Information Processing and Leadership: A Review and Implications for Application

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In the current paper, contemporary research that has examined the role of information processing in the context of leadership is reviewed and the implications of this research for application are discussed. Although the vast majority of the leadership literature has focused on external and observable outcomes, such as a leader's behaviors, the current paper takes an alternative perspective, reviewing literature that has examined leadership from an information processing vantage point. In contemplating the utility of this perspective, consider for a moment the following questions: How does a subordinate decide whether his/her supervisor is a leader? Why does an organizational supervisor punish one subordinate for poor performance but not another? Why does a supervisor utilize a particular behavioral style? As the literature reviewed throughout this paper shall indicate, the answer to each of these questions lies in developing a better understanding of how leaders and subordinates process information.

To provide an organizational framework, the present paper is divided into three main sections. In the first portion of this paper, a working definition of leadership and information processing are provided. Next, relevant literature dealing with a leader's information processing is reviewed, and finally, relevant literature dealing with follower information processing is discussed.

Defining Leadership and Information Processing

As a starting point, leadership is conceptualized as a social process, one involving both a leader and a follower (Graen & Scandura, 1987; Hollander & Offerman, 1990; Lord & Maher, 1991). Leadership is the investigation of how one individual, labeled a leader, influences a second individual, or group of individuals, labeled followers (Yukl & Van Fleet, 1992). Fundamentally, the social scientific examination of leadership focuses on understanding how the

behavior or actions of one individual changes the behavior or actions of a second individual. As Dwight D. Eisenhower has been credited with saying: “Leadership is the art of getting someone else to do something you want done because he wants to do it”. Although this statement captures behavior, which is the essence of leadership, it neglects the underlying processes that cause behavior. Behavior, whether it is a leader’s or a subordinate’s, does not simply occur, instead behavior is proximally determined by intermediary cognitive processes. Information processing approaches focus on these processes, attempting to discern how individuals acquire, store, retrieve, and use information in order to better understand how they function and adapt to the current context (Lord & Maher, 1991). Thus, while information processing theories still define leadership as influence, they do so by examining the cognitive mechanisms that mediate the influence process, rather than focusing on overt behavioral displays (e.g., transformational behavior).

Understanding the content, creation, and deployment of knowledge is central to the information processing viewpoint. Thus, it is important that certain basic ideas regarding knowledge are set forth, ideas that will recur throughout this review. First, the basic building blocks of knowledge are the symbols or categories that are stored in long term memory. These symbols form interconnected sets, known as schemas (see Fiske, 1995, 1991). Although many different forms of schemas have been discussed in the cognitive and social cognitive literatures (e.g., scripts, person schema, relational schema, self-schema, prototypes), functionally they are quite similar. Schemas assist us in interpreting and making sense of our surroundings (Weick, 1995) and generating adaptive responses (Johnson-Laird, 1989; Newell, Rosenbloom, & Laird, 1989). As an example, imagine trying to understand or behave appropriately during a lecture if you do not already possess a well-developed schema for professor, student, lecture, and test. In

all likelihood, without these schemas, a lecture would make little sense, leaving you utterly confused. Similarly, leaders and followers have schemas that guide their perceptions and actions. Leaders for instance might symbolically represent subordinates as a "good worker" or as a "poor worker", while subordinates might categorize their supervisors as a "prototypical leader" or "non prototypical leader"(Lord & Maher, 1991). One key issue addressed by many of the studies and theories discussed throughout this chapter deals with how the content and structure of leaders' and subordinates' knowledge structures impact leadership processes.

Despite the importance of schema content, equally relevant is schema activation. An important determinant of whether or not knowledge is used is its relative accessibility (Stapel & Koomen, 2001). Given the large number of schemas that exist in long term memory and the limitations of working memory, only a small subset of all available schemas can be activated at any given moment. Regardless of the cognitive architecture that is presumed to underlie human cognition, knowledge must be retrieved, activated, or recreated to influence actions and perceptions. In this regard, many symbolic models of human cognition have suggested that our memories, knowledge, and schema are content addressable (e.g., Anderson, 1987), being activated by relevant external (e.g., subordinates) and internal (e.g., current goals) stimuli and cues. As a result, a second recurring theme throughout this chapter is how particular knowledge structures become activated and the factors that influence activation.

Information Processing from the Leader's Perspective

Relative to subordinate focused research, historically scant attention has been devoted to understanding a leader's information processing. We begin by discussing research and theories that are relevant for understanding the nature and structure of a leader's schema. Next, we consider relevant environmental factors that can activate different schemas.

Knowledge Structure and Content

More so than any other approach, the investigation of behavioral styles has dominated the leadership field. Behavioral approaches are among the most salient exemplars within the discipline's history (e.g., Ohio State Leadership Studies) and can be largely credited with the current revitalization that is underway in the field (e.g., Bass, 1985). Although numerous behavioral taxonomies of effective leader behavior have been suggested (Yukl, 2002), these approaches have focused exclusively on overt behavioral displays, rather than the underlying knowledge structures that produce these behaviors. Recently, however, some scholars have begun to examine whether we might learn something about a leader's behavioral style by analyzing the memory structures he/she holds in long term memory (Mumford, Zaccaro, Harding, Jacobs, Fleishman, 2000; Wofford & Goodwin, 1994).

Exemplary of this approach is the work conducted by J. C. Wofford and his colleagues (Goodwin, Wofford, & Boyd, 2000; Wofford & Goodwin, 1994; Wofford, Goodwin, & Whittington, 1998). Theoretically, Wofford and Goodwin speculate that the underlying reason that transformational and transactional leaders display different behavioral patterns lies in the schemas that the two types of leaders possess for behavior (i.e., scripts), subordinates (i.e., person-schema), and themselves (i.e., self-schema). For instance, Wofford and Goodwin, suggest that while transformational leaders' schemas contain expectations that subordinates are self-reliant and innovative, transactional leaders' schemas contain expectations that subordinates are motivated by rewards and require role clarity. As a result of these differing schemas, individuals comprehend, perceive, and ultimately behave in a distinctively transformational or transactional manner.

To investigate this issue, Wofford and his colleagues (Wofford, Goodwin, &

Whittington, 1998) recruited 96 managers and 157 of their immediate subordinates. To evaluate managerial schemas and scripts, a series of open-ended questions was administered to the managers in their sample (e.g., "My way of getting the most from people is to.."), which were later content analyzed for transformational and transactional statements. Actual transformational and transactional leadership behavior was assessed independently through subordinates' Multifactor Leadership Questionnaire-5x (MLQ) (Bass & Avolio, 1989) ratings. Results indicated that the greater the degree to which mangers' schemas had been coded as transformational, the more highly they were rated as having displayed transformational leadership behaviors by their subordinates. Conversely, the greater the degree to which managers' schemas had been coded as transactional, the more highly they were rated as having displayed transactional leadership behaviors by subordinates. Thus, consistent with their earlier predictions, these data suggest that the schemas stored in memory may be a pivotal precursor to a leader's behavior. Although Wofford's work has focused exclusively on transformational and transactional schemas, we see little reason to doubt that subsequent work can extend his findings to other behavioral styles, although this remains an empirical question.

An immediate implication of Wofford's model is that the likelihood that a leader will utilize a particular behavioral style is contingent upon first establishing appropriate schema in memory. Sensibly, individuals cannot act in a transformational manner unless they possess the appropriate schema and scripts, nor can they regulate their behavior around a transformational identity unless they fully understand what it means to be transformational (see Gardner & Avolio, 1998). Despite limited direct evidence for this position, indirect verification can be surmised by carefully considering leadership training protocols (e.g., Barling, Weber, & Kelloway, 1996). The hub of many training interventions appears to be schema creation (e.g.,

scripts). For instance, a key component of the transformational leadership training program discussed by Barling et al. involved extensive discussions of what transformational leadership behavior is and how to enact this behavior (e.g., scripts). Similarly, the Pygmalion leadership training program described by Eden (Eden et al., 2000), focuses partially on changing supervisory beliefs about subordinates (i.e., person schemas) and establishing new behaviors (i.e., scripts). In addition, scholars in the leadership development (i.e., London, 2002) and coaching literatures (Smither & Reilly, 2001) have noted that direct interventions designed to improve leadership, work in part because they create new schemas (e.g., self-schemas). Thus, while direct assessments of schema creation do not exist, the application of this perspective seems reasonable and practically important.

Logically, if schemas and knowledge are the proximal determinants of a leader's behavior (Wofford & Goodwin, 1994), we might anticipate that variation in leader effectiveness should be a function of the schema held in memory. Leaders with better and more broadly developed schemas and knowledge should perform more effectively than those leaders with poorly developed leader knowledge bases (Hoojiberg & Schneider, 2001). Indeed, research has demonstrated that leadership emergence is contingent upon an individual's ability to flexibly adjust his/her behavior to the current context (Zaccaro, Foti, Kenny, 1991). From an information processing standpoint, one might suggest that expertise (Chi, Glasser, & Farr, 1988) will be associated with a leader's effectiveness. In fact, studies comparing experts and novices across a multitude of domains indicates that the quality of the solutions generated by experts far exceeds those generated by novices (Lord & Maher, 1991; VanLehn, 1989). Why do these discrepancies emerge? In part, because experts have developed richer, more sophisticated schemas. As a result, they can encode and retrieve information more efficiently, require fewer attentional resources,

process information in terms of principles rather than surface features, and can match the current context to solutions held in long term memory.

To test whether effective leadership is dependent on possessing complex and highly organized schema (i.e., expert knowledge), Connelly and her colleagues (Connelly et al., 2000) conducted a large scale study of Army officer performance. Utilizing a sample of 1,807 Army officers, Connelly et al. assessed the extent to which expert leader knowledge was associated with the quality of the solutions generated on structured leadership problems and actual military achievement. According to Connelly et al, expert knowledge should be positively associated with these outcomes because knowledge is the basis of problem representation, information encoding, solution evaluation, and understanding situational constraints. To assess leader expertise, Army officers completed a leadership task sort, a procedure commonly employed in the expertise literature. For this task, each participant sorted 78 leader task statements into self-generated categories. Following this judges assessed the coherence, number, organization, and degree to which the categories were principle based. Relative to novices, experts possess a greater number of categories and these categories should be more coherent, organized and principle based (i.e., rather than surface based). Analyses revealed that expert leader knowledge was positively associated with both military achievement and the quality of the solutions generated for subsequent leadership problems. Moreover, expertise remained a significant predictor of these outcomes, even after general cognitive ability and personality were controlled.

A key issue presented by Connelly et al.'s (2000) findings lies in how leaders develop expert knowledge. As noted by some authors, expertise can take upwards of 10,000 hours to establish (Ericsson & Charness, 1994), suggesting that the development of an expert leader knowledge base will be a slow and progressive process—leaders are not born, rather they are

created. To assess this possibility, Mumford, Marks, Connelly, Zaccaro, and Reiter-Palmon (2000) cross-sectionally contrasted junior, mid-level, and senior level Army officers in terms of their leadership expertise. As was the case in the Connelly et al (2000) investigation, expertise was assessed by having participants sort leadership tasks into categories, which were in turn evaluated on the basis of overall organization, number, coherence, and whether or not they were principle based. Not surprisingly, given prior expertise literature (e.g., Ericsson & Charness, 1994), significant differences emerged between officer knowledge structures and experience. With increasing experience, the knowledge structures of the officers transformed, becoming increasingly more organized, coherent, and principle-based. Furthermore, subsequent analyses suggested that these properties were significantly related to performance differences.

Given the highly restricted samples employed in the previous two studies (i.e., Army officers), one might question whether expertise is important in other settings. In another investigation, Day and Lord (1992) compared the manner in which CEOs (experts) and MBA students (novices) categorized problems. As might be expected based on our prior discussion, while the CEOs tended to categorize problems in terms of the underlying principles represented, the MBA students organized problems in accordance with superficial surface level structures. One advantage afforded by the principle-based understanding exhibited by the CEOs was their ability to arrive at solutions more quickly relative to the students.

Although the previous studies indicate that "expert" knowledge structures are essential precursors to effective leadership performance, this literature has done little to inform us of the underlying cognitive skills that lead to knowledge structure development. One promising approach that could shed light onto this issue has been advanced by Robert Sternberg and his colleagues (Cianciolo, Antonakis, & Sternberg, in press; Sternberg, 2002). According to

Sternberg, skillful leadership is dependent upon an individual's practical intelligence, or his/her ability to learn from experience and apply experiential knowledge (also known as tacit knowledge). From a cognitive standpoint, Sternberg's model suggests that tacit knowledge is dependent upon an individual's ability to selectively encode, combine, and compare available information. Despite its nascent state, initial indications suggest that the integration of practical intelligence into the leadership domain will be promising not only for the selection of leaders, but their development as well.

So far, our review has uncovered the following: (a) knowledge structures are proximal determinants of a leader's behavior (e.g., Goodwin et al., 2000; Wofford et al., 1998); (b) leader schemas are potentially the result of training and experience (e.g. Barling et al., 1996) or practical intelligence (Cianciolo, et al., in press; Sternberg, 2002); and, (c) the extent and organization of this knowledge may determine success in a leadership position (Conelly et al., 2000; Mumford et al., 2000). Before proceeding, it is worth mentioning that some scholars have begun the task of cataloging the role of social knowledge in leadership (e.g., Hooijberg, Hunt, Dodge, 1997). These authors have suggested that as individuals ascend the organizational hierarchy, social intelligence becomes an increasingly relevant determinant of who will and will not be successful (e.g., Zaccaro, 2002). For those readers interested in this burgeoning field, we direct their attention to the recently published book edited by Ronald Riggio and his colleagues (Riggio, Murphy, & Pirozzolo, 2002).

Schema/Knowledge Activation

The content of a leader's knowledge is only one component of the information processing puzzle, albeit an important one. Leadership behavior is not simply the result of possessing knowledge, instead situations must be perceived and these situational perceptions must be related

to knowledge structures. Given this interpretation, the next logical question is, what are the relevant situational cues that influence a leader's knowledge activation? Some hint to this question may be ascertained from contemporary descriptions of leadership functions (House & Aditya, 1997; Mumford et al., 2000), which suggest that leaders must be oriented towards two elements of the world. At the supervisory level, leadership is focused on regulating the "day to day activities of work unit members" (House & Aditya, 1997, p. 444), such as providing guidance and corrective feedback to subordinates. In contrast, at the strategic level, leadership is focused on giving "purpose, meaning, and guidance to organizations"(p. 444). Coinciding with this duality, in the next several sections we discuss how leaders make sense of their subordinates and the external environment. In addition, we also point out how this categorization influences subsequent responses and schema activation.

Categorization of subordinates**.** From a leader's perspective, one of the most important categorizations that can occur are those that are formed regarding subordinates. Over the last quarter century, a significant quantity of empirical data have demonstrated that a leader's categorization of subordinates may have important implications for organizationally relevant outcomes, such as subordinates' performance. In fact, the expectations that are held regarding a subordinate by a leader may become a self-fulfilling prophecy (SFP). Initially proposed by Merton (1948), SFPs refer to a three-stage process that begins with a perceiver's belief or expectation (false at the time that it is held), that an event will occur in the future. The second stage produces or leads to a new behavior that is based on the expectation, and finally in the third stage, the expected event occurs and the prophecy is fulfilled. Thus, simply put, a SFP is the process through which the expectation that an event will occur increases the likelihood of the event's occurrence (Eden, 1992). Over the last 20 years, Dov Eden and his colleagues (e.g., Eden

& Shani, 1982; Davidson & Eden, 2000), have integrated SFP research, initially conducted in educational settings, with leadership processes, introducing the Pygmalion effect.

Eden's Pygmalion experiments are among the most carefully developed field experiments conducted by leadership scholars (Eden, 1992). In nine separate field experiments, Eden and his colleagues have shown that interventions focused on shifting supervisory cognitions of subordinates, which may take as little as five-minutes to experimentally induce, can dramatically impact a subordinate's subsequent performance. To better comprehend the subtlety of the Pygmalion effect, consider for a moment Eden's first investigation with four highly experienced instructors and 105 trainee soldiers in the Israel Defence Forces. In this experiment, Eden and Shani manipulated the beliefs that instructors held of each of their trainees. In this regard, instructors were informed that trainees had completed a battery of tests designed to assess command potential (CP) and that based on testing each trainee had been categorized as possessing high, regular, or unknown CP. In reality, trainee assignment to each of the three CP conditions was completely random. Results indicated that instructors' beliefs about a trainee's CP dramatically influenced trainee performance at the end of basic training, as assessed both by neutral observers who were blind to the experimental treatment and objective tests (e.g., grades from four subjects).

Although Eden's work is consistent with the perspective outlined previously, that a leader's perceptions of subordinates activates different behavioral schemas, his work provides only indirect verification. Wofford and his colleagues (Goodwin, Wofford, & Boyd, 2000; Wofford, Joplin & Comforth, 1996), however, have directly assessed whether leader schema activation shifts with differing perceptions of subordinates. In one such study (Wofford et al., 1996), 76 business students were recruited to participate in an experiment in four person groups.

Upon arrival at the lab, each participant was ushered into a separate room and informed that he/she had been randomly selected to lead the other three participants and that all subsequent communication between the leader and group would be written. Leaders were randomly assigned to one of six group performance and group member ability conditions (3 group performance x 2 group member ability). First, each leader was randomly informed that the group was either performing very poorly, poorly, or quite well. Second, each leader was informed that their group members either had high ability and motivation to complete the task or low ability and motivation to complete the task. Following the feedback, each leader completed a series of behavioral intention items, designed to assess whether he/she planned to utilize a directive style in subsequent interactions with the group. Overall, the results indicated that group performance information and group member ability interacted such that leaders shifted towards more directive leadership scripts when informed that the group was having difficulty with the task, particularly when group members were believed to be low in ability and motivation.

Goodwin et al. (2000) extended the above findings by more directly assessing whether different schemas are activated under alternative subordinate categorization conditions. In their study, Goodwin et al. had 72 human resource students assume the role of the supervisor for a production manager, Frank, and had them read a scenario that described the company and Frank's performance over the last six months. Importantly, one half of the participants were informed that Frank was a poor performer, while the second half of the participants was informed that Frank was a good performer. Subsequent to the familiarization period, all participants completed 13 open-ended questions regarding Frank and themselves, which served as the dependent variable. For instance, participants were asked to describe Frank, their own leadership style, and how they would encourage Frank. Following previous coding schemes

(Wofford et al., 1998), responses to these 13 items were coded for the occurrence of transformational and transactional schemas. Participants assigned to the poor performing employee condition spontaneously reported a greater number of transactional thoughts relative to those in the good performing employee condition. In contrast, the opposite pattern of schema activation emerged for transformational leadership. Thus, the effective and ineffective performing subordinates activated different cognitive schemas.

In summary, given the extant literature (i.e., Eden, 1992; Goodwin et al., 2000; Wofford et al., 1998) it seems reasonable to conclude that leader categorizations of subordinates constrain the behavioral schemas that are most accessible. These findings should come as little surprise to readers who are already familiar with the contingency models reviewed in previous chapters, which suggest that effective leadership depends on the ability to behave flexibly across different situational constraints (see Chemers, 1997). Thus, while the ability to flexibly respond to different targets may be quite advantageous (Hooijberg & Schneider, 2001), what is less clear is how leaders make sense of a subordinate's actions. We turn to this issue next, reviewing perhaps the most well established area of leader information processing inquiry, leader attributions.

Categorization of subordinates: Attributions. During the course of a single day, a manager will interact numerous times with his or her subordinates, providing them with encouragement when they behave exceptionally or correcting them when they behave inappropriately. Logically, by distributing rewards and punishments, leaders attempt to regulate the performance of their subordinates and workgroups. A more complicated question is, what dictates a leader's response? One intriguing, and extensively researched, possibility is that a leader's responses are mediated through the causal attributions that he/she forms of a subordinate's behavior (Green & Mitchell, 1979; Mitchell, Green & Wood, 1981).

Imagine that a subordinate, George, fails at a task that he has been assigned to complete. Should George's supervisor infer that George's failure is due to some limitation within George (e.g., George's effort or ability) or that it was contextually determined (e.g., task difficulty or bad luck)? Drawing upon Kelley's (1967) attributional framework, Green and Mitchell (1979) have suggested that the attribution drawn by George's supervisor will depend on three informational cues. First, is the same behavior exhibited in similar situations at different times (i.e., consistency), second, do others behave similarly (i.e., consensus), and third, does the individual behave similarly in other situations (i.e., distinctiveness). According to this framework, when distinctiveness and consensus are high, but consistency is low, supervisors should make external attributions for a subordinate's behavior. In contrast, when distinctiveness and consensus are low, but consistency is high, supervisors should form internal attributions. Which of these two attributions is formed may have important ramifications for supervisory responses. For instance, it makes little sense to punish or sanction a subordinate for an event that is not of his/her own doing.

In an initial test of this model, Mitchell and Wood (1980) examined the attributions and responses of nursing supervisors following the presentation of a poor performance episode by a nurse. In a fully repeated measure design, 23 nursing supervisors were presented with six vignettes that fully crossed three levels of attributional cues with two outcome severity levels (serious versus not serious). Along the attributional variable each vignette varied in terms of whether it provided information: (a) consistent with an internal attribution; (b) consistent with an external attribution; or (c) no attributional information. Results indicated that the presentation of cues that were indicative of an internal attribution, coupled with a severe outcome, led the nursing supervisors to draw internal attributions to a greater extent than the other conditions.

Furthermore, the attribution that was formed influenced how the nursing supervisors responded to the event. When internal attributions were drawn, the nursing supervisors were more likely to direct their response at the nurse in question (i.e., reprimand, monitor future performance, terminate, counselling). Subsequent studies, using alternative stimulus materials and populations, have reinforced the basic tenets of the framework (e.g., Ashkanasy, 1995; Mitchell & Kalb, 1981), suggesting that attributions are a critical mediating cognitive process between supervisory perceptions of subordinates and supervisory responses.

In addition to confirming the model, ensuing studies have extended the attributional framework, investigating potential moderators and mediators. In one line of research, Dobbins and Russell (1986b) examined supervisory liking, predicting that leaders would attribute poor performance to internal factors and respond more punitively towards a disliked, versus a liked, subordinate. Coinciding with this expectation, a laboratory and a field study largely confirmed these hypotheses. In a second extension, Dobbins and Russell (1986a) found that leaders were more inclined to draw internal attributions for subordinate behavior due, in part, to self-serving biases (i.e., because this deflects blame from the leader). Interestingly, other data indicate that one way to mitigate this bias is to provide supervisors with direct experience in a task domain (e.g., Mitchell & Kalb, 1982). That is, the more experience a supervisor has, the more likely he/she is to consider situational/environmental factors when formulating an attribution and the less likely he/she is to recommend changes to the task (i.e., simpler materials).

One limitation of the data reviewed previously is that it was collected from single interactions with subordinates and did not examine whether a leader's attributions influence his/her subsequent interactions with subordinates. To address this issue, Offerman, Schroyer and Green (1998) randomly assigned participants to leader or subordinate roles on a two-trial

experimental task (building abstract designs). Following the initial trial, leaders were provided with bogus feedback regarding subordinate performance (either good or poor) and whether this performance could be attributed to ability, effort, or luck. Offerman et al. anticipated that the behaviors of the leaders would depend upon the type of attribution that he/she made for the groups' performance. For instance, while poor performance that was attributed to effort (an internal and unstable cause) might motivate leaders to actively intervene, similarly poor performance that was attributed to luck (an external and unstable cause) might not motivate any response. Indeed, results demonstrated that the attributions made regarding group performance significantly affected a leader's subsequent interactions and behavior towards a group. For example, when a group's poor performance on trial 1 was attributed to effort, group leaders became significantly more talkative during trial 2. Interestingly, when a group's good performance on trial 1 was attributed to luck, group leaders also became significantly more talkative on trial 2. In addition to talkativeness, similar findings were found for the evaluative nature of the leader's comments and his/her recommendations to punish the group. Overall, these findings suggest that the attributions formed by leaders are important antecedents to their subsequent behavior.

Monitoring the external environment. Although researchers have traditionally concentrated on understanding how lower level leaders influence subordinates, recently a shift has occurred as scholars have become interested in understanding strategic level executive leadership (Yukl, 2002, p. 341). Interest in strategic level leadership is not surprising given the impact that senior level executives have on organizational performance (e.g., Day & Lord, 1988; Thomas, 1988). One of the essential functions performed by strategic level leaders, relevant to the information processing perspective taken in this chapter, is environmental monitoring and

scanning. Unlike supervisory leaders who monitor, categorize, and react to their subordinates (e.g., Green & Mitchell, 1979), strategic and upper level leaders' attention must be directed beyond the internal milieu of the work group to the external environment within which an organization exists (Kraut, Pedigo, McKenna, & Dunnette, 1989). Because organizations are open systems (Katz & Kahn, 1966) the external environment must be understood so that organizational fit can be ascertained and appropriate responses generated (Lawrence & Lorsch, 1967). Thus, as was the case with supervisory leadership, categorizations of the environment serve to regulate and direct subsequent action.

External environments can be assessed and perceived along several dimensions (e.g., certainty, Milliken, 1987), here, however, we restrict our discussion to perhaps the most widely investigated environmental categorization, threats versus opportunities (Dutton & Jackson, 1987; Jackson & Dutton, 1988). Utilizing categorization theory, Jane Dutton and Susan Jackson have conceptualized threats and opportunities as two perceptual schemas, suggesting that the degree of overlap between current environmental cues and each schema (i.e., prototype match) dictate whether the external environment is labeled a threat or an opportunity. In an initial investigation, Jackson and Dutton (1988; Study 1) outlined the structure of each of these schemas by asking 78 executives to rate the extent to which 56 environmental conditions were characteristic of an opportunity or a threat. Interestingly, their results suggested that distinctive environmental cues characterized threats versus opportunities. Specifically, environmental cues that were negative, uncontrollable, and could lead to a potential loss were considered a threat while environmental characteristics that were positive, controllable, and could lead to a potential gain were considered an opportunity.

Although the initial experiment outlined the content of the threat and opportunity

schemas, it left unanswered the question of whether schema consistent cues would actually lead perceivers to categorize environments as threats or opportunities. To examine this question, Jackson and Dutton (1988, Study 2) recruited 83 MBA graduates and had them evaluate four types of scenarios, which varied in terms of the threat/opportunity information provided. Here, scenarios either contained (a) distinctive threat cues; (b) distinctive opportunity cues; (c) ambiguous cues (cues judged to be both a threat and opportunity); or (d) neutral cues (cues judged to be neither a threat nor an opportunity). Following each scenario, participants evaluated the situation in terms of the degree to which it represented a threat or an opportunity. As expected, the distinctive threat cue scenario and the distinctive opportunity cue scenario were categorized by perceivers as a threat and opportunity, respectively. Interestingly, the ambiguous cue condition was categorized as threatening, leading Jackson and Dutton to conclude that strategic leaders may be biased towards categorizing environmental conditions as threatening.

One unresolved issue is whether threat and opportunity categorizations have any implications for how strategic level leaders respond. Given our earlier discussion of supervisory leaders (e.g., Offerman et al., 1998), it should come as no surprise that environmental categorizations are considered to be proximal causes of subsequent organizational responses (Chattopadhyay, Glick, Huber, 2001; Dutton & Jackson, 1987; Thomas, Clark, & Gioia, 1993). Supporting this notion, Chattopadhyay and his colleagues examined the degree to which perceptions of threats and opportunities were associated with internal or external organizational responses. Following prospect theory (Kahneman & Tversky, 1979), they hypothesized that organizations would be risk-seeking when faced with likely losses (i.e., threat), seeking external solutions affecting the external environment; whereas they would be risk-averse when confronted with likely gains (i.e., opportunity), seeking internal solutions affecting the internal

organizational structure. The results partially supported these hypotheses, demonstrating that the initial categorization of the environment as a threat led to a greater likelihood of responding with a riskier external solution. Although Chattopadhyay et al.'s work is promising, given the dearth of studies that have directly investigated this topic, additional work is needed before firm conclusions can be drawn regarding how strategic leaders' categorizations impact organizational responses.

A final consideration is whether or not aspects of the individual perceiver or situation will predispose strategic leaders to rely upon an opportunity or threat schema. Given the number of potential schemas available, activation is jointly determined by chronic individual differences and situational factors. Within the strategic leadership literature, some theoretic models indicate that the personal characteristics of strategic leaders, such as experience and values, can color environmental perceptions (e.g., Hambrick & Mason, 1984). Coinciding with this perspective, research has shown that a perceiver's self-efficacy is positively associated with the likelihood that a situation will be categorized as an opportunity (Mohammed & Billings, 2002). Similarly, research has also indicated that the timeframe of an event can influence the use of threat and opportunity schemas (Highhouse, Mohammed, Hoffman, 2002). Thus, although the categorization of the environment as a threat or opportunity has important implications, to date insufficient attention has been directed towards understanding the individual difference and contextual variables that moderate usage of these schemas.

Future Directions

Our review has highlighted many of the advances that have been made in terms of understanding leader information processing. However, despite these gains, many challenging questions remain. For instance, to date, only a narrow slice of the environment has been

considered by scholars. Yet, it is abundantly clear that leadership is contextually embedded and that leaders must simultaneously react to, and make sense of, an enormous number of environmental cues (Lord, Brown, & Harvey, 2001; Zaccaro, Mumford, Connelly, Marks, & Gilbert, 2000). How can such an enormous array of features be simultaneously modeled? Although promising frameworks have been suggested (e.g., Lord et al., 2001; Lord, Brown, Harvey, & Hall, 2001) future research is still needed to examine their usefulness. Relatedly, a greater amount of attention must be paid to how executive leaders solve the ill-defined problems that typically characterize much of their work (Mumford et al., 2000). Finally, more attention should be devoted towards better integrating the information processing perspective with other approaches, many of which have been outlined throughout this book. It seems likely that such efforts would illuminate why many of our most popular leadership constructs are important. For example, while strong evidence supports an association between an individual's personality and leadership outcomes (e.g., Judge, Bono, Ilies, & Gerhardt, 2002), personality based work has not clearly highlighted why such associations exist. One possibility is that personality impacts outcomes through schema creation (McCauley, 2001), serving to influence both an individual's openness and motivation to learn (Ericsson & Charness, 1994).

Information Processing from the Subordinate's Perspective

In the first half of this chapter we concentrated on the information processing of leaders, in the remainder of the chapter we shift our focus to the minds of subordinates. Given that leadership is a social process that unfolds between at least two social agents, a leader and a follower, the effectiveness of leadership depends on how leaders affect subordinates. Yet, what is it about a leader that allows him/her to influence a subordinate? A cursory examination of the leadership literature suggests that the answer sought by most scholars has been to investigate the

behaviors or behavioral styles exhibited by leaders (Brown & Lord, 2001). However, just as our previous review suggested that leaders do not directly react to environmental stimuli, neither do subordinates. Instead, the effect of a leader's actions are dependent upon the symbolic structures that subordinates use to represent these actions (Lord & Maher, 1991). Below, we concentrate on these internal symbolic knowledge structures, discussing their origin, structure, and the processes that lead to their application. Practically speaking, knowledge about subordinate sense making and categorization processes is pivotal for understanding effective leadership, as it is these mental processes that mediate the impact of a leader's behaviors on relevant outcomes (Hollander & Julian, 1969; Lord & Maher, 1991).

Content and Structure of Leader Schema

Before continuing, take a moment and contemplate how you might respond if you were asked to distinguish a leader from a non leader. Following some meditation on this topic, it is probable that many readers would reply to our inquiry by articulating a long list of features that characterize leaders. Readers might, for instance, suggest that leaders are intelligent, dedicated, self-sacrificial, goal-oriented, and decisive people, to name but a few possibilities. As this simple exercise highlights, each of us holds within our long term memory, a large and well-elaborated belief system regarding those features that we each believe distinguish leaders (Lord, Foti, Phillips, 1982), often referred to as an implicit leadership theory (Lord, Foti, & De Vader, 1984). In fact, our knowledge of social categories, such as "leader", are an essential means by which we navigate our world, allowing us to direct our limited attention to relevant aspects of the environment and fill in information that is not readily apparent. For instance, research into implicit leadership theories has documented their pivotal role in leadership perceptions, attributions, and subordinate responses to behavioral questionnaires (e.g., Eden & Leviatan,

1975; Lord et al., 1984). In contrast to the limited attention devoted to studying a leader's schemas, considerably greater strides have been made over the last 25 years to better understand perceivers' schemas of leaders.

According to Lord and his colleagues (Lord et al., 1984) the decision to label an individual as a leader is dependent on the extent to which the features of a target overlap with the features that distinguish the leader category (i.e., prototype). Following the probabilistic view of concept organization (Rosch, 1978), Lord has suggested that the leader category held in memory is fuzzy and ill defined. Simply put, although each of the features of the category may be typical for category members, no single feature defines the category. Thus, as a result, the absence of any single feature does not eliminate the possibility that a target belongs to a particular category, instead it simply implies that the target is less prototypical of the category. For instance, although "birds" typically fly, the fact that a particular animal does not fly (e.g., a chicken) does not preclude it from membership in this category, it simply suggests that the target may be less prototypical than other exemplars (e.g., robin).

The prior paragraph suggests that the leader category is composed of a fuzzy set of features, whose presence or absence dictate the degree of fit with the category, but what are these fuzzy features? Following, Cantor and Mischel (1979), Lord has suggested that the leader category is structured around the traits that distinguish leaders. The centrality of traits for social categories, such as leader, should come as no surprise to readers who are familiar with contemporary social-cognitive research. Social-cognitive research has shown that perceivers spontaneously and automatically encode behavior in terms of the underlying trait constructs that are implied by a behavior (e.g., Uleman, Newman, & Moskowitz, 1996). Coinciding with these basic person perception processes, Lord, De Vader, and Alliger (1986) found, in a meta-analytic

investigation, that many personality traits are highly associated with leadership perceptions (e.g., dominance and intelligence). Although this work indicates that the content of perceivers' implicit leadership theories (ILT) may be largely trait-based, it does not precisely clarify the content of these categories.

In perhaps the most comprehensive analysis of the content of ILTs, Lynn Offermann and her colleagues (Offermann, Kennedy, & Wirtz, 1994) conducted a five-stage investigation. During the first phase of their work Offerman et al. had 115 undergraduate students generate lists of up to 25 trait terms that described a leader, resulting in 160 unique traits. In the second phase, they presented 686 undergraduates with these 160 traits and had them rate, on a 10-point scale, the degree to which each of the traits was characteristic of a leader. These item ratings, in turn, were subjected to a principal components factor analysis, resulting in 57 items representing eight distinctive leader category dimensions: sensitivity, dedication, tyranny, charisma, attractiveness, masculinity, intelligence, and strength. As further verification, the dimensionality of perceivers' implicit theories was assessed by having a new group of 44 participants categorize the 57 items identified during the previous phase into the eight factors. During this phase, items that were not correctly sorted by 70% of participants were eliminated, resulting in a final set of 41 items. During the final two phases of the project the dimensional structure of the instrument was compared between males and females and examined in a sample of 260 working adults. These last two stages revealed that the eight-factor structure was robust across these groups, suggesting that there is a culturally shared, multidimensional knowledge structure regarding what it means to be a leader. However, is there simply one leader category held in long-term memory? Are our beliefs about leaders the same, regardless of whether they are political, academic, or religious leaders? To address this issue we turn our attention back to Rosch's seminal work on category

structure (Rosch, 1978) and Lord's extension of this work to leadership (e.g., Lord et al., 1984).

Rather than possessing a single category, Rosch (1978) suggests that mental categories can be hierarchically arrayed into three levels: superordinate, basic, and subordinate. At the highest, most inclusive level, referred to as superordinate, the broadest and most abstract representations of the prototype exist (e.g., animal). Immediately below this level are the basic level representations of the category (e.g., bird) and embedded below this are the subordinate representations of the category (e.g., robin). The most important and useful level of representation are the prototypes located at the basic level, because they provide the greatest level of differentiation among stimuli. Extending Rosch's viewpoint, Lord et al. (1982; 1984) have posited that just as natural objects can be differentiated into three hierarchical levels, so too can our cognitive representations of leaders. At the superordinate level is the most general distinction between a leader and a non leader. At the basic level, perceivers take into account contextual information and differentiate between leaders from different contexts. For instance, Lord et al. (1984) suggest, on the basis of a content analysis of media outlets that 11 different basic level leaders can be differentiated: business, finance, minority, education, religion, sports, national politics, world politics, labor, media, and military. Finally, at the lowest level, leaders are differentiated within each of the contexts, providing a contextually defined leadership prototype (e.g., female military leader versus male military leader).

As the previous literature suggests, perceivers possess large multidimensional, contextually sensitive schema for leadership, but do all perceivers share precisely the same schema? Given that leader prototypes are social constructs, formed on the basis of interactions within a given group, plausibly we might predict the emergence of distinct prototypes between groups. Motivated by increasing globalization and diversity and the possibility that expatriate

managers fail because their definition of leadership does not coincide with subordinates in the host country (Shaw, 1990), some researchers have investigated whether leader prototypes exhibit cross-cultural variability (e.g., Den Hartog, House, Hanges, & Ruiz-Quintanilla, 1999; Gerstner & Day, 1994). To assess the plausibility of this idea, Gerstner and Day (1994) had 142 graduate students from eight countries (n = 10 to n = 22) evaluate the prototypicality of 59 attributes that had been identified in prior work (Lord et al., 1984). Coinciding with their hypotheses, discernable differences emerged in the leader prototypes as a function of culture. While encouraging, one clear limitation with the Gerstner and Day investigation lies in our ability to draw conclusions on the basis of such a limited and restricted sample. In part to circumvent this limitation, others have investigated leader prototypes across a broader spectrum of societies (Den Hartog et al., 1999).

In their investigation, Den Hartog et al. (1999) examined the extent to which leader attributes were universally shared. To test this idea, they had 15,022 middle managers, from 60 different societies (average per society n=250) rate the degree to which 112 leadership items (composing six second order factors) impede or facilitate effective leadership. In terms of the second order factors, three emerged as characteristic of outstanding leadership across all or most of the 60 societies investigated (charismatic, team-oriented, participative), one was universally endorsed as inhibiting leadership (i.e., self-protective), while the last two were culturally contingent (i.e., humane orientation and autonomous). Similarly mixed results were found at the item level. Although many items were universally endorsed (e.g., just, honest), a relatively large number of attributes exhibited substantial cross-cultural variability (e.g., self-sacrificial, enthusiastic, individualistic). Together, the available data (e.g., Gerstner & Day, 1994; Den Hartog et al., 1999) indicate that although universal attributes of leadership exist, there is also

substantial variability in our definitions of leadership, seemingly arising from our personal experiences. Inconsistencies in the prototypes across cultures suggest that leaders may have difficulty transitioning to a culture that does not share a similar conceptualization of leadership.

Beyond cultural influences, are there other experiences that are pivotal in shaping leader category content? One possibility, investigated by Tiffany Keller (1999), is that influential role models from our past shape the content of our leader categories. Following the logic of social learning theory, Keller hypothesized that individual endorsement of prototypical leader elements is conditional on parental characteristics. Using the prototypical elements isolated by Offerman et al. (1994), Keller had participants rate the extent to which each characteristic was descriptive of their mother, their father, and an ideal leader. Several interesting relationships emerged, suggesting that participants' perceptions of their parents colored their image of the ideal leader. For instance, father tyranny (e.g., manipulative and power-hungry) was negatively associated with the degree to which participants endorsed sensitivity as a characteristic of an ideal leader, but was positively associated with participants' beliefs that tyranny was an ideal characteristic of a leader. Similarly, father dedication was positively related with participants' beliefs that dedication was descriptive of an ideal leader. Beyond Keller's examination, little effort has been directed towards understanding leader prototype formation, however, given that leader influence is dependent on leadership perceptions, developing a better understanding of prototype development warrants additional attention.

Our review suggests that the leader category is a large, multidimensional, hierarchically arranged, contextually sensitive structure, whose content is determined in part by a social agent's experiences (e.g., culture, paternal behavior). Yet, what is the developmental trajectory of the leader category? Based on prior developmental theory, Matthews, Lord, and Walker (1990)

argued that with increasing age, leadership perceptions and judgements would shift from being based on specific exemplars and observable characteristics to being based on abstract prototypes. To test this idea they recruited 159 participants from the 1st, 3rd, 6th, 9th, and 12th grades and had them complete a series of open-ended questions regarding what it means to be a leader. Coinciding with their expectations, significant differences emerged in terms of how different aged children conceptualized leadership. Relative to older children (i.e., 6th, 9th, and 12th grades) younger children's (1st and 3rd grades) leadership judgements were based on specific actions, outcomes, and exemplars (e.g., parents), whereas, older children based their judgements on a highly elaborated leader prototype. These data suggest that with repeated exposure and experience, children generate an underlying leader prototype, which comes to serve as the standard against which they form their leadership judgements.

How Do We Label Leaders?

How do we decide that someone is a leader? Information processing research has highlighted two possible pathways (Lord, 1985). First, the label "leader" may be ascribed on the basis of a perceiver's recognition that the actions, traits, and behaviors of a target are consistent with the information contained in his/her leader schema. Second, a leader label can be inferred by perceivers, based on any outcomes that are associated with the individual or the current context. We begin by discussing evidence for the recognition-based pathway, then, we follow up by reviewing evidence for the inference-based processes.

Recognition-based processes

. In their categorization theory of leadership perceptions, Lord and his colleagues suggest that the assignment of the leader label is contingent on the degree to which a given target's features overlap with a perceiver's leadership category (Lord et al., 1984). That is, the greater the overlap that exists between a target's features and the prototype

that is held in a perceiver's long term memory, the more strongly the category label leader will be applied to the target. In one of the original investigations to test this notion, Lord et al. (1984; Study 3) examined the degree to which individuals' leadership ratings and causal ascriptions to a leader target were contingent on a target's fit to the leader prototype. In this investigation, they randomly assigned 95 participants to read one of three vignettes, which varied in terms of whether the target, John Perry, displayed prototypical, neutral, or antiprototypical leadership behaviors. After reading these descriptions, participants were asked to rate John Perry's leadership, the likelihood that he would engage in prototypical, antiprototypical, and neutral behaviors, and his accountability and responsibility for the success of a new product. Overall, the results indicated that the leader manipulation accounted for significant variance in all three relevant outcomes (η^2 = .31 to 59), thereby providing strong support for the categorization perspective. Perhaps most interesting, however, was the fact that once categorized, perceivers formed expectations for the target's future behavior, hinting at the possibility that perceiver categorization may initiate a self-fulfilling prophecy (see Eden, 1992), although this possibility requires empirical examination.

Since the initial investigations, subsequent studies have replicated and extended categorization theory, providing further refinement and understanding of how categorization processes function. For instance, research has documented that leader categorization: (a) mediates the relationship between observable target behaviors and leadership ratings (Fraser & Lord, 1988); (b) is not dependent on the availability of cognitive resources (Maurer & Lord, 1988); (c) explains ratings of real world leaders (Fielding & Hogg, 1997; Foti, Fraser, & Lord, 1982); and, (d) biases information retrieval (Rush & Russell, 1988). Additionally, researchers have also extended the categorization framework by assessing possible boundary conditions. In

perhaps some of the most intriguing and interesting work here, Michael Hogg and his colleagues (cf. Hogg, 2001) have integrated the categorization model with social identity theory.

Based on contemporary social psychological work on social identity theory, Hogg has proposed a social identity theory of leadership (Hogg, 2001). Originally developed to explain relationships between groups, social identity theorists have more recently extended this framework to understand intragroup phenomenon. Unlike Lord's categorization theory, which focuses strictly on how the normative leader prototype will dictate leadership perceptions, the social identity perspective suggests that leadership perceptions will depend upon a target's fit with a group's prototype. As with the leader prototype, the group prototype is fuzzy, representing the prototypical values, attitudes and norms of a group. As a result, while no single individual precisely fits the group prototype, individuals do vary along a group prototypicality gradient. A key tenet of this perspective is that that the stronger the degree to which a perceiver identifies with a group, the greater the extent to which a target's fit to the group prototype will guide leadership perceptions.

To test the core propositions of the theory, Hains, Hogg, and Duck (1997) recruited 184 undergraduate students to participate, ostensibly, in a group exercise. At the outset of the experiment, participants' identification with the group was manipulated (high identification versus low identification) and two pieces of information about a leader were varied. In terms of information about the group leader, both his/her fit with the group prototype (high versus low) and his/her fit with the leader prototype (high versus low) were varied. Following the manipulation of this information, participants completed a series of measures intended to assess their endorsement of the leader. As predicted by the social identity perspective, when group salience was high, relative to when it was low, participants were more likely to endorse the

leader if he was prototypical of the group. Interestingly, fit with the leader prototype remained important predictor of participants' leadership judgments ($\eta^2 = .22$). Thus, overall, these results suggest that in addition to forming leadership perceptions on the basis of the leader prototype, fit to the group prototype may also be important, particularly when an individual's group identification is salient. Finally, it is worth noting that these effects are not isolated, as they have been replicated both in the field (Fielding & Hogg, 1997) and with alternative experimental paradigms (Hogg, Hains, & Mason, 1998).

One potential implication of Hogg's work for leader categorization theory is that the leader category may be a much more highly fluid and adjustable knowledge structure than previously indicated. Is it possible that those individuals who possess high group identification have very different leader prototypes activated than those individuals who are low in identification? If so, what are the relevant factors that influence the leader category and how are different pieces of information integrated? To address these questions, Lord and his colleagues (Hanges, Lord, & Dickson, 2000; Lord, Brown, & Harvey, 2001; Lord et al., 2001) have suggested that rather than being fixed memory structures that are retrieved from long term memory, perceivers' leader categories are dynamically created on the fly. Utilizing connectionist models of human information processing, Lord has argued that perceivers simultaneously integrate a multitude of internal (e.g., identification with group) and external (e.g., societal culture) sources of information, thereby generating a contextually appropriate leader prototype. Consistent with this line of thinking, prior research has shown that the leader prototype that is generated by a perceiver is dependent on such factors as the hierarchical level of the leader in the organization, his/her gender, national culture, and task type (see Lord et al., 2001). Thus, although more research is needed, it seems quite plausible that findings such as Hogg's can be

parsimoniously integrated into newer leader prototype generation models.

One final matter that deserves consideration is whether or not there are any situational triggers that enhance the likelihood that perceivers will utilize the leader category when forming target perceptions. As many readers may already suspect, innumerable categories are available to subordinates (e.g., gender, race, leader) and, as a result, it is necessary not only to understand the structure of the leader prototype, but also comprehend those aspects of the context that increase the accessibility of the leader category. Given that a critical leader function is to provide direction during times of uncertainty, it seems plausible that situational factors that induce uncertainty in perceivers will increase the usage of leader prototypes. In line with these expectations, several studies have shown that crisis contexts enhance perceivers' attributions of leadership to targets (Hunt, Boal, & Dodge, 1999; Meindl, Ehrlich, & Dukerich, 1985; Pillai, 1996) and that crises may unconsciously activate the leader category (Emrich, 1999). Whether there are additional contextual features (e.g., culture), beyond crises, that accentuate leader category accessibility remains an under investigated, but intriguing, area of future inquiry.

Inference-based processes. Imagine an organization that surpasses all projected performance goals earning well beyond what was expected for the quarter or year; a thriving, flourishing company that consistently meets or exceeds all targets. Without giving it much thought, who should be credited for the organization's success? For many readers, credit will be assigned to the leader at the helm of the organization– the CEO or President. Seemingly, our implicit theories suggest that leaders "do or should have the ability to control and influence the fates of the organizations in their charge" (Meindl et al., 1985, p. 96). Effective leaders are expected to produce positive outcomes. When they fail we fire or replace them, when they succeed we credit and reward them. Logically, if our notions of leadership are intertwined with

group outcomes, the valance of these outcomes should color the inferences that we draw regarding a leader. Is this the case? Numerous studies, extending back over the past 20 years, have utilized the performance cue paradigm to investigate this very issue (e.g., Binning, & Lord, 1980; Larson, 1982; Larson, Lingle, & Scerbo, 1984; Lord, Binning, Rush, & Thomas, 1978; Phillips & Lord, 1982).

In a characteristic performance cue experiment, participants are brought into the lab and asked to view a videotaped group, ostensibly because the researcher is investigating perceptions of group interaction. Subsequent to viewing the tape, participants are asked to rate the group's leader on a behavioral scale that contains prototypical and nonprototypical leader behaviors. Prior to providing these behavioral ratings, however, participants randomly receive either positive performance cue information (i.e., the group performed well) or negative performance cue information (i.e., the group performed poorly). Fundamentally, the central issue of interest within this paradigm is whether or not perceivers' behavioral ratings will be colored by the performance cue, as they should if outcome information is part of our implicit leadership theories.

Resoundingly, the extant literature suggests that performance cues have a dramatic impact on our perceptions of leadership (e.g., Binning, & Lord, 1980; Larson, 1982; Larson et al., 1984; Lord et al., 1978; Phillips & Lord, 1982). Moreover, the available data also suggest that the effect is quite robust, as it: (a) is equally potent, regardless of whether it is delivered before or after viewing the leader (Larson, 1982), although the cognitive mechanism may differ (Larson et al., 1984); (b) influences ratings even when one has personally interacted with the group (Binning & Lord, 1980); (c) affects global ratings of leadership (e.g., initiating structure) more than ratings of specific behavior (Gioia & Sims, 1985; Binning, Zaba & Whattam, 1986);

and, (d) functions in an additive fashion with categorization processes (Lord et al., 1978). Despite its generally robust nature, it is noteworthy that these effects may be bound by the observer's processing goals (Murphy & Jones, 1993) and a follower's social distance from a leader (Shamir, 1995). On this latter point, Shamir has suggested that because distant and close followers have different information available, the attributions that are drawn may depend upon the social distance of a subordinate. For instance, while distant followers may use overall organizational performance, close followers may rely on actual leader performance (For recent extensions of these ideas, see Antonakis & Atwater, 2002). Given the dearth of available research, more work is needed to better understand the boundary conditions of performance cue effects.

One question raised by our previous discussion is whether there is anything leaders can do to mitigate the potentially deleterious impact of negative performance cues. One intriguing possibility lies in perceivers' shared understanding of emotions. According to appraisal theories, the emotions displayed by a target act as cues, which communicate the appropriateness of different interpretations (Smith & Ellsworth, 1985). For instance, while unfavorable outcomes, when they co-occur with sadness, are perceived to be internally caused, the same negative event, when it co-occurs with anger, is perceived to be externally caused (Tiedens, 2000). As a result, emotional expressions may be able to shift the attributions that are formed by perceivers for a negative event. In line with this thinking, Tiedens examined whether perceivers' impressions of a target were dependent upon the emotions exhibited. To test this idea, she had participants view one of two video clips of Bill Clinton's testimony to the grand jury regarding the Lewinsky scandal. In one condition, participants viewed an angry Clinton, while in the second condition participants viewed a sad Clinton. Regardless of their political affiliation, participants in the

angry condition rated Bill Clinton much more favorably than those assigned to the sad condition. Although speculative, these findings suggest that emotional expressions may lessen the impact of negative performance cues.

More generally, the message conveyed by Tieden's (2000) work is that, as with performance, emotional expressions are important cues that perceivers use to infer status and leadership. In this regard, Tiedens and her colleagues have examined the interrelationship between emotional expressions and status conferral. For example, in one series of laboratory studies, participants who viewed an angry target rated the target as being of higher status, more powerful, and more competent than participants who viewed a sad target (Tiedens, 2001). Similarly, participants given no information about status assumed an angry individual was an executive and a sad individual was his assistant (Tiedens, Ellsworth, and Mesquita, 2000). Although indirect, Tieden's investigations lend credence to the possibility that emotions are an additional inferential route to leadership perceptions.

Beyond Perception

To this point we have focused upon the perceptions formed by subordinates. However, to understand leadership, we cannot limit ourselves simply to perceptions. Ultimately, leadership is an influence process in which one individual, a leader, through his/her actions changes the way that a second individual, a subordinate, behaves, thinks, or feels. The question we have been exploring is, how does this occur? Another possibility recently outlined by scholars is that a leader's actions transform the manner in which subordinates conceptualize themselves (e.g., Lord et al., 1999; Shamir, House, & Arthur, 1993). Contemporary research suggests that the self is a dynamic, multifaceted memory structure, one that contains far more schema than can be activated at any given moment in time. As a result, only a limited, contextually activated,

number of schemas are salient, a portion typically referred to as the Working Self-Concept (WSC) (Markus & Wurf, 1987). Once activated, it is this WSC that guides our behavior (Banaji & Prentice, 1994). Extending this thinking, Lord and Brown (Lord, Brown, & Freiberg, 1999; Lord & Brown, 2001; Lord & Brown, forthcoming) have proposed that leaders exert their influence over subordinates, and by extension, affect organizational outcomes by activating different portions of a subordinate's WSC. In essence, leaders change the way in which we envision ourselves.

Generally speaking, Lord and Brown (Lord et al., 1999; forthcoming) propose that the self-concept can be divided into three basic levels: individual self, relational self, or collective self. Additionally, they suggest that different leader activities (e.g., behavior) map onto each of these broadly defined dimensions of the self-concept. For instance, in their model they propose that the effect of charismatic, transformational, and self-sacrificial behavioral styles operate through the activation of the collective self-concept. Thus, as a result of engaging in transformational leadership behavior, leaders are able to get group members to redefine themselves in terms of group level characteristics (e.g., group prototype). Coinciding with this prediction, Paul, Costley, Howell, Dorfman, and Trafimow (2001) tested the extent to which alternative leadership styles activate aspects of a perceiver's self-concept. They randomly assigned 353 participants to read one of three written vignettes describing a leader as charismatic, individually considerate, or a combination of the two. After reading about the leader, participants completed a measure of collective self-concept activation. Interestingly, participants exposed to a charismatic leader had significantly higher scores on the collective self-concept measure relative to those in the individual consideration condition. Given the nascent nature of this approach, more work will be needed before firm conclusions can be drawn

regarding what relationship, if any, leader behaviors have with subordinate self-concepts.

Future Directions

Over the past 30 years substantial strides have been made in terms of what we know about how perceivers form leadership impressions. Recent trends, however, suggest that there are many exciting new opportunities and challenges for scholars in this realm. For instance, technology has dramatically transformed the manner in which people communicate with one another in organizations. Technological advances have lessened the need for direct face-to-face interactions between supervisors and subordinates (Avolio, Kahai, Dumdum, Sivasubramaniam, 2001). For the most part, our models and research on leadership perceptions have been based on face-to-face interactions and how perceptions are formed in a virtual environment remains unknown. Similarly, the demographic composition of the workforce has shifted in recent years. Today, visible minorities are the fastest growing component of the labor market, resulting in a greater number of demographically dissimilar supervisor-subordinate dyads. The manner in which leadership perceptions form in such dyads has not been considered, but should become increasingly important as the workplace diversifies. Finally, greater attention must be paid to understanding how perceptions of leadership translate into subordinate actions. Although initial work in this area has begun (e.g., Lord et al., 1999; Lord & Brown, forthcoming; Shamir et al., 1993), more is required if we are to fully understand the mechanism behind a leader's influence.

Implications for Application

This review suggests that the study of leadership can benefit from understanding the information processing of leaders and subordinates. Although our review should not be taken to be exhaustive, it has, we think, highlighted the dominant themes. Our review indicates that the content of the schemas held by leaders and subordinates is essential for understanding leadership

processes. For leaders, schemas are the source of a leader's behaviors (e.g., Wofford & Goodwin, 1994), while for subordinates they are the standards against which these behaviors are compared (e.g., Lord et al., 1984). Additionally, prior research has highlighted that schemas are contextually organized and cued. The behavioral schemas activated by leaders depend upon how subordinates (e.g., Mitchell & Wood, 1980) or the environment are perceived (Chattopadhyay et al., 2001; Dutton & Jackson, 1987). Similarly, perceivers possess multidimensional schemas and different portions of these schemas may be activated (e.g., Lord et al., 1984) or recreated (e.g., Lord et al., 2001).

On the basis of the current information processing and leadership literature, several propositions can be drawn regarding the development of effective leadership. First, to function effectively leaders must understand the implicit theories of leadership that are held by subordinates. As the literature reviewed earlier highlights, leadership is largely in the eye of the beholder, being dependent upon the degree to which an individual fits with the normative definition of leadership that is held within a given context (Lord & Maher, 1991). Second, once understood, the normative definition of leadership must be communicated to organizational leaders. Current thinking on leadership suggests that leaders must regulate their behavior around the commonly understood image of leadership (Gardner & Avolio, 1998). From an information processing viewpoint the ability to generate a leader image among subordinates will be dependent upon the degree to which organizational leaders have acquired the appropriate scripts and person schemas. Third, the information processing perspective suggests that a number of abilities and individual characteristics should be related to who can successfully advance as a leader within a given organization. If, as the literature reviewed earlier highlights, leadership is about knowledge creation, individual differences in the meta-cognitive skills associated with

knowledge acquisition could serve as the foundation for a theoretically based model of leader succession. In this regard, the work of Sternberg and his colleagues (e.g., Cianciolo et al., in press; Sternberg, 2002) might serve as a useful starting point for practitioners.

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