high priority.
20	Successful organizations make continuous learning their highest priority.
21	Positional leaders deserve credit for the success of an organization
22	The responsibility for taking risks lies with the leaders of an organization.
23	Environmental preservation should be a core value of every organization.
24	Organizations must be ready to adapt to changes that occur outside the organization.
25	When an organization is in danger of failure, new leaders are needed to fix its problems.
26	An organization needs flexibility in order to adapt to a rapidly changing world.
27	Leaders are responsible for the security of organization members.
28	An organization should try to remain as stable as possible.

Note.
Each item is rated on a scale of 1 to 5 with 1 = *Strongly Agree*; 2 = *Agree*; 3 = *Neither agree nor disagree*; 4 = *Disagree*; and 5 = *Strongly Disagree.*
The Hierarchical Thinking scale consists of items 3, 6, 7, 8, 10, 13, 15, 16, 17, 21, 22, 25, 27, and 28. The remaining items make up the Systemic Thinking scale.

TABLE 6.

Developmental Activities That Showed Statistically Significant Differences on the Systemic Thinking and Hierarchical Thinking Scales

	Hierarchical Thinking			Systemic Thinking		
Activity	***t***	***p***	**ES[a]**	***t***	***p***	**ES[a]**
Studied abroad for a semester	2.27	.024	.32	2.19	.029	.31
Attend one cultural event per week	*ns*	—	—	2.77	.006	.32
Volunteer with a service organization	3.26	.001	.28	3.67	.000	.31
Participate in a creative art	2.04	.042	.17	3.68	.000	.31
Place materials for recycling	*ns*	—	—	2.45	.015	.30
Member of athletic team	2.69	.007	.26	*ns*	—	—
Make entries in personal journal	*ns*	—	—	2.86	.004	.28

[a] Effect Size

The Hierarchical Thinking scale consists of 14 items that suggest organizations should be organized in a stable hierarchical manner with power and control focused in the upper levels of the hierarchy. This style of thinking is characterized by a belief that control and authority extend downward in the hierarchy and that organizational members should seek guidance from the level above them. The mean of this 14-item scale (42.33) was almost precisely in the middle of the expected range of scores (14 to 70) and the standard deviation (7.33) indicated that scores were spread out over a wide range. Visual inspection of the frequency distribution indicated that it was very close to normal.

The Systemic Thinking scale consists of 14 items reflecting an ability to relate a variety of ideas and concepts to organizational success. Thus, this style of thinking is characterized by being able to relate organizational success to the complex interaction of a number of factors. The mean of this scale (27.41) was at the low end of the range, indicating a high degree of agreement with this style of thinking, at least in the current sample. The standard deviation (6.55) was also relatively low. Visual inspection of the frequency distribution indicated a positive skew and a strong tendency among most individuals to endorse the concepts of systemic thinking as defined by this scale. Both scales have excellent reliability, as indicated by coefficient alpha, and preliminary evidence also supports their validity.

Interestingly, items representing Hierarchical and Systemic thinking coalesced into independent factors instead of a single, bipolar factor as could be expected. The correlation between these two scales was .022, indicating that they are clearly independent dimensions. Furthermore, individuals could be placed into at least four categories (e.g., High Systemic-High Hierarchical; High Systemic-Low Hierarchical; Low Systemic-High Hierarchical; Low Systemic-Low Hierarchical) based upon responses to the two scales. More categories could be created by dividing each scale into three or more levels.

Other studies and reviews have examined the factor structure of leadership measures. Bass (1990, p. 520) has developed the most comprehensive model. Bass's model is a multilevel structure that begins with a two-factor model and

proceeds to add successive levels showing the interrelationship of factors at the various levels. At the two-factor level are Consideration and Structuring. Consideration is then divided into subfactors such as supporting, delegating, responding with flexibility, and sharing information. Structuring is divided into subfactors such as supervision, clarification of goals, emphasizing production, enforcing rules and procedures, and negotiating. Consideration in this model seems to have much in common with the Systemic Thinking scale of the LABS-III. However, the Systemic Thinking scale adds elements such as ethics, environmental preservation, cooperation, personal responsibility, learning, and an orientation toward the future, which are not included in Bass's model. Similarly, the Structuring factor in Bass's model seems to have a lot in common with the Hierarchical Thinking scale of the LABS-III. However, the latter scale includes dependence upon positional leaders, which is not among the subfactors of Structuring. Thus, the current model seems to be broader in scope than Bass's model. Relationships between the LABS-III and other leadership measures remains an empirical issue for future research.

Another issue for future research would be to determine what degree of success is experienced by organizations and organizational members as a function of their scores on the Hierarchical and Systemic Thinking scales. According to the theory proposed by Allen et al. (1998), organizations with a low number of systemic thinkers or individuals low in systemic thinking are likely to be the least adaptive and successful. On the other hand, individuals high in systemic thinking or organizations with a substantial number of systemic thinkers should be more adaptive and successful. At the same time, individuals high in hierarchical thinking and low in systemic thinking in leadership positions have the potential to do considerable damage to organizations because they are least likely to be concerned with the complexities faced by all organizations ranging from adaptive challenges and changing markets to ethics and a sustainable future. Furthermore, such individuals would not be likely to seek information about these issues and how to deal with them from other members of the organization.

On the other hand, individuals scoring low on the Hierarchical Thinking scale and high on the Systemic Thinking scale are the most likely to make themselves aware of the forces that have the potential to impact the organization. Furthermore, they would be least likely to see themselves or positional leaders in the organization as having the capability of single-handedly making all the key organizational decisions. Such an individual might be very successful in a leadership position by emphasizing cooperative methods of making key decisions and being open to new information about potential feedback loops that may have an impact on the organization.

Another important empirical issue is whether organizations (as opposed to the people in them, as in the current study) can be described in a similar manner that is consistent with the leadership theory by Allen et al. (1998). One could then speculate that certain organizations would be a better match for the individual's own beliefs about leadership processes as measured by the LABS-III.

Table 6 shows the relationship between various activities and experiences of college students and differences on the Hierarchical and Systemic Thinking scales. Two activities showing moderate effect sizes were attending cultural events and volunteering with a service organization. This would be consistent with other findings (e.g., Astin & Sax, 1998) regarding the development of college students. Research about whether these kinds of experiences actually influence a person's thinking style or whether individuals with such thinking styles are more likely to engage in such activities would be useful. Given the kinds of intellectual changes that may occur during the college years, the experiences likely influence thinking styles rather than the reverse.

In sum, the current research indicates that individuals think about leadership processes along two uncorrelated dimensions that were labeled Hierarchical Thinking and Systemic Thinking. Many of the frustrations that organizational members experience are likely to arise from its hierarchical nature and the hierarchical

thinking of those in leadership positions. However, individuals who tend to think hierarchically about organizations may be quite comfortable in organizations dominated by hierarchical thinkers by making a career goal of rising higher and higher in the organization. On the other hand, individuals who believe that leadership processes need to be systemic may be frustrated in their attempts to point out the feedback loops that need attention when positional leaders only look to the leadership hierarchy for such information. According to Allen et al. (1998), organizations dominated by hierarchical thinking will not be as adaptable as those which have a preponderance of systemic thinkers. These are empirical issues that the LABS-III may assist in resolving.

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