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Vertical Versus Shared Leadership as Predictors of the Effectiveness of Change Management Teams: An Examination of Aversive, Directive, Transactional, Transformational, and Empowering Leader Behaviors

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This study investigated vertical versus shared leadership as predictors of the effectiveness of 71 change management teams. Vertical leadership stems from an appointed or formal leader of a team, whereas shared leadership (C. L. Pearce, 1997; C. L. Pearce & J. A. Conger, in press; C. L. Pearce & H. P. Sims, 2000) is a group process in which leadership is distributed among, and stems from, team members. Team effectiveness was measured approximately 6 months after the assessment of leadership and was also measured from the viewpoints of managers, internal customers, and team members. Using multiple regression, the authors found both vertical and shared leadership to be significantly related to team effectiveness ($p < .05$), although shared leadership appears to be a more useful predictor of team effectiveness than vertical leadership.

The increasing use of empowered teams and concomitant flattening of organizational structures (Mohrman, Cohen, & Mohrman, 1995) brings into question the more traditional models of leadership. What kind of leadership is more appropriate for this new team-based environment? Pearce (1997), Yukl (1998), Pearce and Sims (2000), and Pearce and Conger (in press) have suggested that shared leadership—leadership that emanates from the members of teams, and not simply from the appointed team leader—may provide the answer to this question. Thus, we investigated this issue within the context of change management teams (CMTs). The CMTs in this study are teams that, while not fully self-managing, have a very high degree of decision-making latitude for improving the operations in their respective areas of responsibility. Thus, our results are most applicable to high-autonomy teams that engage in complex tasks, and they may not generalize to traditional work groups. The teams in this study are also all drawn from one organization, which helps to control for situational variables that might influence team effectiveness (e.g., organizational culture) but may limit the generalizability to alternate organizational contexts. More specifically, we explored how the behavior of the appointed team leaders (vertical leadership) versus distributed influence from within the team (shared leadership) accounted for the effectiveness of the CMTs.

In this article, we briefly review the behavioral model of leadership that forms the basis of this study and then review literature related to the shared leadership process. We offer several hypotheses regarding the potential role of team leadership in team effectiveness. Subsequently, we describe our methods, present our results, and offer a discussion and conclusion.

Leadership Theoretical Development

Our theoretical model of leadership is founded on the conceptual and empirical work centered on transactional and transformational leadership (e.g., Bass & Avolio, 1993) and, more precisely, on the work of Sims and colleagues (e.g., Cox & Sims, 1996; Manz & Sims, 1991; Sims & Manz, 1996), who articulated a model of lead-

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ership made up of four types: (a) directive, (b) transactional, (c) transformational, and (d) empowering. Our model also integrates research from the consideration–initiating structure paradigm and the transactional–transformational paradigm. We also drew inspiration from path goal theory (e.g., House, 1971; House & Dessler, 1974; House & Mitchell, 1974) in articulating a multitype model of leadership, and we build on the work of Yukl (1987) and Quinn (1988). Using empirical analyses, Pearce et al. (2001) examined three independent data sets and concluded that the directive component of the Sims and colleagues' model may be more accurately portrayed with two components: one that is directive in nature and a second that is aversive in nature. Thus, our theoretical development begins with the following five types of leader behavior: (a) aversive, (b) directive, (c) transactional, (d) transformational, and (e) empowering. The fundamental theoretical and research bases of this model are derived from an analysis of the leadership literature. These roots are summarized in Table 1 and are described in greater detail below.

Aversive Leadership

The first behavioral type in our model is aversive leadership. The aversive leadership behavioral type describes leadership that primarily relies on coercive power (French & Raven, 1959) and is rooted in punishment research (e.g., Arvey & Ivancevitch, 1980). Kazdin (1975) defined punishment as "the presentation of an aversive event or the removal of a positive event following a response which decreases the frequency of that response" (pp. 33–34). Noncontingent reprimand tends to yield negative impact on subordinate satisfaction but has little effect on performance, and contingent punishment has little effect on subordinate performance (Cox, 1994). Representative behaviors of aversive leadership include (a) engaging in intimidation and (b) dispensing reprimands.

Directive Leadership

The second behavioral type in our model is directive leadership. The directive leadership behavioral type describes leadership that primarily relies on position power, which at times

Table 1
Theoretical Bases and Representative Behaviors of Five Types of Leader Behavior

Leader type	Theoretical bases	Representative behaviors
Aversive leadership	Punishment research (e.g., Arvey & Ivancevitch, 1980)	Engaging in intimidation Dispensing reprimands
Directive leadership	Theory X management (McGregor, 1960) Initiating structure behavior from Ohio State studies (e.g., Fleishman, 1953) Task-oriented behavior from Michigan studies (e.g., Bass, 1967)	Issuing instructions and commands Assigning goals
Transactional leadership	Expectancy theory (e.g., Vroom, 1964) Equity theory (e.g., Adams, 1963) Path goal theory (e.g., House, 1971) Exchange theory (e.g., Homans, 1958)	Providing personal rewards Providing material rewards Managing by exception (active) Managing by exception (passive)
Transformational leadership	Sociology of charisma (e.g., Weber, 1946, 1947) Charismatic leadership (e.g., House, 1977) Transforming leadership (e.g., Burns, 1978) Transformational leadership (e.g., Bass, 1985)	Providing vision Expressing idealism Using inspirational communication Having high performance expectations
Empowering leadership	Behavioral self-management (e.g., Thorenson & Mahoney, 1974) Social cognitive theory (e.g., Bandura, 1986) Cognitive behavior modification (e.g., Meichenbaum, 1977) Participative goal setting (e.g., Locke & Latham, 1990)	Encouraging independent action Encouraging opportunity thinking Encouraging teamwork Encouraging self-development Participative goal setting Encouraging self-reward

has been referred to as legitimate power (cf. French & Raven, 1959). The roots of the directive leadership behavioral type lie in Theory X management style (McGregor, 1960), initiating structure types of leader behavior from the Ohio State studies (e.g., Fleishman, 1953; Halpin & Winer, 1957) and the task-oriented types of leader behavior from the Michigan studies (e.g., Katz, Maccoby, & Morse, 1950). Theory X leadership emphasizes the need to provide direction to subordinates. The Ohio State and Michigan studies both defined a type of leadership that involved planning and organizing subordinates' roles and responsibilities. Thus, these three theoretical traditions provide the bases of directive leadership. Representative behaviors of the directive leadership type include (a) issuing instructions and commands and (b) assigning goals.

Transactional Leadership

The third behavioral type in our model is transactional leadership. The transactional leadership behavioral type is generally consistent with the components of the transactional–transformational paradigm of leadership. The bases of this type lie in expectancy theory (Vroom, 1964), exchange/equity theory (Adams, 1963; Homans, 1958, 1961), and reinforcement theory (Luthans & Kreitner, 1985; Scott & Podsakoff, 1982). According to expectancy theory, with a cognitive-rational model of human behavior, individuals assess situations according to three variables: (a) valence, the attractiveness of potential outcomes for engaging in certain behaviors; (b) instrumentality, the perceived linkage between a behavior and the outcome; and (c) expectancy, the perceived likelihood of effort resulting in the behavior necessary to obtain the outcome. Subsequently, individuals engage in behaviors that will maximize their expected return from performance. In line with expectancy theory, transactional leadership is focused on clarifying the effort–reward relationships, using reward systems to achieve maximal motivation.

Homans (1961) and Adams (1963) are generally credited with the development of the exchange or equity group of theories. Although several versions exist, the basic tenet of this class of theories is that individuals seek to maintain equity between what they give vis-à-vis what they obtain in an exchange (Landy, 1985; Pinder, 1984). On the basis of this theory of motivation, prescriptions are made for leadership. The prescriptions center on motivating subordinate performance by providing equitable rewards for inputs, and thus predict that higher levels of subordinate input can be generated through higher levels of reward. Therefore, this class of motivation theories serves as another basis for the transactional leadership behavioral type.

Reinforcement theory is summarized by the law of effect (Thorndike, 1911), which suggests that the consequence of a behavior is an important determinant of whether the behavior will be repeated. Using the law of effect, transactional leader behavior influences subordinate behavior by reinforcing (rewarding) those behaviors that are desired (Luthans & Kreitner, 1985; Sims, 1977).

Thus, expectancy theory, equity theory, and reinforcement theory serve as the bases of transactional leadership. Representative behaviors of transactional leadership include (a) providing personal rewards, (b) providing material rewards, (c) managing by exception (active), and (d) managing by exception (passive).

Transformational Leadership

The fourth behavioral type in our model of leadership is transformational leadership. This behavioral type is similar to the transactional–transformational paradigm, but as Bryman (1992) noted, there is some conceptual diversity as to the precise definition of transformational leadership. The historical bases of the transformational leadership behavioral type are drawn from the sociology of charisma (Weber, 1946, 1947), charismatic leadership theory (House, 1977), and transforming/transformational leadership (Bass, 1985; Burns, 1978).

House (1977) addressed in his article "A 1976 Theory of Charismatic Leadership" a long-standing gap in the formal study of leadership. House's viewpoints have continued to develop, and later revisions of the theory (House, Howell, Shamir, Smith, & Spangler, 1993; House & Shamir, 1993) proposed that charismatic leaders engage in the following be-

haviors in order to achieve charismatic effects: (a) impression management, (b) articulation of ideological goals, (c) definition of subordinate roles in terms of ideological values, (d) role modeling, (e) communication of high expectations and confidence in subordinates, and (f) engagement in behavior designed to arouse appropriate follower motives.

Burns (1978) more clearly explicated a distinction between transactional and what he termed *transforming leadership behaviors*. Bass and colleagues (e.g., Avolio & Bass, 1988; Bass, 1985, 1990, 1998; Bass, Avolio, & Goodheim, 1987; Hatter & Bass, 1988; Waldman, Bass, & Einstein, 1987; Yammarino & Bass, 1990) operationalized and empirically tested Burns's leadership concepts under the label of *transformational leadership*. Bass also extended Burns's (1978) model by including leaders who do not necessarily appeal to only higher moral values. The behaviors contained in Bass's (1998) model include (a) charismatic leadership (or idealized influence), (b) inspirational motivation, (c) intellectual stimulation, and (d) individualized consideration. Thus, these three theoretical traditions form the bases of transformational leadership. Representative behaviors of this type include (a) providing vision, (b) expressing idealism, (c) using inspirational communication, (d) having high performance expectations, (e) challenging the status quo, and (f) providing intellectual stimulation.

Empowering Leadership

The fifth behavioral type in our model of leadership is empowering leadership. Empowering leadership emphasizes the development of follower self-management or self-leadership skills. In the popular media, Manz and Sims (1989, 1991, 2001) have called this type of leadership "SuperLeadership," or leading others to lead themselves. The historical bases of empowering leadership are found in behavioral self-management (e.g., Thorenson & Mahoney, 1974), social cognitive theory (e.g., Bandura, 1986), cognitive behavior modification research (e.g., Meichenbaum, 1977), and participative goal-setting research (e.g., Erez & Arad, 1986). Behavioral self-management has its roots in clinical psychology (e.g., Mahoney & Arnkoff, 1978). Manz and Sims (1980) expanded the clinical applications to organizations by defining self-management as a substitute for leadership.

The basic proposition of social cognitive theory is that of triadic reciprocality (Bandura, 1986). According to triadic reciprocality, *individuals* influence their *environment* through their *behavior*, both of which (environment and behavior), in turn, influence the individual. One of the key contributions of social cognitive theory is a framework for understanding how modeling influences individual behavior. In terms of the empowering leadership behavioral type, it is proposed that the leader models appropriate self-leadership behavior, which is subsequently adopted by the subordinate. Similar to social cognitive theory, cognitive behavior modification research has focused on "conceptualiz[ing] cognitive events and . . . understand[ing] their role in behavior change" (Meichenbaum, 1977, p. 11). Cognitive behavior modification is similar to the cognitive self-leadership strategies of SuperLeadership, such as the strategy of reconceptualizing performance obstacles not as problems but rather as opportunities for learning (Manz & Sims, 1989, 2001), thus providing another basis of the empowering leadership behavioral type.

Finally, Locke and Latham (1990) reviewed 25 years of goal-setting research. The major findings indicate that specific, difficult goals lead to higher performance, and that, in general, it does not matter if the goals are participatively or unilaterally set. Erez and her colleagues (e.g., Erez & Arad, 1986) have found some instances in which participatively set goals can lead to higher performance and satisfaction. While the directive leadership behavioral type includes assigning goals, the empowering leadership behavioral type emphasis on developing subordinate self-leadership skills is more in keeping with participative goal setting, as in the case of an ideal management by objectives system (cf. Drucker, 1954).

Thus, these four theoretical traditions provide the bases of the empowering leadership type. Representative behaviors of this type include (a) encouraging independent action, (b) encouraging opportunity thinking, (c) encouraging teamwork, (d) encouraging self-development, (e) using participative goal setting, and (f) encouraging self-reward.

Summary

Bass and Avolio (1993) stated that one of the major problems in the study of leadership is that there is a tendency to discount previously existing theories in an effort to introduce a "new way of thinking." We agree. In this section, we attempt to build on multiple theoretical and empirical lines from the leadership literature, and we also attempt to build on, and extend, the current leadership paradigm rather than discount and discard it in the development of our deductively derived model of the behavioral types of leadership.

Shared Leadership: An Alternate Source of Team Influence

The study of leader behavior has typically focused on the behavior of the appointed or elected leader of some group or organization (cf. Bass, 1990). However, this is not to say that leadership cannot emerge from a context and be demonstrated by members (other than the designated leader) of the group or organization (Ensley, Pearson, & Pearce, in press; Manz & Sims, 1987, 1993; Pearce & Conger, in press; Pearce, Perry, & Sims, 2001; Pearce & Sims, 2000; Perry, Pearce, & Sims, 1999; Seers, 1996). In his recent book, Yukl (1998) has given new emphasis to this distributed—group process—form of leadership, what he calls "shared leadership" (p. 368), which is most likely to be found in voluntary or empowered teams (Pearce et al., 2001).

Several decades of research on vertical leadership have identified a range of leadership behaviors that serve as currency in the exchange of influence among leaders and followers (e.g., Bass, 1990; Yukl, 1998). In shared leadership contexts, these strategies continue to be relevant, with one important caveat: The agents of influence are often *peers* of the targets of influence. Although vertical leaders continue to play a significant role in developing and maintaining shared leadership, lateral influence among peers, shared leadership, should play an important role in explaining team dynamics and team effectiveness (e.g., Avolio, Jung, Murry, & Sivasubramaniam, 1996; Pearce & Conger, in press; Pearce & Sims, 2000; Yukl, 1998).

The notion of shared leadership is deeply rooted in the organizational literature. Perhaps one of the first to write about leadership coming from sources other than the designated leader was Mary Parker Follet. She wrote that one should not merely look to the designated leader for guidance, but rather that one should let logic dictate to whom one should look for guidance on the basis of individuals' knowledge of the situation at hand (Follet, 1924). While she did not expressly write on the idea of shared leadership, per se, she clearly suggested that the situation, not the individual, provides the basis for leadership.

Other authors have explored the concept of emergent leadership. The concept of emergent leadership primarily refers to the phenomenon of leader selection, by the members, from a leaderless group (e.g., Bartol & Martin, 1986; Hollander, 1974; Stein & Heller, 1979). While emergent leadership is typically concerned with the ultimate selection of an appointed leader, the concept of shared leadership might be thought of as "serial emergence" of multiple leaders over the life of a team. Thus, emergent leadership is a second theoretical base of shared leadership.

The substitutes for leadership literature (e.g., S. Kerr & Jermier, 1978; Yukl, 1998) also provides a useful framework for understanding the concept of shared leadership. The substitutes for leadership literature suggests that certain conditions such as highly routinized work or professional standards may serve as substitutes for social sources of leadership. In this sense, shared leadership may serve as a *substitute* for more formal appointed leadership. For example, if team members are actively involved in developing the vision for their team, then it may be possible that a strong visionary leader is not necessary for the team to focus on its distal goals. Manz and Sims (1980) brought forward a similar point, at the individual level, in their article, "Self-Management as a Substitute for Leadership." Therefore, the substitutes for leadership serve as a third theoretical base of shared leadership.

Work on empowerment and self-managed teams has expressly acknowledged the role of team members in leadership (e.g., Dumaine, 1994; Manz & Sims, 1993). In fact, Manz and Sims and colleagues (e.g., Manz & Sims, 1989) described a type of leadership in which the primary objective of the leader is the development of the self-leadership abilities of follow-

ers. Thus, research on empowerment and self-managed teams provides a fourth theoretical base of shared leadership.

Unfortunately, although it has been recognized that team members can, and do, take on leadership roles (see Manz & Sims, 1993), and thus provide an alternate social source of leadership, the empirical examination of this alternate source of leadership has been relatively unexplored. With the exception of Bowers and Seashore (1966), who found and termed *mutual leadership* among life insurance agents to be predictive of the types of insurance sold and the cost per unit of new policies, and Avolio et al. (1996), who found shared leadership in teams of undergraduate students to be positively correlated with self-reported ratings of effectiveness, shared leadership has received relatively little empirical attention.

Hypotheses: Vertical Versus Shared Leadership

It seems likely that both social sources of leadership should have important causal impacts on team effectiveness; however, the precise nature of these relationships is unclear. Therefore, the purpose of this research was to examine each source, both independently and jointly, to tease out the empirical nature of their various relationships with CMT effectiveness.

The importance of this issue was highlighted by Yukl (1998), who designated the most important current controversy as "heroic vs. shared leadership" (p. 504), which was echoed by Pearce and colleagues under the terminology of *vertical versus shared leadership* (e.g., Pearce, 1997; Pearce & Conger, in press; Pearce et al., 2001; Pearce & Sims, 2000). Yukl stated the following: "The extent to which leadership can be shared, . . . the success of shared leadership, and the implications [of shared leadership] for design of organizations are important and interesting questions that deserve more research. As yet, we have only begun to examine these research questions" (p. 504). Thus, the hypotheses investigated in this research are more formally stated as follows:

> Hypothesis 1: Vertical leadership is an important predictor of team effectiveness.
>
> Hypothesis 2: Shared leadership is an important predictor of team effectiveness.

Although we expected both sources of leadership to be important predictors of team effectiveness, we had no strong conceptual or empirical rationale to predict which source might have a stronger influence. However, this is a research question worthy of investigation. Thus, later in the analyses, we explored the relative usefulness of each source in the explanation of the variance in team effectiveness.

In addition, we examined the relationships between the various strategies or types of leader behavior and team effectiveness. We expected to find the following, for both vertical and shared leadership:

> Hypothesis 3: Aversive leadership is negatively related to team effectiveness.
>
> Hypothesis 4: Directive leadership is negatively related to team effectiveness.
>
> Hypothesis 5: Transactional leadership is positively related to team effectiveness.
>
> Hypothesis 6: Transformational leadership is positively related to team effectiveness.
>
> Hypothesis 7: Empowering leadership is positively related to team effectiveness.

Finally, larger groups are generally found to be less effective on a number of criteria (Levine & Moreland, 1990) than smaller groups. Furthermore, N. L. Kerr (1989); Markham, Dansereau, and Alutto (1982); and Pinto and Crow (1982) all found members of larger groups to be less satisfied, participate less, and cooperate less than members of smaller groups. Coordination problems and social loafing have been found to be more prevalent in larger groups (Albanese & Van Fleet, 1985; Gooding & Wagner, 1985; Harkins & Szymanski, 1987). Thus, team size may be a covariate of leadership and team effectiveness and was, therefore, included in this study as a control variable.

Method

Participants and Procedures

Research was conducted at a large automotive manufacturing firm located in the mid-Atlantic United States. The sample consisted of 71 CMTs. The research design incorporated the following time lag: leadership measures were collected at Time 1, and effectiveness measures were collected approximately 6 months later at Time 2. This lag enhances the ability to inter-

pret the results by reducing potential concerns over temporal causality confronted with cross-sectional research.

The participants in the research were all members of CMTs. The team members in this study were relatively homogenous. The average age of team members was 49.56 years, with a standard deviation of 6.91 years. Nearly all participants were men (97.5%), and most had long tenure with their organization ($M = 24.57$ years, $SD = 8.16$) and with their respective teams ($M = 15.32$ months, $SD = 10.26$). Team size varied considerably, with a mean of 7.24 ($SD = 2.73$).

The CMTs in this research had been implemented in this organization as part of a total quality management effort. The shift to this team-based organization was dramatic. In the mid- to late-1980s, the organization experienced severe labor management disputes. In fact, the situation deteriorated so badly that the organization experienced three bomb threats and a murder/suicide attempt. Following these incidents, the organizational leadership, both management and union, pushed for closer cooperation and teamwork. Thus, the organization began a move toward a more team-based approach in the early to mid-1990s and began implementation of CMTs as a means of empowering and involving all organizational members in the development of their collective destiny. This afforded us the unique opportunity to study an organization in transition. According to the union president, "Prior to this program common sense never entered into the picture. It was 'do it the way we're telling you to do it because we're the managers and you are the employees'. . . [Now] we are all working together." Thus, the context could be described as a large-scale organization change situation. As such, our results are most applicable to similar situations and may not generalize to more traditional work groups.

The CMTs in this research were cross-functional and highly interdependent. The organizational leaders used a conscious strategy of creating teams that drew on the diverse skills of the workforce. The CMTs were also semipermanent. In other words, they were not temporary task forces with only one task to achieve. Rather, they were expected to initiate and contribute new ideas for enhanced productivity, product quality, and quality of work life—on an ongoing basis. Although the CMTs were not entirely self-managing, they were at an advanced form of empowerment and had considerable autonomy in their own spheres of operations. Thus, they were not only responsible for identifying opportunities for positive change in the organization, but were also expected to implement said changes and to continue to find new opportunities for positive change.

Team leaders viewed their new roles from a variety of perspectives. One stated that "my most important role is for building the team—getting them to interact without being directed"; another team leader claimed that "you have to play cheerleader sometimes [and] you have to be careful not to be a dictator." One team leader, however, summed up his new role best: "I have told them [the team members] their goal is to replace me." These comments and other team leader and team member observations and comments, from our initial exploratory qualitative data gathering meetings, pointed us in the direction of investigating the role of shared leadership in CMT effectiveness.

The overall purpose of this study was to examine the leadership of the CMTs and to make recommendations to the organization regarding factors on which to focus to enable future development of the success of its team-based approach. To facilitate this analysis, we collected data from three sources: (a) managers to whom the teams reported, (b) internal customers of team output, and (c) team members.

The data collection process was intensely managed with a researcher on site during the administration of questionnaires. To minimize the organizational disruption of data collection, a random subset of team members received questionnaires at Time 1. All respondents were informed that their responses were confidential, would not be shared with anyone from the organization, and would be reported only in ways that could not be linked to individual respondents. All questionnaires were completed during normal business hours, and all respondents were given envelopes in which to seal their completed questionnaires. Of the 236 team members who received the questionnaire at Time 1, 197 returned usable questionnaires, for a response rate of 83%. At the team level of analysis, usable data were obtained on all measures for 69 of the 71 teams at Time 1, for a response rate of 97%. Time 2 response rates

were somewhat lower, with manager ratings data for 49 teams (69%), internal customer ratings data for 51 teams (72%), and team self-ratings data for 47 teams (66%).

Managers to whom teams reported were identified through interviews with the team leaders and with management. Whereas team leaders were participants in their teams, the managers were located at a higher organizational level and had oversight responsibility for the teams. Additionally, when appropriate, we collected multiple managers' ratings of a particular team's effectiveness to enable the examination of the level of agreement on managerial ratings. The mean number of managerial ratings per team was 1.28, and the standard deviation was 0.63. These individuals were asked to complete a 26-item questionnaire for each of the CMTs for which they had some type of oversight responsibility. This questionnaire was administered on site to each of the identified managers. This questionnaire was administered during Time 2.

Internal customers of team output were identified through interviews with team leaders and with management. As with managerial ratings, when appropriate, we collected multiple internal customers' ratings of a particular team's effectiveness. The mean number of internal customer ratings per team was 1.56, and the standard deviation was 0.71. These customers were asked to complete the same 26-item questionnaire on specific target teams' effectiveness. This questionnaire was administered on site to each of the identified customers. This questionnaire was administered during Time 2.

Team members were identified though examination of company records and interviews with team leaders. This group of individuals was asked to complete questionnaires on (a) leader behavior (vertical/shared) and (b) team effectiveness. The leadership questionnaire was administered during Time 1, and the effectiveness questionnaire was administered during Time 2.

Measures

All measures, with the exception of team size, were collected with a 5-point scale with the following responses: 1 (*definitely not true*), 2 (*not true*), 3 (*neither true nor untrue*), 4 (*true*), and 5 (*definitely true*). To assess internal consistency of each scale, the Cronbach alpha procedure (Cronbach, 1951) was used; to assess the appropriateness of aggregating individual responses to the team level, the James, Demaree, and Wolf (1984) procedure ($r_{WG(J)}$) was used. This procedure produces a measure of consensus among respondents, and it "provides the justification for aggregation" (Koslowski & Hattrup, 1992, p. 162).

Leader behavior. Team member perceptions of leader behavior exhibited by respective team leaders and team members were elicited with a leader behavior questionnaire. This questionnaire was formatted such that individuals responded to each item twice: once for their team leader (vertical leadership) and once for their team members as a whole (shared leadership). The questionnaire items are provided in Appendix A.

The first step in developing the leader behavior questionnaire used in this research was to begin with a questionnaire used by Cox (1994) and Cox and Sims (1996), which was further analyzed by Pearce et al. (2001). The Pearce et al. analysis suggested the existence of five leader behavior strategies (aversive, directive, transactional, transformational, and empowering). We also integrated some items from other leadership researchers, when appropriate, to extend the range of behaviors examined in this research. The following leader behavior scales were obtained from R. J. House (personal communication, March 12, 1994): (a) having high performance expectations and (b) using inspirational communication. The following leader behavior scales were obtained from B. J. Avolio (personal communication, February 17, 1994): (a) managing by exception (active), (b) managing by exception (passive), and (c) providing intellectual stimulation. We also developed a leader behavior scale to reflect Yukl's (1994) notion of encouraging self-development.

Items were slightly modified to reflect the unique aspect of the research site. For example, phrases such as "colleagues" were changed to "team members." Additionally, the questionnaire was structured to allow participants to respond to the same question in reference both to vertical leader behavior and to shared leader behavior. A similar double response format has been used successfully in previous research to measure leadership from an external source versus an internal source (cf. Manz & Sims, 1987).

Because of the large number of items in the study, we utilized principal-components analy-

sis with varimax rotation in order to select final working dimensions of leader behavior strategies. A factor analysis was conducted at the item level, with data from individual respondents nested in the teams; scales were constructed by unit-weighting the items from these factors. While the use of exploratory factor analysis with nested data suggests that the solution should be interpreted with caution, the factor structure is generally consistent with previous results found in other studies reported by Pearce et al. (2001). These scales were then examined for internal consistency reliability and interrater consensus within the CMT unit of analysis.

To facilitate the direct comparison of vertical and shared leadership, one of the objectives in constructing the final working dimensions of leadership was to arrive at a factor solution that produced identical factors for both vertical and shared leadership. Therefore, an iterative process was implemented to arrive at the final working dimensions. First, scree plots were examined for both vertical and shared leadership. Second, constraints were placed on the number of factors to be estimated from each data set, and the results were compared across vertical and shared leadership. Third, items with strong secondary loadings were deleted. Finally, a few items that produced different loading structures between vertical and shared leadership were deleted where theoretical integrity was not compromised.

Team size. Team size was a measure of the number of individuals in each team. These data were obtained from company records and interviews with team leaders.

Team effectiveness. Goodman, Ravlin, and Schminke (1987) called for the use of fine grained measures of group performance that are related to the tasks of the group. Gladstein (1984) found that ratings of group performance differ, depending on the source of the ratings (e.g., managers vs. group members). In this research, we assessed team effectiveness with seven a priori variables: (a) output effectiveness, (b) quality effectiveness, (c) change effectiveness, (d) organizing and planning effectiveness, (e) interpersonal effectiveness, (f) value effectiveness, and (g) overall effectiveness. These dimensions are an integration of the process and performance measures from Ancona and Caldwell (1992), and the effectiveness measures are from Manz and Sims (1987) and Cox (1994); they are shown in Appendix A. These dimensions were assessed from three sources: (a) managers, (b) internal customers, and (c) team self-ratings. All three sources responded to the same questionnaire.

The 26 original items were subjected to exploratory factor analysis at the individual level of analysis. Consistent with Ancona and Caldwell (1992), in no case did a solution suggest that there was more than one factor present. Subsequently, all items were combined to form one overall scale of effectiveness. The internal consistency reliability of this combined scale was $\alpha = .98$ (for managerial ratings), $\alpha = .98$ (for internal customer ratings), and $\alpha = .85$ (for team self-ratings). For teams that had multiple respondents, the mean $r_{WG(J)}$ for this combined scale was .96 (for managerial ratings), .80 (for internal customer ratings), and .92 (for team self-ratings), indicating high levels of agreement within each rating source regarding target teams' effectiveness. Moreover, all three sources were positively and significantly correlated with one other (team self-ratings and manager ratings, $r = .38$, $p < .01$; team self-ratings and internal customer ratings, $r = .52$, $p < .01$; and manager ratings and internal customer ratings, $r = .45$, $p < .01$), suggesting agreement between rating sources. Thus, this combined scale, comprising all items in the team effectiveness questionnaire, was used later in the hypothesis testing phase of this research.

Data Analysis

Multiple regression analysis was used to examine the relationship between vertical and shared leadership and the subsequent measures of effectiveness of the CMTs in this study. First, we examined the relationship between the five vertical leadership behaviors and CMT effectiveness (Hypothesis 1). Next, we examined the relationship between the five shared leadership behaviors and CMT effectiveness (Hypothesis 2). Finally, using usefulness analysis with hierarchical multiple regression (Farh, Podsakoff, & Organ, 1990), we examined the relative usefulness of vertical and shared leadership in explaining the effectiveness of the CMTs by alternating the order of entry of variables into the overall regression equation. In all regression

equations, team size was entered as a control variable.

We also examined the explanatory value of the specific leader behaviors by examining beta weights of the regression analyses. However, multicollinearity among the predictor leadership dimensions prevented examination of all the variables simultaneously. We, therefore, examined two regression models for each of our measures of team effectiveness. In each of these models, team size was entered as a control variable. The first set of equations examined the relationships between the five vertical leader behaviors and the measures of team effectiveness. The second set of equations examined the relationships between the five shared leader behaviors and the measures of team effectiveness.

Results

Preliminary Analyses

Means, standard deviations, and intercorrelations among the study variables are shown in Appendix B. The final first-order factor structure for vertical and shared leadership is presented in Appendix C. This structure was generally consistent with the a priori structure.

Factor 1 consisted of three challenging the status quo items, three providing vision items, three expressing idealism items, two using inspirational communication items, two having high performance expectations items, and three managing by exception (passive) items. All items were a priori categorized as transformational leadership indicators, with the exception of the managing by exception items (which all had negative loadings on Factor 1). This factor was labeled *Transformational Leadership*.

Factor 2 consisted of three issuing instructions and commands items, three assigning goals items, and three participative goal-setting items. With the exception of the participative goal-setting items, all items were a priori categorized as directive leadership indicators. This factor was labeled *Directive Leadership.*

Factor 3 consisted of providing material rewards items, one providing personal rewards item, and three encouraging self-reward items. With the exception of the encouraging self-reward items, all items were a priori categorized as transactional leadership indicators. This factor was labeled *Transactional Leadership*

Factor 4 consisted of two engaging in intimidation items, three dispensing reprimands items, and two managing by exception (active) items. With the exception of the managing by exception (active) items, all items were a priori categorized as aversive leadership indicators. This factor was labeled *Aversive Leadership.*

Factor 5 consisted of four encouraging independent action items, one encouraging opportunity thinking item, and one encouraging self-development item. All items were a priori categorized as empowering leadership indicators. This factor was labeled *Empowering Leadership.*

Reliability for each scale was equal to or greater than .72 and is presented at the bottom of the factor analysis. The mean $r_{WG(J)}$ for each scale was equal to or greater than .84 and is also presented at the bottom of the factor analysis.

Analyses of Outcome Variables

Note that team size was included as a control variable and thus was entered in Step 1 of all the regression models. Therefore, for Hypotheses 1 and 2, it is the change in R^2 after the effect of team size that is the relevant statistic.

We first examined the overall relationship between the five vertical leadership behaviors and CMT effectiveness by using multiple regression analysis. The results of the three multiple regression models, one for each of the measures of team effectiveness, are found in the upper part of Table 2. The appropriate test statistics for Hypothesis 1, which stated that vertical leadership would be an important predictor of team effectiveness, are the ΔR^2 statistics found on the second line of the table. The ΔR^2 for the model of managerial ratings of effectiveness was .21, $\Delta F(6, 37) = 1.63$, $p = .17$, the ΔR^2 for internal customer ratings was .08, $\Delta F(6, 39) = 0.97$, $p = .44$, and the ΔR^2 for team self-ratings was .45, $\Delta F(6, 38) = 4.43$, $p = .00$. Thus, providing some support for Hypothesis 1, the five vertical leadership behaviors explained significant amounts of variance in subsequent team self-ratings of team effectiveness. Additionally, Table 2 reports the percentage of total variance explained in each step of the regression equations in comparison to the amount of the total variance explained by the overall equation.

We next examined the relationship between the five shared leadership behaviors and CMT

Table 2
Hierarchical Regression Analysis of the Relative Contributions of the Five Vertical and Five Shared Leadership Behaviors to the Variance Explained by the Full Model

			Managerial ratings			Customer ratings			Self-ratings		
Line	Step	Independent variable	R^2	ΔR^2	Total variance (%)	R^2	ΔR^2	Total variance (%)	R^2	ΔR^2	Total variance (%)
1	1	Team size	.00	.00	0	.16**	.16**	36	.02	.02	3
2	2	Five vertical leadership behaviors	.21	.21	53	.24†	.08	18	.47**	.45**	76
3	3	Five shared leadership behaviors	.40†	.19†	48	.44*	.20†	45	.59**	.12†	20
4	1	Team size	.00	.00	0	.16**	.16**	36	.02	.02	3
5	2	Five shared leadership behaviors	.25†	.25*	63	.34**	.18†	41	.54**	.52**	88
6	3	Five vertical leadership behaviors	.40†	.15	38	.44*	.10	23	.59**	.05	8

Note. Because of rounding error, the R^2 of the "preceding" step plus ΔR^2 of the "current" step may not equal the R^2 of the "current" step, and the percentage of total variance may not equal 100. The percentage of total variance refers to the amount of the total variance explained in each step of the equation compared to the total equation.
† $p < .10$. * $p < .05$. ** $p < .01$.

effectiveness by using multiple regression analysis. The results of the three multiple regression models, one for each of the measures of team effectiveness, are found in the lower part of Table 2. The appropriate test statistics for Hypothesis 2, which stated that shared leadership would be an important predictor of team effectiveness, are the ΔR^2 statistics found in the fifth line of the table. The ΔR^2 for the model of managerial ratings of effectiveness was .25, $\Delta F(6, 37) = 2.47$, $p = .05$; the ΔR^2 for internal customer ratings was .18, $\Delta F(6, 39) = 1.83$, $p = .09$; and the ΔR^2 for team self-ratings was .52, $\Delta F(6, 38) = 5.10$, $p = .01$. Thus, supporting Hypothesis 2, the five shared leadership behaviors also explained significant amounts of variance in subsequent ratings of team effectiveness.

However, an important component of this research was determination of the *relative* usefulness of vertical and shared leadership in predicting CMT effectiveness. To do this, hierarchical regression models were specified, in which the order of entry for vertical and shared leadership was manipulated and examined for each of the dependent variables (managerial ratings, internal customer ratings, and team self-ratings of effectiveness) in the study. The appropriate test statistics for this comparison are the ΔR^2 statistics found in the third line (for shared leadership) in comparison to the ΔR^2 statistics found in the sixth line (for vertical leadership). In no case did the five vertical leadership behaviors contribute a significant increase in R^2 in the equations, whereas in every case the five shared leadership behaviors contributed a marginally significant increase in R^2 in the equations. In summary, while both vertical and shared leadership were important predictors of team effectiveness (Hypotheses 1 and 2), shared leadership was the more useful predictor.

We also wished to examine the relationships between the five types of leader behaviors and team effectiveness—Hypotheses 3–7. Because we found a high degree of multicollinearity among the leadership dimensions, we examined two sets of regression models that controlled for team size. The first set of models examined the relationships between the five vertical leader behaviors and team effectiveness (summary statistics for these models are reported on the second line of Table 2). The second set of models examined the relationships between the five shared leader behaviors and team effectiveness (summary statistics for these models are re-

ported on the fifth line of Table 2). These relationships are shown in Table 3.

Both vertical aversive leadership and shared aversive leadership were negatively related to team self-ratings of team effectiveness ($p < .01$), thus providing some support for Hypothesis 3. Vertical directive leadership was negatively related to managerial ratings of team effectiveness ($p < .05$), and shared directive leadership was negatively related to managerial and internal customer ratings of team effectiveness ($p < .10$ and $p < .05$, respectively), thus providing partial support for Hypothesis 4. Hypothesis 5, relating transactional leadership to team effectiveness, was not supported. Vertical transformational leadership was positively related to managerial ($p < .05$) and self-ratings ($p < .01$) of team effectiveness, and shared transformational leadership was positively related to all three ratings of team effectiveness ($p < .05$, $p < .10$, and $p < .05$, respectively), thus providing partial support for Hypothesis 6. Shared empowering leadership was positively related to team self-ratings of team effectiveness ($p < .10$), thus providing marginal support for Hypothesis 7.

Initially, we wanted to examine the interaction effects between the various vertical and shared leader behaviors. The first way we attempted to examine the interaction effects was to enter our control variable in the model, add the five vertical leader behaviors and the five shared leader behaviors, and then add the five interaction terms (e.g., Vertical Aversive × Shared Aversive, and so forth). As might be expected, because of the lack of degrees of freedom and multicollinearity, none of the beta weights in these models were significant. We next attempted to scale back the number of variables in the model and modeled just one interaction term at a time. In no case were any of the interaction terms significant. Finally, we conducted a second-order factor analysis of the vertical leader behaviors and the shared leader behaviors. Using factor scores regression, we created one composite variable for the five vertical leadership behaviors and one composite variable for the five shared leadership behaviors. Thus, in turn, these variables were used to create one interaction term. Using team size as a control, we subsequently entered the variables representing vertical leadership, shared leadership, and their interaction into a model. Although this model did not suffer from a lack of degrees of freedom, it did suffer from multicollinearity; the interaction term was not significant. In the end, degrees of freedom and multicollinearity prevented the proper analysis of the possible interaction of vertical and shared leadership. This does not necessarily mean that there is no interaction effect between vertical and shared leadership. We believe that this is an important area for future inquiry.

Table 3
Standardized Beta Weights for Regression Equations With Three Effectiveness Rating Sources

Leadership behavior	Manager	Customer	Team
Vertical			
Team size	−.06	−.42**	−.31*
Aversive leadership	.16	.05	−.71**
Directive leadership	−.55*	−.32	.15
Transactional leadership	.26	.23	−.04
Transformational leadership	.45*	.20	.63**
Empowering leadership	−.12	.02	.05
Shared			
Team size	−.09	−.51**	−.26*
Aversive leadership	.26	.12	−.48**
Directive leadership	−.30†	−.40*	.09
Transactional leadership	.04	.14	−.12
Transformational leadership	.42*	.32†	.38*
Empowering leadership	.08	.20	.29†

† $p < .10$. * $p < .05$. ** $p < .01$.

Discussion

The most important finding of this research is that shared leadership was found to be an important predictor of team effectiveness. These results show that a conscious strategy of distributing leadership to team members is likely to enhance team effectiveness.

We also addressed Yukl's (1998) issue of "heroic vs. shared leadership," which he articulated as a major issue to be resolved in leadership research. Pearce and colleagues (e.g., Pearce, 1997; Pearce & Conger, in press; Pearce et al., 2001; Pearce & Sims, 2000) have also highlighted this as an important issue for teams and leadership research. Overall, the results show that shared leadership is a more useful predictor (Farh et al., 1990) of team effectiveness; that is, it explains more variance than vertical ("heroic") leadership. Nevertheless, the

beta weights for the regression models, which are reported in Table 3, show that several of the vertical leadership behaviors are useful predictors of team effectiveness. Therefore, these two types of leadership should not necessarily be considered as mutually exclusive. That is, both vertical and shared leadership seem likely to affect team effectiveness.

We found several significant effects of the more specific types of leadership. For example, vertical aversive leadership and shared aversive leadership were found to be negatively related to team self-ratings of team effectiveness. Additionally, vertical directive leadership was found to be negatively related to manager ratings of team effectiveness, whereas shared directive leadership was found to be negatively related to manager and internal customer ratings of team effectiveness. In contrast, vertical transformational leadership was found to be positively related to manager and team self-ratings of team effectiveness, and shared transformational leadership was found to be positively related to all three ratings of team effectiveness. Finally, shared empowering leadership was found to be positively related team self-ratings of team effectiveness. Overall, these results extend recent research in the factors that affect the effectiveness of empowered teams (e.g., Kirkman & Rosen, 1999) by identifying leadership, in its many forms, as a potentially important antecedent of the effectiveness of empowered teams.

Practical Implications

There are several important practical implications from this research, especially in regard to training and team design considerations. First, shared leadership, which heretofore has been a relatively neglected area of research, seems to be an important ingredient in teams that are responsible for complex tasks. Not only does shared leadership tend to do a very good job of explaining team effectiveness, but it also seems to be a relatively more useful predictor of team effectiveness than the more traditional vertical leadership. Thus, shared leadership seems a good candidate for incorporation into leadership and teamwork training programs.

Second, the five overall leadership types identified in this research—aversive, directive, transactional, transformational, and empowering—do not all seem to be equally useful when it comes to explaining team effectiveness. Consistent with Ashforth's (1994) predictions, the direction of significant relationships of aversive and directive leadership was *negative*. On the other hand, and consistent with the predictions of Bass, Avolio, and colleagues (e.g., Bass & Avolio, 1993), the direction of significant relationships of transformational and empowering leadership was *positive*. Thus, it appears that for empowered teams with complex tasks, gains could be realized from increased emphasis on transformational and empowering leadership, whereas aversive and directive leadership should be deemphasized. Of course, these specific recommendations are highly consistent with the overarching philosophy and intent of empowered teams (e.g., Mohrman et al., 1995, Yeatts & Hyten, 1998).

Third, examination of the correlation table seems to indicate that there is a close relationship between vertical leadership and shared leadership. For example, of the 25 possible correlations between vertical and shared leadership, 20 were significant at $p < .05$. One potential concern with these high correlations is that respondents were not able to distinguish between vertical and shared leadership. However, if respondents were not able to make any distinction between vertical and shared leadership, we would expect them to be equally effective predictors of team effectiveness. Thus, examination of the usefulness analyses suggests that respondents were able to make a distinction between the two sources of leadership. We review the leadership profiles of high- and low-performing teams later; these results also suggest that respondents were able to make a distinction between the two sources of leadership.

An alternate interpretation of these correlations is that while they are not causal, they suggest that the best predictor of shared aversive behavior is vertical aversive behavior; of shared directive behavior is vertical directive behavior; of shared transactional behavior is vertical transactional behavior; of shared transformational behavior is vertical transformational behavior; and of shared empowering behavior is vertical empowering behavior. This could be the result of role-modeling influences (see Bandura, 1986; Rich, 1997). For example, social cognitive theory (Bandura, 1986) advances the concept that people, their behavior, and their

environment all influence each other and thus develop a learning effect that may translate into a mimetic function within teams in which behavioral consistency becomes the norm. This result also seems congruent with the attraction-selection-attrition framework (Schneider, 1987). This framework also suggests that one will observe behavioral consistency within groups. Nonetheless, how this mimetic function occurs, or does not occur, would benefit from further investigation.

Thus, it appears that the best predictor of a specific type of shared leadership is its vertical leadership counterpart. Therefore, if we assume causation, the best way for a vertical leader to reduce the amount of aversive or directive behavior among members of the group is to reduce the amount of aversive or directive behavior in which he or she engages, respectively. Conversely, the best way for the vertical leader to instill greater amounts of transformational and empowering behavior throughout the group is to engage in more transformational and empowering behavior, respectively. In the end, it seems important that both formal leaders and informal leaders—that is, team members—be given training in leadership skills.

As a follow-up analysis, we wanted to see if there were fundamental differences in the "profiles" of leadership exhibited by low-performing versus high-performing teams. Thus, we selected the three teams that were rated most lowly by all three rating sources to represent low-performing teams and three teams that were rated most highly by all three rating sources to represent high- performing teams. We then computed the average scores the low- and high-performing teams received on the 10 leadership dimensions. We graphically present this data in Figure 1. Two interesting differences between the low- and high-performing teams emerged from this analysis. First, high-performing teams seem to exhibit "more" leadership than low-performing teams. Of the 10 measures of leadership, 9 are higher in high-performing teams. Second, the relative mix of vertical versus shared leadership is different. High-performing teams seem to exhibit at least as much, and perhaps even slightly more, shared leadership as vertical leadership; whereas low-performing teams seem to exhibit more vertical leadership than shared leadership.

Future Research

Several avenues for future research are readily identifiable. First, the identification of shared leadership is an important step in a new direction for leadership theory and research. However, the measurement of shared leadership is something that would benefit from additional study. For instance, this research used a dual response format to elicit descriptions of shared leadership. Clearly, alternative response formats could, and should, be investigated. For example, one might investigate the specific leader behavior of all team members. Another perplexing issue for the measurement of shared leadership is whether to include the designated leader—that is, the vertical leader—in the measurement. In this research, the respondents were asked to rate shared leadership, excluding the role of the formal team leader. While this does seem appropriate, in teams that push the frontiers of self-managing work team concepts, it is conceivable that the formal team leader may exist only in name and leadership responsibilities may truly be shared entirely among all team members. In this situation, it may be best to measure the leader behavior of all team members simultaneously. Alternatively, one might examine the leadership behavior of each of the individuals in the team separately.

Second, while this research examined a broad array of team effectiveness measures, they did not seem to be identifiable as fine grained measures, but rather tended to all group together. Although this is not of particular concern in this research, there are research settings in which more fine grained measures are appropriate. Thus, while the measures of effectiveness performed quite well in this research, future research might address the development of alternate measurement protocols that provide more distinction between the various components of effectiveness.

We also suggest inquiring into the issue of how other conditions might influence the relationship between shared leadership and team effectiveness. Building on the findings of Littlepage, Robison, and Reddington (1997), we might speculate, for example, that shared leadership is likely to be more potent in mature teams in which leadership skills of team members have had an opportunity to develop and flower and the members understand and are

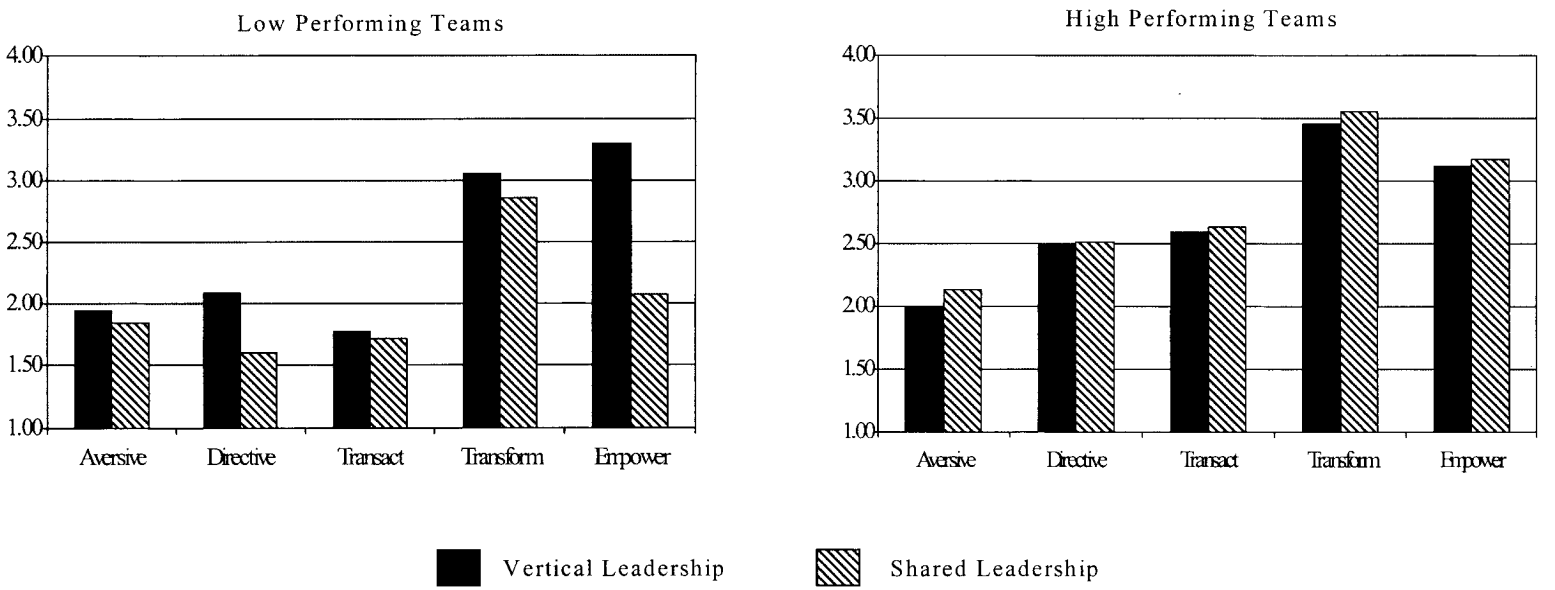

Figure 1. Leadership profiles of low- and high-performing teams.

better able to take advantage of each other's skills. Thus, situational and contextual factors seem likely to affect the importance of shared leadership in the explanation of team effectiveness (Pearce & Sims, 2000). On the other hand, it also seems likely that certain situational and contextual factors might affect the likelihood of the *display* of shared leadership (e.g., team member skills, team member familiarity, team member proximity, and team maturity). Thus, research is needed to explore the questions of the factors that affect both the display and the importance of shared leadership.

Although we found vertical and shared leadership to be positively associated, the causal relationship between the two would benefit from further investigation. This will require longitudinal research. Two competing frameworks are offered here to guide future research on this topic. On the one hand, social cognitive theory, with role modeling effects, would suggest that the team members would emulate the leader. On the other hand, the interpersonal power literature would suggest that the team may "take over" leadership functions not being performed by the team leader. Both scenarios seem plausible. The reverse causal relationships might also exist; that is, shared leadership may influence the display of vertical leadership. Clearly this is an area for future research.

Of note, all three rating sources for team effectiveness were positively and significantly correlated, thus allaying the fears of some researchers who strongly advocate against using self-ratings of effectiveness because of the potential of in-group bias. The results here indicate that team self-ratings may indeed be a quite valid source of ratings data. For example, in this research, the self-ratings seem to be more responsive to empowering leadership. Overall, the relationship between leadership and effectiveness was strongest with team self-ratings, thus suggesting that the fears of some researchers regarding the use of self-ratings are not groundless, but perhaps a bit overstated. Nonetheless, this would prove a fruitful area for future research.

Finally, while this research identified an important role for an alternate social source of leadership (shared leadership), it will be interesting to see if, and how, shared leadership affects other important team outcome variables and if the concept can be replicated in alternate organizational contexts. A very interesting question will be if shared leadership can serve as a "substitute" for more formal vertical leadership. The juxtaposition of vertical and shared leadership generates several interesting theoretical propositions.

Limitations

This research, as any, is not without limitations. First, the sample focused on one type of team (empowered CMTs). These teams were relatively autonomous and worked on highly complex tasks. Thus, the results may not generalize to other types of teams or groups.

Second, the sample was drawn from one organization. This approach does control for the influence of contextual issues (e.g., organizational culture), but it also raises the possibility that the results may not generalize to alternate organizational contexts (e.g., organizations that are not in transition).

Third, the sample size was adequate, but additional data would facilitate the specification of more complex causal models. Thus, future research would do well to collect larger data sets.

Finally, the selection of leader behaviors for this research was extensive, but it was not exhaustive. Thus, it is clearly possible that investigations of different leader behaviors may produce different results.

Conclusion

Teams have become an increasingly important component in organizations (e.g., Aldag & Fuller, 1993; Dumaine, 1994; Forsyth, 1999; Pearce & Conger, in press; Pearce et al., 2001). With this increasing emphasis on teams, there has been an increasing need to better understand team leadership and team effectiveness (Hollenbeck, Ilgen, & Sego, 1994; Pearce & Sims, 2000). Therefore, this research proposed and examined a nontraditional social source of team leadership and examined its relationship with CMT effectiveness.

This research has several significant contributions to the field of team leadership research. First, this study utilized a design that collected antecedent variables approximately 6 months before the collection of outcome variables, thereby enhancing the causal nature of the research. Second, this study examined a relatively

unique form of teams (CMTs), thus providing some insight into teams that deal with complex issues from problem identification to solution implementation. Third, the range of leader behaviors examined was extensive. Fourth, this study examined an alternate social source of leadership, shared leadership, and found this alternate source of leadership to be quite useful in explaining the effectiveness of teams. Fifth, this study developed an extensive protocol for the measurement of team effectiveness. Seven dimensions of effectiveness were measured with ratings from three sources: (a) managerial ratings, (b) internal customer ratings, and (c) team self-ratings.

Most of all, this research has placed the spotlight on shared leadership as a potentially important ingredient in explaining team effectiveness. Clearly, shared leadership deserves more theoretical and empirical attention.

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Appendix A

Questionnaire Items

Leader Behavior Items

Aversive Leadership

Intimidation

My team leader (members) tries (try) to influence me through threat and intimidation.
I feel intimidated by my team leader's (members') behavior.
My team leader (members) can be quite intimidating.

Reprimand

My team leader (members) lets (let) me know about it when I perform poorly.
My team leader (members) reprimands (reprimand) me when my performance is not up to par.
When my work is not up to par, my team leader (members) points (point) it out to me.

Directive Leadership

Assigned goals

My team leader (members) establishes (establish) my performance goals.
My team leader (members) sets (set) the goals for my performance.
My team leader (members) establishes (establish) the goals for my work.

Instruction and command

When it comes to my work, my team leader (members) gives (give) me instructions on how to carry it out.
My team leader (members) gives (give) me instructions about how to do my work.
My team leader (members) provides (provide) commands in regard to my work.

Transactional Leadership

Material reward

My team leader (members) will recommend that I am compensated well if I perform well.
My team leader (members) will recommend that I am compensated more if I perform well.
If I perform well, my team leader (members) will recommend more compensation.

(*Appendixes continue*)

Personal reward

My team leader (members) gives (give) me positive feedback when I perform well.
My team leader (members) commends (commend) me when I do a better-than-average job.
My team leader (members) gives (give) me special recognition when my work performance is especially good.

Management by exception (active)

My team leader (members) focuses (focus) attention on irregulars, mistakes, exceptions, and deviations from standard.
My team leader (members) closely monitors (monitor) my performance for errors.
My team leader (members) spends (spend) time "putting out fires."
My team leader (members) tracks (track) mistakes.
My team leader (members) directs (direct) attention toward failure to meet standards.

Management by exception (passive)

My team leader (members) allows (allow) performance to fall below minimum standards before trying to make improvements.
My team leader (members) delays (delay) taking action until problems become serious.
My team leader (members) tells (tell) me what I've done wrong rather than what I've done right.
My team leader (members) waits (wait) until things have gone wrong before taking action.
My team leader (members) shows (show) firm belief in "if it ain't broke don't fix it."

Transformational Leadership

Performance expectations

My team leader (members) expects (expect) me to perform at my highest level.
My team leader (members) encourages (encourage) me to go above and beyond what is normally expected of one (e.g., extra effort).
My team leader (members) expects (expect) me to give 100% all of the time.

Challenge to status quo

My team leader (members) isn't (aren't) afraid to "buck the system" if he/she (they) thinks (think) it is necessary.
My team leader (members) is (are) non-traditional type(s) that "shakes up the system" when necessary.
My team leader (members) isn't (aren't) afraid to "break the mold" to find different ways of doing things.

Vision

My team leader (members) provides (provide) a clear vision of who and what our team is.
My team leader (members) provides (provide) a clear vision of where our team is going.
Because of my team leader (members), I have a clear vision of our team's purpose.

Idealism

My team leader (members) is (are) driven by higher purposes or ideals.
My team leader (members) has (have) a strong personal dedication to higher purposes or ideals.
My team leader (members) strives (strive) towards higher purposes or ideals.

Inspirational communication

My team leader (members) shows (show) enthusiasm for my efforts.
My team leader (members) approaches (approach) a new project or task in an enthusiastic way.
My team leader (members) stresses (stress) the importance of our team to the larger organization.

Intellectual stimulation

My team leader (members) emphasizes (emphasize) the value of questioning team members.
My team leader (members) encourages (encourage) me to rethink ideas which had never been questioned before.
My team leader (members) questions (question) the traditional way of doing things.
My team leader (members) seeks (seek) a broad range of perspectives when solving problems.
My team leader (members) looks (look) at problems from many different angles.

Empowering Leadership

Encourage self-reward

My team leader (members) encourages (encourage) me to treat myself to something I enjoy when I do a task especially well.
My team leader (members) urges (urge) me to reward myself with something I like when I have successfully completed a major task.
My team leader (members) encourages (encourage) me to give myself a pat on the back when I meet a new challenge.

Encourage teamwork

My team leader (members) encourages (encourage) me to work together with other individuals who are part of the team.
My team leader (members) urges (urge) me to work as a team with other individuals who are part of the team.
My team leader (members) advises (advise) me to coordinate my efforts with other individuals who are part of the team.

Participative goal setting

My team leader (members) and I work together to decide what my performance goals should be.
My team leader (members) and I sit down together and reach agreement on my performance goals.
My team leader (members) works (work) with me to develop my performance goals.

Encourage independent action

My team leader (members) encourages (encourage) me to search for solutions to my problems without supervision.
My team leader (members) encourages (encourage) me to find solutions to my problems without his/her (their) direct input.
My team leader (members) advises (advise) me to solve problems when they pop up without always getting a stamp of approval.
My team leader (members) urges (urge) me to assume responsibilities on my own.

Encourage opportunity thinking

My team leader (members) advises (advise) me to look for the opportunities contained in the problems I face.
My team leader (members) encourages (encourage) me to view unsuccessful performance as a chance to learn.
My team leader (members) urges (urge) me to think of problems as opportunities rather than obstacles.

Encourage self-development

My team leader (members) encourages (encourage) me to develop myself.
My team leader (members) encourages (encourage) me to develop my skills and abilities.
My team leader (members) encourages (encourage) me to seek out opportunities to learn.
My team leader (members) encourages (encourage) me to seek out educational opportunities.

(*Appendixes continue*)

My team leader (members) encourages (encourage) me to learn by extending myself.
My team leader (members) encourages (encourage) me to learn new things.

Team Effectiveness Items

Output Effectiveness

The team delivers its commitments.
The team delivers its commitments on time.
The team provides a volume of work consistent with established standards.
The team is highly effective at implementing solutions.
The team delivers important changes.

Quality Effectiveness

The quality of the team's output is very high.
The team performs duties accurately and consistently.
The team eliminates root problems, not just symptoms.

Change Effectiveness

The team faces new problems effectively.
The team changes behavior to meet the demands of the situation.
The team copes with change very well.

Organizing and Planning Effectiveness

The team sets goals and priorities for maximum efficiency.
The team develops workable plans.
The team works on important problems.
The team has its priorities straight.

Interpersonal Effectiveness

The team communicates its progress.
The team proactively communicates its progress.
The team keeps everyone informed.
The team keeps everyone informed on its progress.

Value Effectiveness

The team's contribution to the company is very valuable.
The team makes valuable contributions to the company.
The contributions of this team are very valuable to the company.

Overall Effectiveness

The team is highly effective.
The team is making very good progress on the team's charter.
The team does very good work.
The team does a very good job.

Appendix B

Means, Standard Deviations, and Intercorrelations Among the Study Variables

Variable	*M*	*SD*	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Team size	7.24	2.73	—													
2. Vertical aversive	2.50	0.60	−.03	—												
3. Vertical directive	2.60	0.55	−.11	.67**	—											
4. Vertical transactional	2.42	0.58	−.03	.40**	.54**	—										
5. Vertical transformational	3.58	0.40	.05	.24*	.41**	.20†	—									
6. Vertical empowering	3.43	0.40	.14	.28*	.31**	.24*	.49**	—								
7. Shared aversive	2.46	0.50	−.02	.82**	.46**	.32**	.21†	.32**	—							
8. Shared directive	2.52	0.50	−.06	.51**	.79**	.36**	.34**	.31**	.42**	—						
9. Shared transactional	2.42	0.54	−.01	.32**	.47**	.90**	.21†	.24*	.30**	.43**	—					
10. Shared transformational	3.53	0.38	.13	.06	.25*	.14	.78**	.44**	.08	.42**	.24*	—				
11. Shared empowering	3.31	0.43	.15	.19	.31**	.28*	.47**	.79**	.26*	.49**	.37**	.67**	—			
12. Manager ratings of team effectiveness	3.32	0.62	−.02	.09	−.05	.23	.25†	.12	.23	−.00	.14	.37*	.25†	—		
13. Customer ratings of team effectiveness	3.22	0.75	−.37**	.05	−.06	.17	.05	.01	.10	−.06	.14	.17	.17	.45**	—	
14. Team self-ratings of team effectiveness	3.34	0.46	−.14	−.32*	−.03	.02	.45**	.18	−.32*	.15	.05	.54**	.37*	.38*	.52**	—

† $p < .10$. * $p < .05$. ** $p < .01$.

(*Appendixes continue*)

Appendix C

Vertical and Shared Leader Behavior Factor Loadings

Factor name/items[a]	Factor loading									
	1	(I)	2	(II)	3	(III)	4	(V)	5	(IV)
1 (I): Transformational Behavior										
My team leader provides a clear vision of where our team is going.	**.76**	**.71**	.21	.21	.08	.06	−.00	−.00	.10	.12
My team leader isn't afraid to "break the mold" to find different ways of doing things.	**.72**	**.57**	.03	.17	.17	.12	.17	.05	.22	.25
My team leader isn't afraid to "buck the system" if he or she thinks it is necessary.	**.71**	**.55**	.10	.10	.20	.13	.16	.12	.08	.12
Because of my team leader, I have a clear vision of our team's purpose.	**.71**	**.67**	.27	.18	.17	.05	−.08	.04	.04	.12
My team leader allows performance to fall below minimum standards before trying to make improvements.	**−.70**	**−.64**	−.08	.03	.06	.07	.08	.10	−.03	.23
My team leader delays taking action until problems become serious.	**−.69**	**−.62**	−.10	−.13	.08	−.04	.26	.16	.04	.12
My team leader approaches a new project or task in an enthusiastic way.	**.68**	**.62**	.06	.15	.08	.08	.00	−.13	.25	.29
My team leader provides a clear vision of who and what our team is.	**.66**	**.61**	.05	.01	.04	−.01	.03	.03	.18	.11
My team leader has a strong personal dedication to higher purposes or ideals.	**.66**	**.61**	.26	.18	.04	.09	.11	.03	.17	.34
My team leader waits until things have gone wrong before taking action.	**−.62**	**−.62**	.10	.07	.06	.02	.31	.31	.01	.11
My team leader is a nontraditional type who "shakes up the system" when necessary.	**.60**	**.43**	.02	.06	.24	.10	.30	.18	.10	.28
My team leader strives toward higher purposes or ideals.	**.56**	**.57**	.25	.13	.05	.05	.10	.09	.28	.34
My team leader stresses the importance of our team to the larger organization.	**.55**	**.59**	.28	.18	.09	.03	−.13	−.07	.23	.07
My team leader expects me to perform at my highest level.	**.52**	**.55**	.12	.03	.07	.02	.21	.16	.12	.16
My team leader is driven by higher purposes or ideals.	**.48**	**.47**	.23	.10	.08	.12	.05	−.02	.06	.30
My team leader encourages me to go above and beyond what is normally expected of one (e.g., extra effort).	**.46**	**.40**	.17	.11	.22	.20	.13	.16	.22	.27
2 (II): Directive Behavior										
My team leader works with me to develop my performance goals.	.22	.31	**.70**	**.67**	.11	.07	.10	.13	.21	.03
My team leader establishes the goals for my work.	.17	.23	**.66**	**.62**	.19	.18	.10	.05	.12	.10
My team leader and I work together to decide what my performance goals should be.	.16	.16	**.65**	**.70**	.22	.13	.15	.02	.15	.04
When it comes to my work, my team leader gives me instructions on how to carry it out.	.22	.06	**.63**	**.57**	−.06	.09	.13	.13	.05	.16
My team leader gives me instructions about how to do my work.	.14	.01	**.63**	**.60**	.11	.13	.07	.08	−.02	.11
My team leader sets the goals for my performance.	.14	.18	**.60**	**.71**	.30	.10	.23	.03	.10	.10
My team leader and I sit down together and reach agreement on my performance goals.	.20	.21	**.60**	**.66**	.34	.18	.16	.11	.14	.00
My team leader establishes my performance goals.	.12	.09	**.58**	**.62**	.34	.18	.20	.15	.01	.08
My team leader provides commands in regard to my work.	.01	−.15	**.56**	**.53**	.09	.10	.35	.28	−.08	.01
3 (III): Transactional Behavior										
If I perform well, my team leader will recommend more compensation.	.08	.07	.16	.17	**.84**	**.81**	.11	.10	.01	.01
My team leader will recommend that I am compensated more if I perform well.	.09	.05	.20	.23	**.81**	**.77**	.15	.07	.06	.04
My team leader urges me to reward myself with something I like when I have successfully completed a major task.	.02	−.03	.18	.17	**.76**	**.77**	.05	.12	.05	.07
My team leader will recommend that I am compensated well if I perform well.	.15	.08	.16	.15	**.74**	**.73**	.18	.14	.03	.03

My team leader encourages me to treat myself to something I enjoy when I do a task especially well.	.08	.02	.03	.09	.74	.80	.04	.02	.04	.12
My team leader gives me special recognition when my work performance is especially good.	.16	.22	.27	.31	.53	.54	−.02	.02	.31	.24
My team leader encourages me to give myself a pat on the back when I meet a new challenge.	.24	.35	.34	.32	.47	.42	−.03	.05	.26	.22
4 (V): Aversive Behavior										
My team leader can be quite intimidating.	−.02	−.17	.11	.10	.13	.07	**.77**	**.70**	−.13	−.18
I feel intimidated by my team leader's behavior.	−.20	−.32	.08	.14	.17	.08	**.65**	**.57**	−.16	−.12
My team leader focuses attention on irregulars, mistakes, exceptions, and deviations from standard.	.13	.16	.16	.03	−.09	.03	**.62**	**.45**	.12	.27
My team leader reprimands me when my performance is not up to par.	−.03	−.04	.14	.09	.36	.30	**.60**	**.62**	.10	.11
When my work is not up to par, my team leader points it out to me.	.11	.16	.35	.25	.14	.16	**.59**	**.68**	.29	.10
My team leader tracks mistakes.	.03	.08	.40	.28	−.09	−.08	**.57**	**.56**	.06	−.15
My team leader lets me know about it when I perform poorly.	.27	.21	.22	.05	.19	.38	**.50**	**.38**	.24	.18
5 (IV): Empowering Behavior										
My team leader encourages me to find solutions to my problems without his or her direct input.	.06	.08	.13	.11	−.10	−.01	.02	−.02	**.73**	**.68**
My team leader encourages me to search for solutions without supervision.	.17	.16	.10	.20	.02	−.01	−.07	−.13	**.71**	**.63**
My team leader urges me to assume responsibilities on my own.	.27	.31	.05	.05	.05	.07	.07	.02	**.67**	**.58**
My team leader advises me to solve problems when they pop up without always getting a stamp of approval.	.15	.10	−.09	−.04	.24	.31	.08	.04	**.64**	**.63**
My team leader encourages me to view unsuccessful performance as a chance to learn.	.30	.34	.19	.22	.20	.23	.07	.17	**.56**	**.40**
My team leader encourages me to learn by extending myself.	.39	.31	.24	.29	.31	.20	.11	.13	**.46**	**.39**
Eigenvalues	12.17	10.38	4.92	4.71	2.66	2.51	2.12	1.74	1.83	1.93
Variance (%)	27.0	23.1	10.9	10.5	5.9	5.6	4.7	3.9	4.1	4.3
Cronbach's α	.81	.72	.87	.85	.87	.87	.77	.75	.80	.75
$r_{WG(J)}$	.87	.88	.89	.86	.86	.84	.90	.91	.94	.91

Note. Factors are presented in the order of extraction from the analysis of vertical leadership; the Roman numerals in parentheses indicate the order of extraction from the analysis of shared leadership. Boldface numbers indicate item primary factor loadings.

[a] Items appear as worded for description of the vertical leader.