LEADERSHIP SKILLS FOR A CHANGING WORLD: SOLVING COMPLEX SOCIAL PROBLEMS

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Leadership has traditionally been seen as a distinctly interpersonal phenomenon demonstrated in the interactions between leaders and subordinates. The theory of leadership presented in this article proposes that effective leadership behavior fundamentally depends upon the leader's ability to solve the kinds of complex social problems that arise in organizations. The skills that make this type of complex social problem solving possible are discussed. The differential characteristics and career experiences likely to influence the development of these skills also are considered along with the implications of these observations for leadership theory and for the career development of organizational leaders.

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INTRODUCTION

> Continual change and the need to respond to it compels the Commander to carry the whole apparatus of his knowledge with him. He must always be ready to bring forth the appropriate decision by total assimilation of his mind and life. The Commander's knowledge must be transformed into general capability (Von Clausewitz, 1984, p. 147).

In this quote, Von Clausewitz states a fundamental issue that must be addressed in any attempt to develop a truly comprehensive theory of leadership. Few of us would dispute the point that leaders exercise influence, taking actions that, in one way or another, shape the behavior of others (Bass, 1990; Fleishman, 1973, 1998; Yukl, 1994). However, it is not enough for leaders to exercise influence, however important this influence may be to perceptions of leadership (Hall & Lord, 1995). Certainly, people in the Gulag would not question whether Stalin influenced their lives. However, it is open to question, given the long-term consequences of his actions for Russia, whether Stalin was an effective leader. Leaders must not only exercise influence, they must decide when, where, and how influence will be exercised to bring about the attainment of social goals (House & Howell, 1992; Mumford, 1986; Winter, 1991).

The importance of effective leadership has not been lost on students of leadership. Over the years, many theories have been proposed describing the kinds of behaviors that make effective leadership possible—theories of behavioral styles (Lindell & Rosenqvist, 1992), tranformational or charismatic leadership (Bass & Avolio, 1994; Klein & House, 1995) and leader-member exchange (Graen & Uhl-Bien, 1995). These theories all have in common a focus on certain behavior patterns and the implications of these patterns for leader performance. In contrast, however, leadership can be framed not in terms of specific behaviors, but instead in terms of the capabilities, knowledge, and skills that make effective leadership possible.

Although capability models have not been widely applied in studies of leadership, they have been used in a number of other areas, ranging from the design of educational interventions (Halpern, 1984) to the description of work force requirements (Peterson, Mumford, Borman, Jeanneret, & Fleishman, 1999). Capability models (i.e., theories examining the knowledge and skills held to underlie effective performance) have contributed to the design of new assessment and developmental interventions. They have also proved particularly useful in describing the basis for effective action within unstable or changing environments (Cascio, 1995). This article describes a capability model for understanding leader performance in organizational settings, considering both skill and knowledge requirements, as well as the development and expression of those capabilities over the course of leaders' careers.

Organizations and Problems

Attempts to develop models of the skills and knowledge required for effective performance typically begin with an analysis of the demands being made on people working in a certain arena (Fleishman & Quaintance, 1984; Mumford & Peterson, 1999). Thus, to develop a model of the capabilities underlying effective organiza-

tional leadership, one must identify the performance requirements imposed on organizational leaders. These requirements are succinctly described by Hackman and Walton (1986, p. 25) who state that the leader's

> main job is to do, or get done, whatever is not being adequately handled for group needs (McGrath, 1962, p. 5). If a leader manages, by whatever means, to ensure that all functions critical to both task accomplishment and group maintenance are adequately taken care of, then the leader has done his or her job well.

This description of leader performance, however, poses another, somewhat deeper question. What must the leader do to facilitate group maintenance and task accomplishment? To answer this question, one must consider the problems confronting organizational leaders as they attempt to manage people and their work. Although a number of models have been proposed that might be used to understand organizational behavior (Pfeffer & Salancik, 1978), socio-technical systems theory represents a widely accepted model, one that has proven useful in accounting for a variety of organizational phenomena, including cycles of growth and change (Tushman & Anderson, 1986), culture (Schneider & Schneider, 1994), and reactions to innovation (Bryan, 1988; Burns & Stalker, 1961). Systems theory defines an organization as a collection of subsystems that operate together to provide products and meet the goals of various constituencies using a socio-technical transformation process (Katz & Kahn, 1978). This transformation process is based on the division of labor and available technology. Maintaining this process requires organizations to extract resources from the surrounding environment and produce products that are likely to attract investment. While this seems quite straightforward, systems theory points to three rather fundamental contradictions of organizational life.

First, organizations must balance the *tendency toward stability*, brought about by prior investments, interdependencies among systems, and people's habits, with the *need for change* to cope with shifts in the environment, technology, and available resources. Second, although they might work together to bring about products or services, the loosely linked subsystems that comprise organizations may not agree on goals or strategies for coping with changes. Third, organizations must not only cope with objective performance demands and the bottom line, they must recognize the unique needs of the people who comprise the subsystems.

Environmental change, subsystem differences, and the diversity of human beings result in organizational contexts defined by complexity, conflict, and dynamism. Under these conditions, end goals and paths to goal attainment are, at best, uncertain. To survive and prosper, organizations must control conflict, position themselves to adjust to change, and choose the best paths to goal attainment. Accordingly, organizational leaders who are tasked with maintaining organizational viability must search for goals and paths to goal attainment that will maintain the organization and ensure that the work gets done. Thus, a leader's performance is a function of whether he or she can identify goals, construct viable goal paths, and direct others along these paths in a volatile, changing socio-technical environment (Mumford &

Connelly, 1991). Leaders must not only be able to define departmental, unit or organizational missions, they must be able to coordinate the activities of others motivating them to meet mission requirements. Additionally, they must circumvent or resolve issues impeding progress towards accomplishing organizational goals. Selection and implementation of actions to bring about goal attainment represents a form of problem solving making the generation, evaluation, and implementation of proactive and reactive solutions key to leader effectiveness.

Leadership Problems

The statement that organizational leadership involves problem solving should not be taken to imply that leadership is the equivalent of performance on the Scholastic Achievement Test. Leadership instead represents a complex form of *social* problem solving. One way leadership problems differ from more routine problems is that the complexity, conflict, and change characterizing organizations ensure that leaders are presented with ill-defined problems (Fleishman, Mumford, Zaccaro, Levin, Korotkin, & Hein, 1991; Mumford & Connelly, 1991). Ill-defined problems lack a single solution path—right answer or wrong answer—allowing the problem to be construed in a number of different ways (Fredericksen, 1984; Runco, 1994). As Amabile (1997) points out, one of the central issues leaders must address, particularly entrepreneurs, is defining exactly what the problem is in the first place.

Not only is it difficult in many organizational settings for leaders to say exactly what the problem is, it may not be clear exactly what information should be brought to bear on the problem. There is a plethora of available information in complex organizational systems, only some of which is relevant to the problem. Further, it may be difficult to obtain accurate, timely information and identify key diagnostic information. As a result, leaders must actively seek and carefully evaluate information bearing on potential problems and goal attainment (Komaki, Desselles, & Bowman, 1989; Voss, Wolfe, Lawrence, & Engle, 1991).

Still another way leadership problems differ from more routine kinds of problems is that they tend to be novel. Many routine managerial problems, business projections for example, do not represent especially novel problems to experienced managers (Nutt, 1984). These routine organizational issues do not call for exceptional leadership. Leadership, however, becomes more crucial when one must develop and guide adaptive responses to new or changing situations. As Hackman and Walton (1986) and Tushman and Anderson (1986) point out, when groups must deal with novel problem scenarios, leadership is likely to have its greatest impact on organizational performance.

Complexity, novelty, and information ambiguity define one set of attributes that set apart leaders' problem solving efforts. It is important to remember that leaders solve problems in "real-world" settings where time is short, and demands are many. As a result, leaders typically do not have the luxury of analytically working through all options attached to a problem (Lord & Maher, 1990). Instead, they must often generate solutions to multiple, rapidly unfolding problems, using short-cuts and applying general models (Mintzberg, 1973, 1975, 1994; Wagner, 1991). Solutions may often be extemporaneous, involving interactions among multiple different problems as they unfold over time in a dynamic system.

Moreover, in organizations it is often far more important to have a workable solution at the right time than one truly best solution. One implication of this observation is that leaders attend to restrictions imposed by time frame, resources, system demands, conflicting goals, and conflicting problems in generating and implementing potential solutions (Schor, 1983). Determining how to work within these restrictions may, in fact, represent the most common manifestation of leader innovation. In organizations, however, feasibility is not simply a matter of attending to constraints. Leaders must also attend to potential negative consequences of a solution with respect to other ongoing problem-solving efforts and broader system goals (Mumford & Peterson, 1999). Solutions inconsistent with broader goals and policies, or solutions associated with negative downstream consequences must be rejected as unworkable (Wagner, 1991). Given these system concerns and the pressures, it is not surprising that leaders often evaluate problem significance and solution feasibility before starting work (McCall & Kaplan, 1985).

From a leader's perspective, organizational constituencies and stakeholders pose significant potential restrictions. Thus, leaders' solutions must be built upon consensus which implies a broader point. Leaders must develop and implement solutions in a distinctly social context. Solutions are often developed interactively or with the help of key subordinates, peers, and supervisors (House, 1996; Howard, 1995). The need to develop and implement solutions with and through others places a premium on social skills (Zaccaro, Gilbert, Thor, & Mumford, 1991), especially skills used in acquiring information, framing actions, and promoting coherent actions on the part of the group. In this sense, it is clear that communication of a shared vision and flexibility in implementation may represent necessary components of effective problem solving in organizations.

LEADERSHIP SKILLS

These observations about the nature of leaders' problem-solving efforts are of some interest in their own right. With respect to understanding effective leadership in organizational settings, however, the nature of the problems at hand and their associated performance demands have another noteworthy set of implications. Specifically, they provide us with some important clues about the kinds of knowledge and skills likely to underlie effective performance in organizational settings.

Figure 1 presents an overview of the key kinds of capabilities, knowledge and skills brought to bear in leaders' problem-solving efforts. This model posits that leaders begin to address complex organizational issues by defining the problem and formulating a solution framework or set of ideas that might be used to understand the problem and develop initial solution strategies. In this phase, leaders, sometimes with the help of others, focus primarily on the problem, its significance, origins, and potential solutions. Although the focus at this point is on the problem, it is important to recognize that experience, knowledge of the job, and the nature of the organizational environment and the leader's understanding of it shapes the way leaders represent the problem, the kinds of information they look for, and the type of concepts being applied (Mumford, Whetzel, & Reiter-Palmon, 1997).

Leaders cannot assume work is done when they have formulated an initial

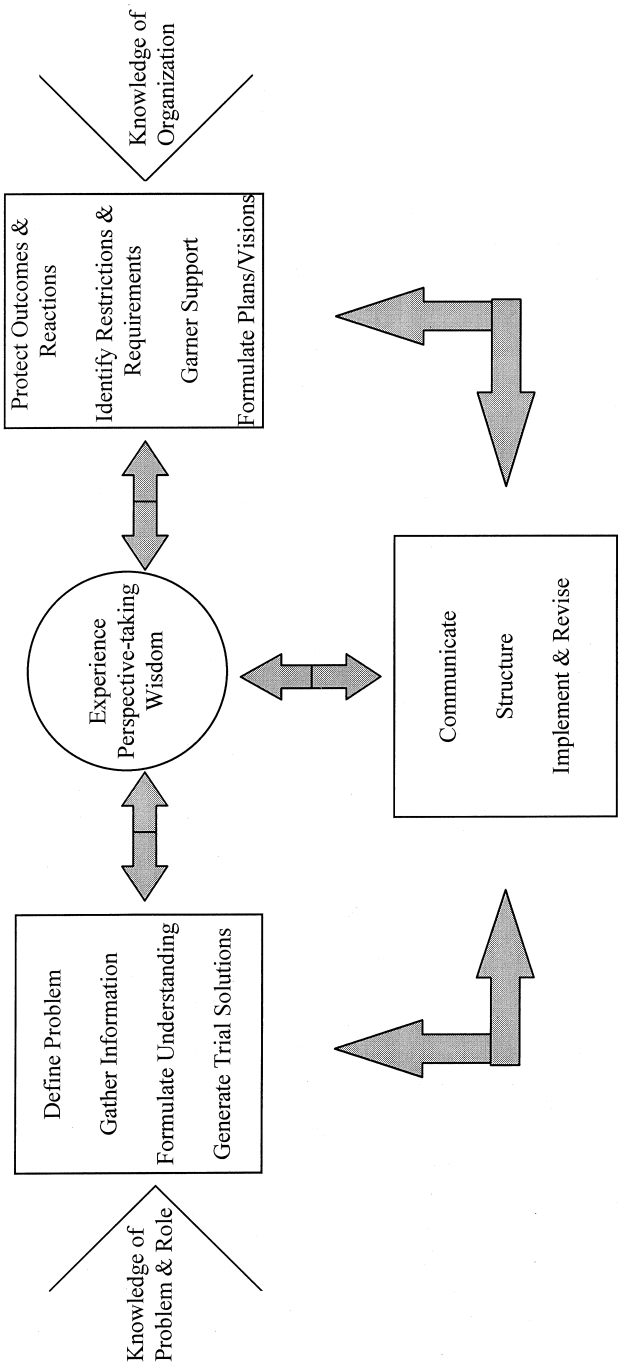

Figure 1. Model of Leader Problem Solving

solution approach to the problem. Capabilities such as wisdom and perspective-taking enable leaders to "go outside themselves" to assess how others react to a solution, identify restrictions, develop plans, and build support for implementation. At times, restrictions, lack of effort, or the failure to find a viable plan of action, may dictate new cycles of problem-focused cognition. In other cases, this organizational cognition leads to a refinement of initial solution frameworks that permits effective problem solving within the context of ongoing organizational activities. Accordingly, a knowledge of the organization, key constituencies and operational requirements appear to be important influences on performance during this phase of problem solving.

Ultimately, performance depends on implementation of a plan. Implementation, however, occurs in a distinctly social context, where the leader depends on the efforts of others in implementing proposed solutions. Thus, social cognition is also required. One important requirement during the social implementation phase is a knowledge of subordinates, peers, and superiors, people the leader is interacting with during solution implementation. The leader must be able to communicate vision, establish goals, monitor progress, and motivate subordinates as they attempt to implement a given solution plan. This requires flexibility in dealing with others and in adjusting plans opportunistically, as dictated by the demands of a changing social environment (Hayes-Roth & Hayes-Roth, 1979; Zaccaro, 1996; Zaccaro, Gilbert, Thor, & Mumford, 1991).

With regard to this general model of leaders' problem-solving efforts, three points should be borne in mind. First, although problem-focused, organizational, and social cognition can be viewed as distinct phases, in "real world" settings, all three phases may interact in a dynamic and cyclical fashion. For example, implementation issues such as subordinate motivation may trigger new cycles of problem-focused cognition. Second, within this model, leadership is viewed as a highly complex phenomenon involving multiple forms of cognition. Third, although this model recognizes the importance of the social informational capacities traditionally held to define leadership, it also indicates that effective leadership depends upon an underlying bedrock of problem-focused and organizational cognition—topics that have received scant attention in the literature.

Creative Problem Solving

In problem-focused cognition, leaders are attempting to solve novel, ill-defined problems. Novel, ill-defined problems cannot be solved simply through the routine applications of extant knowledge (Baughman & Mumford, 1995). Instead, relevant knowledge, particularly representations derived from prior experience and knowledge of one's job, must be reshaped and reformed to generate new solutions. These observations, in turn, suggest that the skills involved in creative problem solving influence leader performance.

Traditionally, organizational leaders, despite the manifest creativity of such notables as Henry Ford and Robert E. Lee, have not been viewed as particularly creative people (Torrance, 1971; Whyte, 1956). The available evidence, however, indicates that creative problem-solving skills may indeed represent an important influence

on leader performance. Studies by Bray, Campbell, and Grant (1974), Chusmir and Koberg (1986), DeVeau (1976), Howard and Bray (1988), Rusmore (1984), and Sinetar (1985) all indicate that measures of divergent thinking skills are positively correlated with leader performance. More recent work by Guastello (1995) has shown that idea generation is related to emerging leadership, while Mumford and Peterson (1999) found that across industries, high levels of creative problem-solving skills were required on upper level managerial jobs.

Over the years, a number of scholars have proposed models describing the key cognitive skills involved in creative problem solving (e.g., Finke, Ward, & Smith, 1992; Isaksen & Parnes, 1985; Merrifield, Guilford, Christensen, & Frick, 1962; Mumford, Mobley, Uhlman, Reiter-Palmon, & Doares, 1991). Typically, those models assume that creative problem solving involves a complex set of skills beginning with problem construction, where the selection and screening of knowledge representations derived from past experience is used to define the nature of the problem structure, structure information search, and select concept relevant concepts (Davidson, 1995; Mumford & Gustafson, in press; Perkins, 1992; Runco, 1994). Based on this information, existing concepts are restructured or reorganized to provide the new understandings that serve as the basis for generating alternative solutions, evaluating the merits of these alternatives, and constructing an initial implementation plan (Finke et al., 1992; Runco & Chand, 1994).

The evidence accrued in these and a number of other studies, indicate that these skills represent unique capacities reflecting something above and beyond general intelligence (Okuda, Runco, & Berger, 1991; Sternberg & Lubart, 1991). For example, in one series of studies, Mumford, Baughman, Supinski, Costanza, and Threlfall (1993) found that performance on a set of ill-defined management problems depended on (1) the identification of viable procedures during problem construction; (2) the capacity to identify key facts and anomalous observations during information gathering; and (3) the use of appropriate analogies and metaphors in combining and reorganizing concepts to generate new understandings. Along similar lines, other studies by Runco and Basadur (1993) and Basadur and Hausdorf (1996) have shown that elaboration of those new understandings to generate viable ideas, subsequent evaluation of ideas, and the construction of idea implementation strategies also influence creative problem solving.

Although there is reason to suspect that these kinds of progressive skills influence creative problem solving, it should be recognized that leaders may apply these skills in some unique ways. For example, organizational goals may play a more important role in shaping leaders' problem constructions than is typical on more free-flowing creative problem-solving tasks. Along similar lines, leaders are more likely to rely on a progressive on-line reorganization of extant schemas to generate new solutions (Mumford & Connelly, 1991; Weber, 1992). Finally, the generation and evaluation of alternative solutions may be more markedly influenced by prior experience and perceived interpersonal reactions than is the case in other types of creative problem-solving efforts.

Social Judgment Skills

As noted above, leaders' problem solutions must be implemented and applied in a distinctly social context. As a result, selected alternatives need to be extended

and revised to ensure workability within the context of the organizational environment. This point is nicely articulated by Geiwitz (1993) who argues that understanding and monitoring social dynamics within the problem domain represents a key leadership skill. Further, as Kuhnert and Russell (1990) point out, integration of potential solutions with the practical demands of the organization requires perspective-taking of the capacity to move beyond the problem to see other ways in which solutions can be useful.

These kinds of appraisal and perspective-taking activities are most commonly discussed under the rubric of *wisdom.* Studies by Arlin (1990), Orwoll and Perlmutter (1990), and Sternberg (1985, 1990) have identified a number of capacities that appear to be related to wisdom, including self-objectivity, self-reflection, systems perception, awareness of solution fit, judgment under uncertain conditions, and systems commitment. Moreover, at least one study suggests that measures of these capacities have been formulated that evidence some construct validity (Connelly, Marks, & Mumford, 1993). Although stronger evidence bearing on the nature and significance of these constructs is desirable, there are theoretical reasons why they could have a significant impact on leader performance. For example, objectivity would seem to be necessary whenever one is dealing with a complex system where feedback is ambiguous. Along similar lines, sensitivity to issues of solution appropriateness, as well as an awareness of different constituencies, are likely to be important when integrating solutions into an organization composed of rather loosely linked subsystems, each having somewhat different concerns, responsibilities, and functions.

The various components of wisdom, however, do not represent the only skills needed when bringing potential solutions into the organization. In complex organizational systems, causal linkages are often obscure and difficult to diagnose (Bass & Avolio, 1994). Further, the efforts of making a change are not necessarily linear and any change may be associated with a number of unanticipated, perhaps problematic, consequences. Those observations suggest that skills such as identification of restrictions, analysis of downstream consequences, coordination of multiple activities, and sensitivity to relevant goals may all play a role in leader performance.

Leaders must not only be able to formulate a plan that works within the context of the organization, they must also be able to implement this plan within a distinctly social context, marshaling support, communicating a vision, guiding subordinates, and motivating others. Thus, leaders must also be able to understand and work with others—another point which underscores the need for social skills (Bass, 1990; Boyatzis, 1982; House & Baetz, 1979; Yukl & Van Fleet, 1992; Zaccaro, 1996; Zaccaro, Gilbert, Thor, & Mumford, 1991).

One key social skill that appears to underlie leader performance is social perceptiveness. Zaccaro, Gilbert, Thor, and Mumford (1991) see social perceptiveness as a complex skill involving insight into the needs, goals, demands, and problems of different organizational constituencies. In organizational settings, social perceptiveness allows leaders to identify emerging problems, the potential influence of others on problem solutions, and requirement for organizational groups. It is not enough, however, for leaders to be aware of others. They must also adjust their behavior to cope with the requirements imposed by their perceptions of others. In fact, Zaccaro, Foti, and Kenny (1991), using an experimental rotational design

where individuals were rotated through multiple group situations, found that people who emerged as leaders displayed substantial behavioral flexibility, being capable of changing behavior in accordance with the demands of the situation.

Although social perceptiveness and behavioral flexibility represent key social skills, laying a foundation for effective leadership by providing leaders with the capability to understand the social setting and respond to the dynamics of this setting, leaders must also possess a host of other social performance skills. These include: communication and persuasion; negotiation; conflict management; and coaching. For example, Kabanoff (1985) and Sheppard (1984) have described how the use of various conflict-resolution strategies can contribute to group maintenance and leader performance. Other work by Conger and Kanungo (1988) and House and Shamir (1993) indicates that persuasive skills may represent an essential step in getting subordinates to adopt a vision or a proposed solution plan.

Knowledge

Our discussion of the skills involved in leader performance rests on an assumption evident in our discussion of social skills. More specifically, effective application of all these skills depends on knowledge. In generating solutions, tailoring solutions to the organizations, and implementing these solutions within the organization, leaders need knowledge. In keeping with this proposition, Simonton (1984, 1988, 1990) found that charismatic leaders characteristically have a rather unique set of career experiences providing the knowledge needed to solve the problems confronting various constituencies. As important as knowledge is to skilled performance (Ericsson & Charness, 1994), students of leadership often downplay the role of knowledge in shaping leader performance.

One reason the need for knowledge is often discounted, is that it is frequently confused with information. Knowledge, however, is not simply an accumulation of bits of information. Instead, knowledge reflects a schematic organization of key facts and principles pertaining to the characteristics of objects lying in a domain (Fleishman & Mumford, 1989). Studies contrasting novices and experts within a domain indicate that experts typically have more concepts or schema available, that are organized on the basis of underlying factors that permit them to more accurately diagnose and assess the implications of different pieces of information (Anderson, 1993; Chi, Glaser, & Rees, 1982; Halff, Hogan, & Hutchins, 1986; Salthouse, 1987). The availability of these complex, principle-based schematic structures also appears to characterize leaders, with more successful ones evidencing more complex schematic structures (Streufert & Nogami, 1992) and using structures that apply across a longer time frame (Jacobs & Jaques, 1987, 1990, 1991; Jaques, 1977).

Another reason the importance of knowledge is often overlooked is that several different forms of knowledge appear to play a role in leader performance. To solve leadership problems, knowledge is needed bearing on: (1) the tasks at hand; (2) the organization; and (3) the people with whom one works (Zaccaro, Marks, O'Connor-Boes, & Costanza, 1995). Each of these types of knowledge may exert unique effects on leader performance. Moreover, each type of knowledge may be organized or

structured in different ways, sometimes reflecting a set of base concepts, and other times reflecting more complex mental models, articulating relationships among different concepts (Goldschmidt, 1991). For example, knowledge of organizations may be represented in terms of a complex mental model, in which knowledge of others may be represented in terms of prototype categories.

In addition to these kinds of formal, conscious knowledge structures, experiential knowledge, derived from representations of past experience, may be structured in terms of associational networks (Seger, 1994). These experience-based representational networks influence how leaders define problems, evaluate restrictions, and implement plans. In fact, a series of studies by Sternberg and his colleagues (Sternberg & Wagner, 1993; Wagner & Sternberg, 1985) indicates that this tacit, experientially based knowledge may represent an important influence on leader performance, correlating with pay as well as performance in complex simulation exercises.

SKILLS DEVELOPMENT AND APPLICATION

Our observations with regard to knowledge bring to the fore an important issue that has received only limited attention in our discussion thus far. Knowledge and skills are developed capabilities that emerge over time as a function of education and experience (Ackerman, 1992; Fleishman, 1992). This point is of some importance in contrasting the model presented above with "great man" views of leadership (Bass, 1990; Jennings, 1960; Woods, 1913). Leadership skills and subsequent performance are not viewed as the province of a few gifted individuals. Instead, leadership is held to be a potential in many individuals—a potential that emerges through experience and the capability to learn and benefit from experience.

Differential and Contextual Influences

A skills-based model of leadership, however, is not necessarily incompatible with traditional trait-based models. More basic attributes of the individual—abilities, motivation, and personality—influence the kinds of experiences one has and the kinds of skills that develop as a function of experience. For example, Snow and Lohman (1984) have shown that the rate with which people acquire abstract, principle-based knowledge structures is influenced by intelligence. Intelligence also appears to influence the acquisition of complex problem-solving skills (Baughman, 1997).

Intelligence, or general cognitive ability, is perhaps the individual characteristic that has most often and consistently been associated with leadership. Stogdill (1948) reported 23 studies that found leaders to be brighter than followers; only five studies showed no difference. In a second review, covering research between 1948 and 1970, 25 studies indicated a positive correlation between intelligence and leadership (Bass, 1990; Stogdill, 1974). In subsequent meta-analyses, with the effects of range restriction, attenuation, and sampling error taken into account, the correlation between intelligence and leadership was sizable, with population validities lying in the .50s (Cornwell, 1983; Lord, DeVader, & Alliger, 1986). In keeping with these findings, intelligence has been found to be a characteristic of leader prototypes

(Kirkpatrick & Locke, 1991; Yukl & Van Fleet, 1992) while being related to indices of advancement and success in managerial positions (Howard & Bray, 1988).

Intelligence, however, is not the only ability that might influence the acquisition of requisite skills and subsequent leader performance. Leaders also need crystallized cognitive abilities including written and oral expression, and written and oral comprehension to acquire, exchange, and manipulate information in most, if not all, problem domains (Bass, 1990; Fleishman & Friedman, 1990). Moreover, some fluid abilities, such as fluency and speed of closure, may also be relevant to leader performance, given the need for leaders to solve novel, ill-defined problems. Divergent thinking ability may also be a necessary precursor to effectively defining and solving these types of problems.

Intelligence and other abilities are not the only differential characteristics that might influence the acquisition of requisite leadership skills. Skills development also requires a willingness to enter situations where these skills can be exercised, as well as a willingness to exercise these skills in solving significant organizational problems. As a result, one might expect that certain motivational and personality characteristics also influence both leader performance and the development of requisite capabilities.

With regard to motivation, three characteristics seem essential to effective leadership. First, leaders must be willing to tackle difficult, challenging organizational problems using these problems as a vehicle for growth (Howard & Bray, 1988). Accordingly, achievement and mastery motives, or the motivation to extend one's performance capabilities (Dweck, 1986) can be expected to be related to both skills acquisition and subsequent performance. Second, leaders must be willing to exercise influence. Dominance, as a result, can be expected to influence performance, attracting individuals to situations where those skills can be exercised, motivating effort in those situations. In fact, House, Woycke, and Foder (1988) and Lord, DeVader, and Alliger (1986) have shown that measures of dominance or power motives are consistently related to leadership. Dominance and power motives, however, may not necessarily be desirable unless coupled with a third motive—social commitment (House & Howell, 1992). This point is illustrated in a recent study by O'Connor, Mumford, Clifton, Gessner, and Connelly (1995) who found that a lack of social commitment, as evidenced in negative life themes, resulted in leaders who had disastrous effects on society's long-term best interests.

With regard to personality, it seems reasonable to hypothesize that characteristics that allow leaders to survive and prosper in complex organizational environments may be related to leader performance. A host of personality characteristics have been found to be related to performance on complex social problems (Barron & Harrington, 1981; MacKinnon, 1962). Some of these characteristics, for example, openness, tolerance for ambiguity, and curiosity, may influence leader willingness to tackle novel problems and success in working through these problems. Other characteristics, such as confidence, risk taking, adaptability, and independence, may influence performance by allowing leaders to apply resources more effectively in a turbulent and rather stressful environment (Fiedler & Garcia, 1987). In an extensive review of Myers-Briggs research in managerial samples, Gardner and Martinko (1996) found evidence to suggest that intuitive managers are inclined to be more

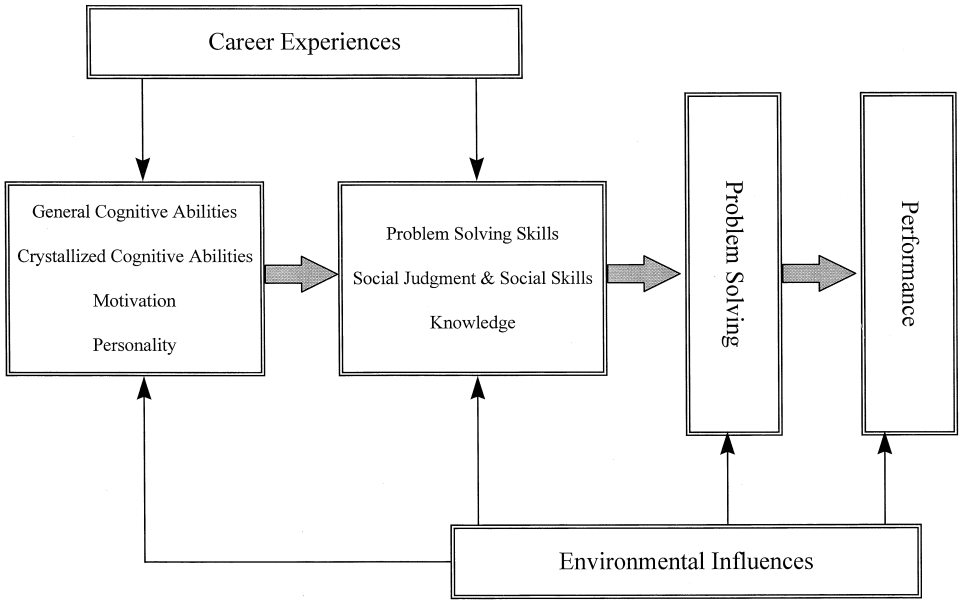

Figure 2. Influence of Leader Characteristics on Leader Performance

idealistic, unconventional, and creative; upper level managers are likely to be more intuiting than sensing; and managers high on perceiving prefer unstructured and dynamic situations and are more flexible and creative.

A Model of Leader Problem-Solving Characteristics

An important notion implicit throughout much of the foregoing discussion is that many differential characteristics exert their effects on leadership by promoting development of requisite knowledge and skills. For example, achievement motivation may promote skills development, just as it serves to motivate performance in the setting at hand. Those observations, in turn, suggest that the differential characteristics related to leader performance are best understood in terms of the mediational model presented in Fig. 2. This model holds that knowledge and skills represent the most direct determinants of performance. Knowledge and skills are in turn influenced by more basic differential characteristics.

The model presented in Fig. 2 makes two other noteworthy points. First, knowledge, skills, problem solving, and performance are all held to be influenced by various environmental facts. Put simply, even the most skilled leader may fail if subordinates are completely incapable of implementing a proposed solution. The leadership literature has long recognized the importance of the social environment in shaping leader performance (Fiedler & Garcia, 1987). The model presented in Fig. 2, however, reminds us that the environment can also have somewhat more subtle effects on leader performance. For example, if information systems or the

pattern of social interactions provide inadequate information to the leader about the problem situation, performance suffers.

Second, this model suggests that career experiences can also exert effects on leader performance. Knowledge and skills develop as a function of experience (Ackerman, 1992; Hulin, Henry, & Noon, 1989). Thus, the experience leaders acquire in the course of their careers should influence whether requisite knowledge and skills are available for problem solving. Given the importance to leader performance of solving novel social problems, one would expect that certain types of experiences would prove particularly beneficial, including: (1) job assignments that provide exposure to novel, challenging problems; (2) mentoring; (3) appropriate training; and (4) hands-on experience in solving related problems. McCauley, Ruderman, Ohlott, and Morrow's (1994) study of job influences on leader development provides some support for this proposition.

Although career experiences shape the development of requisite capabilities, they may exert other types of effects on the various characteristics held to influence organizational leadership. Certain experiences may enable slow growth of intellectual abilities in adulthood (Schooler, 1984). Reputation and past performance affect the perceptions of a leader's performance (Kasof, 1995) which in turn affects the conditions of performance in social settings and the way performance is evaluated. Thus, career experiences may, like the organizational environment, exert a number of complex and subtle effects on organizational leadership.

Skills Development

These observations about career experiences and organizational influences point to a broader conclusion, specifically, skills of the sort described above develop rather slowly, emerging over a period of time as a function of certain abilities and experiences. This point is consistent with the observations of Ericsson and Charness (1994) who note that it typically takes people seven to ten years to acquire the skills needed at the top levels in a career field. In the case of organizational leaders, however, where multiple skill sets and a variety of different forms of expertise are required, this developmental period may be significantly longer.

The time needed to acquire requisite leadership skills has a number of noteworthy implications. Without appropriate developmental experience, even the most intelligent and motivated individual is unlikely to be an effective leader in organizational settings. Along similar lines, people who lack the abilities needed to develop these skills in a timely fashion are unlikely ever to become effective leaders. Thus, leaders are not born, nor are they made; instead, their inherent potentials are shaped by experiences enabling them to develop the capabilities needed to solve significant social problems (Erickson, 1959; Jacobs & Jaques, 1987, 1990, 1991; Lewis & Jacobs, 1992).

The rather slow development of requisite knowledge and skills, however, has another, somewhat more subtle implication. At any given time, the number of people available within an organization who have the requisite knowledge and skills is not typically sufficient to get the job done. Organizations, however, solve the problem by capitalizing on the range of requisite leadership roles available, differ-

entiating among roles with respect to function, level of responsibility, and the type and amount of skill required. Essentially, the complex nature of organizational leadership structures complements the diversity of people and their development.

In fact, Jaques (1977) and Jacobs and Jaques (1987, 1990, 1991) have proposed theories of organizational leadership that expressly take this differentiation into account. They argue that as leaders ascend a hierarchy, the kinds of problems they are confronted with become progressively more complex and long term. These changes in role demands, in turn, require higher levels of conceptual capacity and greater abstract thought. Mumford and Connelly (1991) extended this argument, suggesting that the types of problems confronting senior executives, as opposed to first-line supervisors, also tend to be more ill-defined, more novel, and involve a larger number of interactions among a wider range of constituencies. These authors suggest that higher levels of creative problem-solving skills and complex social judgment skills are increasingly required as leaders move through their careers.

This progressive change in the complexity and demands associated with organizational leadership roles has a number of implications for leader development. First, one would expect leadership roles to be structured to impose progressively greater skill requirements. Second, as leaders move through these roles and acquire experience, one would expect to see gains in requisite problems-solving systems and social skills, as well as the development of more complex principle-based knowledge structures. Third, the knowledge and skills showing gains at one point in leaders' careers may not be identical to the knowledge and skills growing at other points in their careers. For example, it may be difficult for problem-solving skills to grow until the individual has acquired a basic working knowledge of the organization. Along similar lines, the growth of certain systems skills may well depend on the prior acquisition of requisite problem-solving skills. Fourth, because skill development proceeds in a complex fashion, the kinds of experiences that contribute to growth at one point in a leader's career are likely to be different in some respects than experiences contributing to growth in later phases.

The framework sketched out above implies progressive growth of the knowledge and skills needed to solve leadership problems. Certainly, the bulk of the available evidence supports this proposition, suggesting that people move from more concrete operations to progressively more complex, principle-based structures as they acquire expertise (Anderson, 1993; Chi, Bassock, Lewis, Reiman, & Glaser, 1989). These aggregate trends, however, may not reflect what appears at the individual level where more complex patterns of growth and change often emerge (Gardner, 1995; Lerner & Tubman, 1989). Certain individuals, for example, may acquire some types of skills far more rapidly than others, due to their abilities and certain dispositional characteristics. In other cases, individuals may pursue certain experiences or be exposed to certain events that affect the skills they are likely to develop, and the rate at which they develop these skills. These kinds of effects suggest that patterns of skills development for individual leaders may be quite complex giving rise to different patterns of skills and skills development.

To complicate matters further, the nature of organizations and organizational leadership roles may facilitate the emergence of these differential skill patterns. Although leadership roles all involve solving novel social problems, the types of

problems leaders confront over the course of their careers may differ as a result of the functional areas they work in. Organizations need leaders who can manage resources, market products, direct day-to-day work, and drive the organization into the future. These differences in the focus of leadership roles may not only give rise to distinct skill patterns, but may also create the need for leadership teams where a variety of different types of capabilities can be brought to bear in solving significant organizational problems.

CONCLUSION

This article outlines the framework for a new model of organizational leadership—one based on the notion that organizational leadership is a form of skilled performance. This skills-based model of organizational leadership is a distinctly cognitive model based on the proposition that leadership ultimately depends on one's capability to formulate and implement solutions to complex (i.e., novel, ill-defined) social problems. Solving these problems depends, in turn, on a complex set of skills and the availability of requisite knowledge. Broadly speaking, it is argued that the skills needed to solve organizational leadership problems include complex creative *problem-solving skills* associated with identifying problems, understanding the problem, and generating potential solutions; *social judgment skills* associated with the refinement of potential solutions and the creation of implementation frameworks within a complex organizational setting; and *social skills* associated with motivating and directing others during solution implementation. Application of each of these skill sets is associated with various forms of knowledge. Knowledge and skills grow as a function of experience as leaders progress through their careers.

This skills-based model of leader performance paints a rather different picture of leadership than would emerge after a careful reading of the traditional texts (e.g., Bass, 1990; Yukl, 1994). Studies of leadership have focused on the behaviors observed as leaders interact with followers (e.g., Dansereau & Yammarino, 1998; Fleishman, 1973) and on followers' perceptions of leader behavior (e.g., Hall & Lord, 1995; Kim & Yukl, 1995). There is no disputing that leadership is an interactional social phenomenon involving the exercise of influence and others' reactions to these influence attempts. However, it is argued here that *effective* leaders must exercise influence judiciously, tackling the right problems in the right way within the context of other organizational activities. Thus, problem-focused and organizationally-focused cognition represent necessary precursors to the effective exercise of influence.

This skills-based approach to organizational leadership not only reminds us of the importance of certain skills, it reminds us of another important, often overlooked component of leader performance. Leadership is often studied in a vacuum—as a thing that exists outside the context of "real world" organizational problems. However useful this strategy may be in initial theory-testing efforts, crucial components of performance such as knowledge of the organization, are often not included (Komaki, Deselles, & Bowman, 1989). The model presented here assumes that skills application requires multiple forms of knowledge—knowledge of the job,

knowledge of the organization, knowledge of the business, and knowledge of people, particularly those who implement solutions. Without this knowledge, even the most skilled problem solver is likely to be an ineffectual leader. Unfortunately, with a few notable exceptions (e.g., Sternberg & Wagner, 1993), knowledge has received relatively little attention in the leadership literature.

This model of leadership also has some noteworthy implications for how the sources of leader performance are construed. Some theorists see leadership as the prerogative of a few gifted individuals; others see leadership as a function of the situation; still others see leadership as being shaped by the need for certain traits within a given environment (e.g., Fiedler & Garcia, 1987; Podsakoff & McKenzie, 1995). Here, however, the dynamic interaction of the environment and the person, as it gives rise to the development, acquisition, and application of requisite organizational problem-solving skills is seen as the key to understanding leader performance. Thus, skills for circumventing organizational constraints are required, as well as the capability to conceive of organizational problems in practical terms and solving problems that can be solved, often over substantial periods of time within the context of multiple, ongoing managerial demands (Mintzberg, 1975).

These observations, with regard to the implications of skills-based models of leader performance beg a question: Is there any evidence to suggest that the skills and knowledge implied by this social problem-solving model are indeed related to leader performance? Certainly, studies by Guastello (1995), Jaques (1977), Mumford, O'Connor, Clifton, Connelly, and Zaccaro (1993) and Sternberg and Wagner (1993), among others, have provided some indirect evidence for certain key propositions flowing from this model. No studies conducted to date, however, have attempted to provide systematic evidence for the knowledge and skills held to underlie leader performance in this theoretical system.

The following set of articles describes the results obtained in a large-scale study that represents an initial attempt to provide evidence for the meaningfulness of this skills-based model of effective organizational leadership. More specifically, they address the following four key issues. First, they examine the possibility of developing reliable and valid measures of requisite knowledge and skills appropriate to the organization at hand. Second, they examine whether these measures are capable of predicting leader performance, accounting for variance in leader performance beyond that attributed to measures of abilities, motives, and personality characteristics. Third, in keeping with the notion that skills develop, and that higher levels of these skills are required as leaders move into positions of greater responsibility, propositions about leaders' knowledge and skills development over time and experiences linked to this development are identified and tested. Fourth, abilities, motives, and personality characteristics associated with different patterns of leader growth and change are examined.

These last two goals are distinctly developmental in nature. Thus, a developmental approach, based on either a longitudinal or cross-sectional design seemed indicated. Although a longitudinal study was envisioned, the costs associated with any developmental study dictated use of the less costly cross-sectional approach. In the present study, a cross-sectional design was implemented, using leaders in the U.S. Army who were at different points in their careers. This organization

provided a particularly attractive test site, in part because cohorts of leaders progress systematically through their careers, with limited turnover, making it possible to implement a cross-sectional design where many types of cross-organizational confounds were controlled.

The first four articles in this series examine the results obtained in the sample of Army officers as they bear on the hypotheses described above. The first two studies focus on initial development of the measures, their incremental validity vis-à-vis measures of abilities, motives, and personality characteristics, and their relationships to leader performance. The third article examines development of leader knowledge and skills and experiences that appear to be linked to skill growth during different career periods. The fourth article in this series examines how patterns of change in knowledge and skills may be linked to different patterns of abilities, motives, and personality characteristics. The fifth article uses automated measurement techniques to measure related types of leader skills or metacognitive skills. To conclude, the last article in this series takes stock of the results. Here, the overall pattern of evidence is considered as it pertains to the validity of this skills-based model of leader performance in organizational settings. These studies also speak to the development and application of leadership skills as they pertain to such practical problems as selection and development. Finally, inherent limitations in the present study are considered along with promising directions for future research, recognizing that this skills-based approach is in its initial stages of development and require substantial elaboration if, in the long run, it is to make a real contribution to our understanding leader performance in organizational settings.

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