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The *Dimensions of Leadership Profile*®

Research Report

The *Dimensions of Leadership Profile*®
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Dimensions of Leadership Profile® Research Report

This report includes information on the development of the *Dimensions of Leadership Profile*® and the theoretical background on which it is based.

Goals and Objectives

The purposes of the *Dimensions of Leadership Profile* are several:

- To reflect on what leadership means at the turn of the century, having seen major changes in how organizations are led and how people work together to produce results.
- To understand leadership independent of what we know about management—on the assumption that leadership occurs in relation to followers, not as an exercise of authority.
- To focus on what we can learn from followers about leadership.
- To remove the mystique from leadership and relate it to what a wide variety of people are capable of doing.
- To describe leadership by beginning at the level of observation and to ask "What do leaders do when they lead?"
- To capitalize on well-done observational studies already completed.
- To apply a method of analysis that has not been used, or used infrequently, to analyze the concept.

The purpose of the last objective was to increase the likelihood of uncovering new insights, by using methods that limit the analysis process less than those used traditionally. In psychometric terms, configural methods of analysis were used to uncover meaningful nonlinear relationships that linear methods (e.g., correlation, multiple regression, factor analysis) may fail to reveal or treat as error.

Development of the Instrument

Selection of Content. To obtain a base of information for analysis, recent books and articles on leadership theory and experience were read carefully. They were authored by people schooled in academia and experienced in leading, studying leadership, and consulting with leaders throughout America and abroad. Additional books and articles were scanned to determine whether references adequately addressed all aspects of the concept. From detailed notes on materials read, over 500 descriptive phrases were identified. These were organized by topic, and a representative sample of 144 phrases or items was retained. Item selection was based on the followed criteria:

- few words needed

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- clarity of statement
- representative of the concept domain

Each item was printed on a three-by-five-inch card. Cards were sorted randomly, except where two or more cards had to be presented in sequence for ease in understanding. For example, the two statements "Focus on what should be done" and "Focus on getting things done" were presented consecutively, to help the respondent note the difference. The large number of cards presented, a total of 144, made it appropriate to assist the respondent in a limited way without biasing responses significantly.

Data Gathering Method

Each set of 144 cards was placed in a recipe box along with a page of instructions and a page of demographic questions. Cards were presented in the same order in each box. Each "kit" was delivered to each of forty-four respondents, selected to represent (a) a variety of individuals—managers and non-managers, various careers, gender and culture diversity; and (b) persons capable of completing the rather challenging sorting tasks they were instructed to do. All forty-four boxes were returned with the task completed.

Respondents did two things with their set of 144 cards. First they sorted them into piles of cards that described the same ideas or theme, as they saw it. Then they assigned the piles to a place on an Importance Scale of 1 to 10, to indicate how meaningful the phrase was for describing their concept of leadership. Ties were permitted. In this way, a categorical measure of item Similarity was obtained along with a scaled measure of item Importance. Both measures were needed for the analyses that followed.

A card sort of this type is used frequently in the field of cognitive social psychology to measure perceptions of people and objects. The author of the *Dimensions of Leadership Profile*® has used it successfully to measure the values of managers, and the method has been used by other researchers to measure predictions and explain business outcomes. Its primary purpose is to learn what people think about a subject beyond what they can immediately say about it. The method draws out more definitive information than is typically obtained with a questionnaire or interview.

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Analysis

Item Grouping

One task of analysis was to determine which combinations of statements describe dimensions of leadership and how many different dimensions should be used. Empirical cluster analysis using three hierarchical methods was applied to item Importance ratings. Items were assigned to a cluster based on the following criteria:

- Measure of "goodness of fit" was acceptable by usual psychometric standards.
- At least two of three solutions assigned a pair of items to the same cluster.
- The same number of clusters emerged in two or three solutions.

Analysis at this stage yielded twelve clusters, with from seven to eighteen items in a cluster. Inspection of the multidimensional model described below helped verify the assignment of items to clusters.

Model

Another task was to determine how various dimensions were related. For this purpose a statistical analysis method was used that starts with few assumptions about what the model should look like. This means the model that emerges largely represents the actual relationship of leadership concepts and not results imposed on it by the method of analysis. The procedure is called multi-dimensional scaling (MDS). In this case, an ordinal solution produced the best representation of the data.

The MDS model is a configuration of data points plotted on two or more bipolar dimensions. Several measures of fit help determine whether a two-, three-, or higher- dimensional solution is needed to represent the data. In the present case, two bipolar dimensions were sufficient. Data points were arranged in a round pattern, and the two bipolar dimensions intersected each other at the middle.

When items located near each other in the two-dimension array were identified, it was apparent they were grouped in much the same way as in the item cluster analysis. The pattern in the array suggested a wheel, and the position of each item cluster indicated where around the wheel a particular scale of items should be placed.

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Thus, the Leadership Wheel in the *Dimensions of Leadership Profile*® is based on empirical findings rather than theoretical assumptions about the nature of leadership. However, once the wheel is identified, it is easy to find confirmation of it in the literature on leadership and in everyday references to the behavior of leaders.

For example, the discussion of the need for both "head" and "heart" in leading refers to both ends of the horizontal dimension—to the intellectual and social roles of leadership. Followers in a study by Kouzes and Posner (1987) described their expectations of leaders as involving Character (honest, trustworthy, truthful, ethical-principled) as well as Accomplishment (solves our problems, meets our needs) and Interaction (reflects back what people most desire, understands others' yearnings) along with Analysis (is forward-looking, sees what others cannot see, has a well-defined goal). These characteristics of leadership closely match the dimensional structure of the *Dimensions of Leadership Profile*.

Cross-Validation

To determine whether the model of leadership represented by the Dimensions of Leadership Profile is replicable (i.e., will appear when the research is repeated on another sample), a second sample of 21 people were asked to complete the 144-card sort and Importance ratings that yielded the original model. Because results obtained in the second study were so close to those obtained in the first, responses of both samples of subjects were combined in preparing Version 2.0.

The demographic characteristics of the combined research sample are shown in Table 1.

Table 1. Characteristics of the research sample (N=65):

Supervisory Experience	N	Percent	Level of Education	N	Percent
None	3	5	High School	2	3
<3 years	14	22	Some post-H.S.	3	5
3 to 5 years	7	11	Baccalaureate	15	23
6 to 10 years	16	25	Some post-college	16	25
11 to 20 years	20	31	Master's degree	14	22
>20 years	5	8	Terminal prof. degree	15	23
Gender	**N**	**Percent**	**Education Major**	**N**	**Percent**
Female	28	43	Liberal Arts[1]	19	29
Male	37	57	Professional/Technical[2]	13	20
			Business/Economics	25	38
Age	**N**	**Percent**			
Under 20	0	0	**Present Occupation**	**N**	**Percent**
20 - 29	9	14	Non-Management	13	20
30 to 39	12	18	Professional	19	29
40 to 49	26	40	Prof/Managerial	16	25
50 to 59	12	18	Business Manager	14	22
60 or over	4				

[1]e.g., political science, English, math, psychology

[2]e.g., law, architecture, theology, medicine

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Research participants were well-educated and employed generally in higher-level positions. The modal age category was 40 to 49. They were selected, in part, for their perceived ability to complete a difficult research task and form concepts about leadership. This factor does not detract from the validity of the model. On the contrary, since participants represent a variety of ages, educational levels, specializations, and occupations, they are a superior group on which to base generalizations compared to the typical research pool of college students.

Development of the Items

The sixty items present in the Version 2.0 Profile were selected to meet the following criteria:

- Each set of five items demonstrated higher inter-item correlation.
- Intercorrelations between sets were relatively low (values between -.25 and +.30, with most between +/-.15).
- On its face, each set appeared to represent distinct characteristics. This assumption was tested with a pilot group of respondents.

The section below labeled Technical Information contains additional information on the statistical properties of the instrument.

Having developed and replicated the model on which the *Dimensions of Leadership Profile*® is based, an important next step was to examine responses to the instrument from actual users. Items on the *Dimensions of Leadership Profile* were initially presented in a "most" – "least" response format with four items to a set. Based on further psychometric analysis and user reaction, Version 2.0 was revised to include five items in a set, and respondents were instructed to rank all options from 1 to 5. Changes in response format did not appreciably improve intra-scale reliabilities overall, but they did improve the ease of response.

Technical Information

Any new instrument needs to demonstrate that it is measuring what it intends to measure. The first step is to establish that items on a scale relate more to each other than to items on other scales. In this way one establishes the unitary property of a scale. The measurement of this property is called internal consistency reliability, and the statistic customarily used is Cronbach's *alpha* coefficient.

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Reliability

Alpha is an estimate of how well items on a particular measure relate to all other potential items in the universe of items that could be used to measure a particular trait. When the number of items in the instrument is small, an adjustment is applied called the Spearman-Brown formula that corrects for the underestimate generally represented by alpha. The objective is to obtain as accurate an estimate of internal consistency reliability as one can using available items.

When scales are related to each other, another important measure is obtained. The degree to which two scales are measuring the same trait is represented by the coefficient of correlation, $r_{xy.}$ Since the goal is to create unitary scales, each of which measures a *different* trait, one looks for *low* correlations between *scales* and *high* correlations between items within a scale.

This objective is seldom achieved in multi-dimensional instruments, because human behaviors tend to be interrelated. Therefore a useful guideline for determining whether an instrument meets the criterion, is to observe whether reliabilities (i.e., measures of the internal consistency within a scale) are significantly higher than correlations between scales. When these statistics are examined for responses on Version 2.0 of the *Leadership Profile*, results shown in Table 2, on the next page, are found.

To establish the psychometric properties of Version 2.0, two samples of people (N=48 and N=187) were asked to complete the Response Page of the new instrument. They were generally younger overall than members of other research and development groups. But they reported similar high levels of education (26% were college graduates and 64% has post-baccalaureate education) and were employed primarily in service industries. Five percent of this combined group were minorities, and a disproportionate number were men (about two-thirds). Results from both groups are combined in Table 2. Reliability coefficients are adjusted by the Spearman-Brown formula, to offset the underestimate of reliability obtained on short scales.

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Table 2. Comparison of reliability coefficients with rank-order correlations among scales (N=231).

	ENTH	INTE	SELF	FORT	PERC	JUDG	PERF	BOLD	TEAM	COLL	INSP	SERV
Enthusiasm	**.83**											
Integrity	-.02	**.80**										
Self-Renewal	-.08	.17	**.61**									
Fortitude	-.09	-.33	-.01	**.73**								
Perceiving	-.42	-.31	-.06	.15	**.72**							
Judgment	-.29	-.29	.17	.25	.38	**.75**						
Performance	-.38	-.25	-.23	.16	.33	.27	**.76**					
Boldness	-.36	-.24	-.16	.19	.24	.23	.38	**.68**				
Team Building	.17	-.09	-.24	-.32	-.30	-.36	-.16	-.23	**.65**			
Collaborating	.04	.17	-.21	-.31	-.26	-.48	-.27	-.41	.20	**.66**		
Inspiring	.25	-.07	-.35	-.22	-.27	-.38	-.32	-.24	.24	.27	**.78**	
Serving Others	.24	.20	-.01	-.40	-.50	-.42	-.42	-.31	.14	.21	.16	**.86**

Focus on Character

Focus on Analysis

Focus on Accomplishment

Focus on Interaction

Note: Reliability coefficients are in bold along the diagonal. Figures within each triangle display correlations for scales associated with a single focus of attention.

Table 2 demonstrates that a considerable degree of independence exists for each of the twelve Dimensions of Leadership. It also shows that the amount of correlation among dimensions associated with a particular Focus of Attention is no greater, by and large, than the correlations between these dimensions and other dimensions in the wheel. For example, the rank-order correlation between two expressions of Analysis—Judgment and Perceiving—is .38; however, the correlation between Perceiving and Performance is .33 and the between Perceiving and Boldness is .24. The correlation between Perceiving and Fortitude, both Analysis dimensions, is only .15.

The use of rank-order or forced-choice response format generally produces a number of negative inter-scale correlations, because the respondent must both endorse and reject options using this format. The more consistently someone endorses one scale and rejects another, the more negative is the measure of association.

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As indicated on the previous page, it is important to demonstrate that scale reliabilities (numbers on the diagonal of Table 2) are consistently higher than other figures in the same row and column. For example, one observes an alpha coefficient of .75 for Judgment in the middle of the table. Moving to the left and down from this entry, one sees correlations of -.48 to .38. None of them are close to the reliability coefficient of .75 in absolute value. In this manner, the entries demonstrate that the items associated with Judgment are more clearly related to what Judgment measures than to any other dimension. The lower alpha coefficient in the table is for Self Renewal at .61. However, when the row and column associated with this figure are examined, inter-scale correlations of -.35 to .17 are observed. Here, too, the difference is confirmatory. The reliability isn't as high as one would like for Self Renewal, but the items on this scale are measuring self renewal more than any other characteristic. Similar differentiations hold for all dimensions in the instrument.

One of the two studies of Version 2.0 captured participants' Response Focus for analysis. The number of respondents in each class is not large enough to support definitive conclusions. However, trends suggest possibilities for further follow up. A hypothesis is that responses will be more reliable when the focus is on someone else than when the focus is on oneself. This notion is supported by the assumption that people have a clearer image of another person than they have of themselves. Self image is a combination, we are told, of how I would like others to see me, how I see myself, and other sources of possible ambivalence in responding.

When a second, larger sample of respondents was divided into those who focused on themselves (N=45) and those who focused on someone else (N=98), only two significant differences were observed. The "Myself" respondents were more reliable in reporting on Self Renewal than "Other" respondents. "Other" respondents were much more reliable in reporting on Inspiring. It is credible that individuals are more aware of and therefore more definitive in describing their own commitment to self-renewal; while self renewal, being a fairly private undertaking, is not very visible to others. It is also not surprising that others are more consistent in describing a person's inspiring behavior, since that is something they can best appraise. An individual in describing himself or herself is in a more difficult position, since inspiration is in the heart of the follower. Overall, however, the hypothesis that Self reports would be less reliable than Other reports was not confirmed.

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Separate observations have suggested that people in management or senior staff positions report more reliably in a test-retest measure than those in lower positions in an organization. Thus, another comparison may be made between professional and supervisory participants and participants in administrative –clerical positions, skilled labor, and sales. When the combined samples were broken into these two categories (professional/supervisory N=142, others N=89), the average reliability coefficient for professional/supervisory respondents was .06 greater than the other group—not a significant difference, considering the small sample size. However, when supervisors and managers who focused on themselves were singled out (N=22), the reliabilities increased dramatically. The same result was not obtained for supervisors and managers focusing on someone else.

This last finding, together with information on a small sample of test-retest reliabilities ($r_{xx'}$=.55 to .98, mean=.73, N=18), suggests that persons experienced in a formal leadership role may have an easier time conceiving of themselves as leaders and may do so with greater reliability than they or anyone else conceives of someone else in a leadership role. If this is the case, it suggests the *Dimensions of Leadership Profile*® should be administered after participants have had an introduction to leadership using this model (particularly to the Focus of Attention and *Dimensions of Leadership* Wheel), to ensure that more reliable and therefore more valid representations are obtained.

Validity

Another important consideration in developing a behavioral measurement instrument is to demonstrate its validity. The method of development established the content validity of *Dimensions of Leadership Profile* by representing the broad definitions of leadership behavior offered by a variety of qualified observers. An informal check on content validity is to note whenever people describe what leadership means to them, whether they are describing behavior represented in the Profile. The Uniform Guidelines for psychological tests accept content validity as a sufficient form of validation for test acceptance. However, research will continue to further explore the meaning of the leadership constructs represented in the instrument.

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The most persuasive support for the instrument's validity is the ability to replicate the model with an independent sample of subjects. Further support, albeit untested, is offered in Bass's (1985) typology for transformational leadership. When the opportunity arrives, it will be worthwhile to correlate his measure with the *Dimensions of Leadership Profile*®, to determine the degree of association or empirical validity between two measures of similar leadership characteristics. Finally, the content of the Dimensions of Leadership Profile is similar to the content of the Leadership Survey of the Baseline Series authored by Bruce Knudson. On the face of it, this similarity adds content validity to each instrument.

The interpretations included in the present version of the *Dimensions of Leadership Profile* are based on reported experiences of leaders and followers who display or are attracted to the dimensions of leadership measured in the *Profile*. And they are further supported by information obtained in the second development study on rewards associated with preferred leadership characteristics. Only information supported by the author's research and that published by others is included. Dimensional interpretations were introduced and refined by the author with several groups who responded warmly to them and found them valuable.

As we learn more about this model of leadership and its relation to experiences in various contexts, we will share that information with the user. We also welcome the experiences and insights of those who apply the instrument.

Summary

The *Dimensions of Leadership Profile* offers a new way of looking at leadership that serves modern-day needs to recognize leadership potential in all members of a group or organization. It has been developed empirically, based on observations about the behavior of leaders chosen by followers.

The model for the instrument has been replicated in two independent development samples, and the twelve dimensions it offers are established as independent and reliable measure of leadership characteristics.

Based on several stages of research, scales have been refined and the presentation and interpretation enhanced, so the *Dimensions of Leadership Profile* in its present form can serve as a valuable tool for enabling both managers and non-managers to identify and develop their own leadership potential and support the contributions they identify in others.

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