

## What type of leadership behaviors are functional in teams? A meta-analysis

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### Abstract

Despite the increased work on leadership in teams, there is a lack of integration concerning the relationship between leader behaviors and team performance outcomes. A framework depicting the relationship between leadership functions, specific leadership behaviors, and conditions which enable team performance was created. Using this framework, a meta-analysis was conducted to examine the relationship between leadership behavior in teams and behaviorally-based team performance outcomes. Results suggest the use of task-focused behaviors is moderately related to perceived team effectiveness and team productivity (.333, .203). Person-focused behaviors were related to perceived team effectiveness (.360), team productivity (.284), and team learning (.560). Sub-group analyses indicated that the specific leadership behaviors investigated were generally related to team performance outcomes. Most notably, empowerment behaviors accounted for nearly 30% of the variance in team learning. Finally, moderator analyses investigating the level of task interdependence were conducted. Study limitations, practical implications, and directions for research are also outlined.

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Within the last twenty-five years there has been an explosion of theoretical and empirical work conducted on team effectiveness. Partially driven by the rise of teams within organizations, this work has sought to better understand the antecedents, processes, and emergent states which facilitate effective team outcomes. An emerging area within this work is the role that leaders occupy in facilitating effective, adaptive teams. Specifically, while it has long been argued that leaders play a key role in enabling individual and organizational performance (Bass, 1990; Follett, 1926), work has recently expanded to examine the role that team leaders occupy in promoting, developing, and maintaining team effectiveness (e.g., Hackman & Wageman, 2005; Kozlowski, Gully, Salas, et al., 1996; Serfaty, Entin, & Deckert, 1994; Zaccaro, Rittman, & Marks, 2001).

Despite the growing body of work, there has been a lack of integration concerning the relationship between specific leader behaviors and team performance outcomes. Meta-analyses have examined the relationship between team

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leadership behavior and affective outcomes (Foels, Driskell, Mullen, & Salas, 2000; Mullen, Symons, Hu, & Salas, 1989), but few have sought to integrate the work on leadership behaviors and behavioral or cognitive team performance outcomes. The current endeavor was undertaken in part to expand this knowledge base by using meta-analysis to investigate the relationship between team leader behaviors and behaviorally-based team performance outcomes (i.e., perceived team effectiveness, team productivity, and team learning).

## 1. Team leadership

Many of the researchers who are investigating leadership in teams do so from a functional approach where “[the leader’s] main job is to do, or get done, whatever is not being adequately handled for group needs” (McGrath, 1962, as cited in Hackman & Walton, 1986, p. 5). Within this approach the leader is effective to the degree that he/she ensures that all functions critical to task and team maintenance are completed. While it is not necessary that the leadership functions be accomplished by a single person (i.e., it may be distributed throughout the team), the leader is responsible for ensuring that these functions are accomplished. Under this approach, team leadership can be described as a dynamic process of social problem solving accomplished through generic responses to social problems. These generic responses are captured in four broad categories: (1) information search and structuring, (2) information use in problem solving, (3) managing personnel resources, and (4) managing material resources (Fleishman et al., 1991, see Table 1).

Taking a slightly different approach is the work by Hackman and colleagues. This body of work does not focus on leadership functions, but on identifying conditions that leaders can create to facilitate team effectiveness. Hackman (2002) argued for the following conditions: teams must be real, have compelling direction, an enabling structure (core conditions), a supportive organizational context, and expert coaching (enabling conditions). A real team is one in which there is a team task, clear boundaries, specified authority to manage work processes, and some degree of membership stability (Hackman, 2002). Compelling direction, the second condition, refers to direction which is seen as challenging, clear, and consequential (Hackman, 2002). The grounding of this direction is gained from the enactment of the first two leadership functions identified by Fleishman et al. (1991), information search and structure and information use in problem solving. Information collected within the search process serves to inform the leader as to the current situation and situational contingencies. This information is then used to decide upon a course of action during the cognitive processes reflected within ‘information use in problem solving’. Once a course of action and/or strategy is decided upon, direction flows from this content and should provide members with a sense of what is expected and why it is important in relation to the team’s common goal. Direction given according to the above guidance should serve to motivate team members, align strategy, and promote the full use of the team’s capabilities (i.e., effective management of personnel and material resources).

Leaders also manage personnel resources by creating the third condition for team effectiveness, an enabling structure. An enabling structure is created through the manner in which work is designed, the promotion of core norms of conduct, and team composition is organized (Hackman, 2002). For example, norms that encourage team members to capitalize on the diversity of resources that often exist within teams can assist in creating an enabling structure. Norms that promote real time adjustment of strategy, environmental scanning, and team self-correction can also promote an enabling structure. In addition, designing work such that members identify with the task and see it as meaningful, experience a sense of autonomy, and are able to obtain some degree of feedback from the work itself, serves to provide a structure that enables team effectiveness by increasing member motivation (Hackman & Oldham, 1980). Finally, the

Table 1  
Leadership functions (adapted from Fleishman et al., 1991)

Leadership functions	Definition
Information search and structure	“Systematic search, acquisition, evaluation, and organization of information regarding team goals and operations” (Zaccaro et al., 2001, p. 455).
Information use in problem solving	Using information gained from boundary spanning activities towards solving the problem at hand.
Managing personnel resources	Obtaining, allocating, developing, and motivating personnel resources as well as utilizing these resources to enact the developed plan and monitor progress.
Managing material resources	Obtaining and allocating material resources as well as utilizing these resources to enact the developed plan and monitor progress.

manner in which the team is composed in terms of size, diversity of knowledge, skills, and perspectives, can serve to provide an enabling structure. Conversely, when done incorrectly, the assignment of personnel to teams may detract from an enabling structure being created.

The final two ways that leaders may enable conditions for effective teams (i.e., a supportive organizational context, provision of expert coaching) can also be shown to relate to the leadership functions identified by Fleishman et al. (1991). Falling primarily within the leadership function of management of material resources, leaders can provide a supportive organizational context through the design of reward systems, information systems, and training opportunities (i.e., educational system, Hackman, 2002). Finally, the provision of expert coaching falls within the leadership function of management of personnel resources; specifically, the development and motivation of team members. The coaching behavior of leaders has recently begun to receive much attention with regards to team performance. Kozlowski, Gully, McHugh et al. (1996) and Kozlowski, Gully, Salas et al. (1996) argue that across the course of team development leaders go through a progression of developmental roles — mentor, instructor, coach, and facilitator. Similarly, Hackman & Wageman (2005) argue that team leaders can intervene with one of three types of coaching (motivational, consultative, educational) dependent on the team’s developmental stage.

Through integrating the leadership functions identified by Fleishman et al. (1991) with the conditions for team effectiveness proposed by Hackman (2002) a preliminary picture of how leadership can impact team performance is illuminated (see Fig. 1). Leaders search the environment for pertinent cues and integrate this information into their existing cognitive structures which are then used to guide problem solving. This culminates in a course of action. In order to promote compatible knowledge structures, which serve to guide team member behavior (Marks, Zaccaro, & Mathieu, 2000), leaders provide compelling direction to the team concerning the chosen course of action/mission. This direction provides the basis for the management of personnel resources (Ginnett, 1993). In order to effectively manage personnel resources not only is compelling direction needed, but the leader must also ensure that an enabling team structure has been created (i.e., one that facilitates task accomplishment through appropriate norms, size, and capability requirements) and expert coaching is available to continually develop team members and assist in regulatory activities. Finally, in order to effectively complete the final leadership function, management of material resources, the leader needs to ensure a supportive organizational context exists so that access to resources is provided.

While not explicitly illustrated (as this was not our primary focus), the entire framework in Fig. 1 rests on the underlying tenet that the team has the KSAs which enable the leadership functions to be enacted. Given that these requisite KSAs are present, the conditions of team effectiveness instituted by the leader serve to shape the proximal

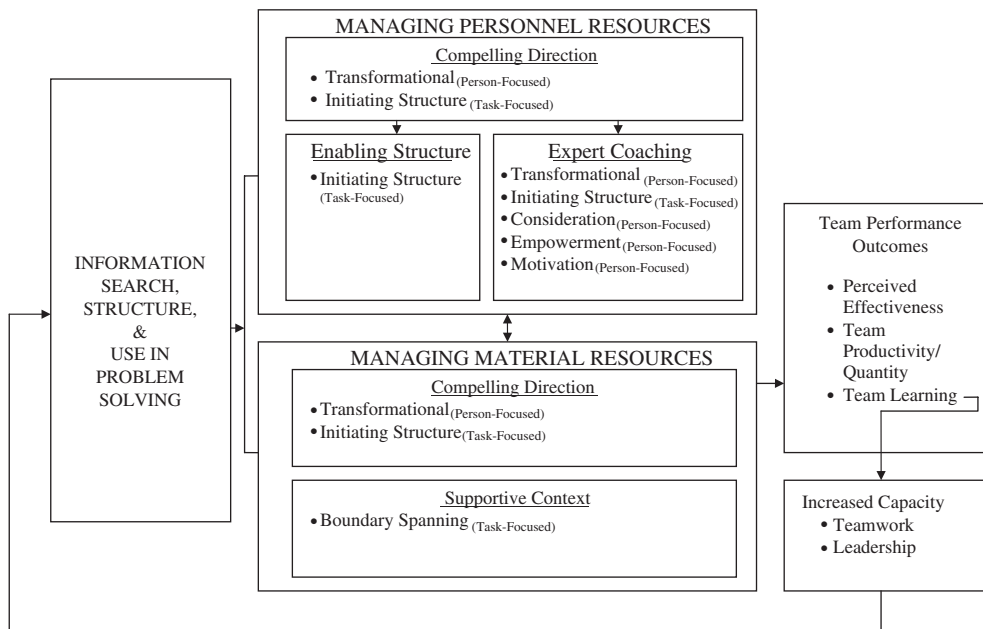


Fig. 1. Team leadership framework.

outcomes (e.g. productivity, effectiveness, team learning) resulting from team performance. Team learning then serves to increase the teamwork and leadership capacity present (Day, Gronn, & Salas, 2004) within the team. This capacity then filters back into the enactment of leadership functions in the next performance cycle. Furthermore, while Fig. 1 reflects the majority of the work that has been done on leadership in teams by being characterized by an IPO approach, it acknowledges the dynamic nature of team performance through a series of feedback loops and double-sided arrows. We note that it is not as dynamic as some more recent frameworks (i.e., Day et al., 2004) on team leadership as these frameworks have not yet engendered empirical studies sufficient to be incorporated into the current meta-analysis. However, the framework begins to provide an idea of how the leadership functions relate to the conditions for team effectiveness. Yet a question remains about the behaviors that enable the leadership functions which lead to the creation of the conditions for team effectiveness. Identification of these behaviors is important for this information serves to inform practitioners as to what knowledge and skills need to be trained.

## 2. Leadership behavior in teams

Leadership research from the behavioral perspective has flourished. In fact, one review identified 65 classification systems of leader behavior proposed between 1940 and 1986 (Fleishman et al., 1991). Fleishman and colleagues noted that a common theme within nearly every identified classification system was a trend for behaviors to be broken into one of two categories: those dealing with task accomplishment [i.e., task-focused] and behaviors which facilitate team interaction and/or development [i.e., person-focused]. This dichotomy has not only appeared in the literature on individual leadership (i.e., initiating structure-consideration, directive-participative, task-orientated-socio-emotional), but has appeared in the literature on teams and leadership in teams. Building from the work of Salas, Dickinson, Converse, & Tannenbaum (1992), task-focused behaviors are those that facilitate understanding task requirements, operating procedures, and acquiring task information. Conversely, person-focused behaviors are those that facilitate the behavioral interactions, cognitive structures, and attitudes that must be developed before members can work effectively as a team. This dichotomy serves as a high level organizing framework for the leadership behaviors examined here.

When the accumulated studies permit such analyses, the relationships between specific leader behaviors and specific team performance outcomes will be estimated. The focus is limited to a small sample of behaviors which have been empirically examined within team settings and can be tied back to the framework presented in Fig. 1. The set of leader behaviors which are the focus of the current study include: transformational, transactional, initiating structure, consideration, and boundary spanning as well as behaviors that serve to motivate and empower (see Fig. 1).

### 2.1. Task-focused leadership

Given the sample of leadership behaviors that have been empirically examined within teams, three categories of behaviors are subsumed under task-focused leadership: transactional, initiating structure, and boundary spanning. Each of these is discussed in turn with an emphasis on how they fit into the framework.

#### 2.1.1. Transactional

Transactional leadership behaviors are built on dyadic exchanges whereby the leader provides praise, rewards, or withholds punishment from a subordinate who complies with role expectations. This type of leadership reflects behaviors in which there is a focus on reward contingencies and exchange relationships (Burns, 1978). As the basis of transactional leadership behaviors has been argued to fall within expectancy theory, path-goal theory, equity theory, and reinforcement theory (Pearce et al., 2003) they primarily reflect a focus on task accomplishment.

Transactional leadership is comprised of three dimensions, contingent reward, active management by exception, and passive management by exception. Research suggests that transactional leadership behavior based on contingent rewards positively affects subordinate satisfaction and performance (Hunt & Schuler, 1976; Klimoski & Hayes, 1980; Podsakoff & Schriesheim, 1985). Results of prior meta-analyses suggest the estimated true score correlation between contingent reward behaviors and group/organization performance is small, but positive ( $r=.16$ ) (Judge & Piccolo, 2004). However, prior research has also documented a negative impact of contingent rewards on subordinate satisfaction and performance (Yammarino & Bass, 1990).

Transactional leadership behaviors are likely to be used by team leaders in completing the functional requirement of managing personnel resources. Transactional behaviors are one mechanism that leaders may use during the provision

of expert coaching. Team leaders may coach and develop team members through feedback which incorporates the contingent rewards characteristic of transactional behavior. In keeping with the limited findings regarding transactional leadership behaviors and teams, it is expected that transactional behaviors will have a small, but significant relationship with team performance outcomes.

### 2.1.2. *Initiating structure*

Initiating structure is a label given to leader behaviors which emphasize the accomplishment of task objectives via the minimization of role ambiguity and conflict. It has been argued that initiating structure consists of two sub-dimensions: directive leadership and autocratic leadership (Pearce et al., 2003). Directive behaviors include: initiation and organization of work group activity, assignment of tasks, specification of the way work is to be conducted, emphasis on goal attainment, and the establishment of clear channels of communication. Conversely, autocratic behavior consists of making decisions without consulting team members (Schriesheim, House, & Kerr, 1976). In sum, the set of leader behaviors that are encompassed by initiating structure are primarily orientated towards task accomplishment.

Recent findings indicate that initiating structure has moderate relationships with leadership outcomes (.29) and with group–organization performance (.23) (Judge, Piccolo, et al., 2004). The current meta-analysis seeks to replicate and extend Judge and colleagues' research, by more narrowly defining the criterion of interest in terms of team performance outcomes and by expanding the base of literature from which an estimate of these relationships is derived. As initiating structure consists of behaviors which work to ensure that members have a clear sense of direction and purpose, it is expected to be positively related to perceptions of team effectiveness and team productivity. As seen in Fig. 1, these behaviors act as a resource that the leader uses to manage material and personnel resources through the provision of clear, compelling, purpose-orientated direction. This direction serves to guide team action towards goal attainment.

### 2.1.3. *Boundary spanning*

Boundary spanning communication involves both politically orientated communication that increases the resources available to the team and networking communication which expands the amount and variety of information that is available to the team (Brown & Eisenhardt, 1995). Boundary spanning involves collaborating with others outside the team, scanning the environment, and negotiating resources for the team (Hirst & Mann, 2004). Given the reported definitions of boundary spanning behaviors, and the finding that boundary spanning is more highly related to the leader's role as a director than as a facilitator (Edmondson, 2003), this behavior is conceptualized herein as having primarily a task-focus.

Hirst & Mann (2004) found that boundary spanning was related to the team's perceptions of their effectiveness across time ( $r = .30, .49$  at 4 months and 1 year, respectively). Similarly, Edmondson (2003) found that boundary spanning was not only associated with successful technology implementation within teams ( $r = .66, p < .01$ ), but was more effectively done by the leader than by the team. Moreover, as boundary spanning involves scanning the environment and collaborating with others outside the team (see Hirst & Mann, 2004), this leadership behavior is foundational to complete the leadership function of information search and structure. Information gained via this effort is paramount to maintaining situational awareness and facilitating effective problem solving. Boundary spanning can also be tied to the process of gaining organizational support through the process of negotiating resources and collaborating with others outside the team. This is vital for material resources to be effectively managed.

## 2.2. *Person-focused leadership*

Given the sample of leadership behaviors that have been empirically examined within teams, four categories of behaviors are subsumed under person-focused leadership: transformational, consideration, empowerment, and motivational. Each of these leadership behaviors is discussed in turn, with an emphasis on how they relate back to the framework.

### 2.2.1. *Transformational*

Transformational leadership is characterized by a meaningful and creative exchange between leaders and subordinates in order to bring about vision driven change in people and context (Bass, 1985). Transformational leaders also take calculated risks to proactively seize opportunities and solve organizational problems (Tichy & Ulrich, 1984).

This type of leadership adopts a balanced approach, whereby leaders facilitate followers' efforts to solve complex problems while concurrently developing subordinates so they are more prepared to address future problems (Bass, Avolio, Jung, & Berson, 2003). Burns (1978) argues that these leaders focus on transforming followers' motivational states to higher level needs, such as self-actualization. Bass (1999) argues that transformational leadership refers to the "leader moving the follower beyond immediate self-interest through idealized influence (charisma), inspiration, intellectual stimulation, or individualized consideration" (p. 11). Given the developmental and self-actualization aspects of many of the behaviors subsumed under transformational leadership, it is classified as a person-focused behavior within the current study.

The preponderance of empirical evidence supports the relationship between transformational leadership and performance (Avolio, 1999; Bass, 1998; Bass et al., 2003). For example, results of several meta-analyses support the linkage between transformational leadership and performance (DeGroot, Kiker, & Cross, 2000; Lowe, Kroeck, & Sivasubramaniam, 1996; Patterson, Fuller, Kester, & Stringer, 1995). Of particular interest to the current meta-analysis, is the research conducted by DeGroot and colleagues. This effort included a sampling of studies with group level operationalizations of leadership and performance. The current meta-analysis builds upon DeGroot and colleagues' research by conducting a more comprehensive integration of the empirical literature investigating leadership in teams and team performance outcomes.

While the predominant amount of work on transformational leadership has been conducted outside of team contexts theoretical arguments can be made to support the assertion that behaviors subsumed under transformational leadership should be positively related to team performance. Two of the most apparent areas in which transformational type behaviors would facilitate team performance outcomes are the management of material and personnel resources. Specifically, transformational behaviors such as individualized consideration and intellectual stimulation, when mixed with charisma, play a large role in creating a compelling direction and the provision of expert coaching. In turn, these are two of the conditions that enable the attainment of effective team performance outcomes (see Hackman, 2002).

### 2.2.2. *Consideration*

Consideration is a label for leader behaviors which are directed at maintaining close social relationships and group cohesion. In general, dyadic relationships characterized by consideration reflect two-way open communication, mutual respect and trust, and an emphasis on satisfying employee needs. In contrast to the task-focused behaviors subsumed under initiating structure, consideration behaviors reflect an emphasis on the person and personal relationships.

Perhaps the largest impact of consideration on team performance outcomes is within the leader's use of these behaviors during the provision of expert coaching. The provision of expert coaching has been argued to be a key avenue through which leaders can impact team performance because it is the means via which team coherence (i.e., shared affect, behavior, cognition) is often developed and maintained (Hackman & Wageman, 2005; Kozlowski, Gully, McHugh et al., 1996; Kozlowski, Gully, Salas, et al., 1996). In addition, recent findings have suggested that consideration has moderate relationships with leadership outcomes ( $r = .48$ ) and group-organization performance ( $r = .23$ ) (Judge, Colbert, et al., 2004; Judge, Piccolo et al., 2004). The current meta-analysis seeks to further refine these findings by focusing more narrowly on its relationship(s) with behavioral indices of team performance outcomes.

### 2.2.3. *Empowerment*

Empowerment behaviors refer to leader actions that emphasize the development of follower self-management or self-leadership skills (Pearce et al., 2003). Behaviors indicative of this leadership style are primarily developmental or person-orientated. Pearce et al. (2003) argue that the historical basis of this form of leadership lies within behavioral self-management, social cognitive theory, cognitive behavior modification, and participative goal setting. Therefore, the types of behaviors which are included within this category include actual empowerment behaviors, as well as those behaviors which serve to develop team members so that they are capable of self-management. Specifically, coaching, monitoring, and feedback behaviors are included, along with those indicative of participative, facilitative, and consultative leadership styles.

Theoretically, all of the behaviors mentioned above have been argued to facilitate effective team process and team performance outcomes through the promotion of team learning and adaptation (Burke, Stagl, Salas, Pierce, & Kendall, *in press*). For example, Edmondson and colleagues' research suggests coaching behavior is related to teamwork and team performance (Edmondson, 1999). Similar arguments have been generated by Hackman (2002) and Hackman & Wageman (2005). Monitoring and feedback have also long been researched within the teams domain as team behaviors

which promote effective team performance outcomes (Swezey & Salas, 1992). Mutual performance monitoring has been argued to allow teams to self-correct more efficiently when it is combined with back-up behavior such as the provision of feedback (Salas, Sims, & Burke, 2005). While most of the work cited above has been done without a focus on the team leader, all of the behaviors under the current empowerment category are arguably used by the leader in the management of personnel resources; specifically within the provision of expert coaching and development.

#### 2.2.4. Motivation

Motivational behaviors refer to those behaviors which promote team members exerting continued effort, especially in times of difficulty. Behaviors indicative of this category include reward and recognition of performance as well as behaviors which insure that the needs and values of members are met through the provision of support for individuals and their efforts (Fleishman et al., 1991). Others using a functional approach to team leadership have argued that behaviors which serve to motivate team members are those such as: statements indicating encouragement, active consideration, and positive comments regarding member capabilities (Kane, Zaccaro, Tremble, & Masuda, 2002). Motivational behaviors do not involve coercion-based influence.

From a theoretical standpoint, team member motivation is an antecedent to effective team process and performance. It has been argued by Salas et al. (1992) that teams must possess both task-work and teamwork skills in order to perform effectively. The degree of motivation that is held by team members translates into the amount and duration of effort that is put forth in the task. Moreover, as teams often operate within environments that require adaptive behavior team members must be motivated to exert the extra effort that it takes to adaptively coordinate within such environments.

### 2.3. Task interdependence, leadership behavior, and team performance outcomes

This research also included exploratory moderator analyses. A moderator analysis was conducted to investigate the importance of leadership behavior in teams to team performance outcomes (i.e., perceived team effectiveness, team productivity, team learning) across different levels of task interdependence. Task interdependence is the degree to which team members must depend upon one another to perform their tasks in route to goal accomplishment (Saavedra, Earley, & Van Dyne, 1993). As the level of task interdependence increases, so do the dependencies amongst team members and thereby the coordination requirements needed to achieve efficacious performance outcomes.

Researchers have documented four levels of task interdependence that can be arranged in a hierarchy reflecting the degree to which one team member's actions are contingent upon the actions of another team member. Task interdependence can be characterized along a continuum of interconnectivity demarcated by pooled, sequential, reciprocal (Thompson, 1967), and team dependencies (Saavedra et al., 1993). While no prior research has investigated the relative importance of leadership under varying conditions of interdependence, increasing levels of task interdependence mandate increasingly tight couplings between members and thus imply the need for escalating levels of leadership.

## 3. Method

### 3.1. Identification and selection of studies

A number of approaches were used to identify studies for inclusion in this meta-analysis. First, electronic searches of computerized databases were conducted using the key words *team leadership*, *group leadership*, *team leaders*, and *group leaders*. The electronic databases ScienceDirect, EBSCOhost, Academic Search Premier, Business Source Premier, PsycARTICLES, and PsycINFO were searched for studies published between 1900 and August of 2004. Second, back-tracing was conducted through the examination of the reference list of key articles. Third, computer and manual searches of conference presentations for the Academy of Management (AoM), the Society of Industrial and Organizational Psychology (SIOP), and the Interservice/Industry Training, Simulation, and Education Conference (IITSEC) dating back to the year 2000 were conducted. This process yielded well over one thousand potential studies for inclusion.

Next, two authors reviewed abstracts from the identified studies and came to a consensus concerning whether the source was relevant. Sources containing the following characteristics were excluded from further analysis: (a) dissertations, (b) use of clinical populations, (c) use of adolescents as participants, (d) limited to measurement of team leader traits, rather than behaviors, (e) limited to measurement of affective or cognitive team performance outcomes,

rather than behavioral performance outcomes, (f) limited to assessment of leadership structure, (g) collectives and groups characterized by a complete lack of task interdependence, and (h) studies failing to report a usable test statistic. This effort resulted in the identification of 231 published and unpublished studies with potential for inclusion in the current meta-analysis.

### 3.2. Coding

A coding scheme was developed to quantify study characteristics and results (see Table 2). Two industrial/organizational psychologists were trained in the use of the coding scheme. Inter-rater agreement was established at the end of training by having each rater independently code 14 articles. Inter-rater agreement on key indices (i.e., effect size, inclusion/exclusion determination, predictor and criterion reporting, level of interdependence) ranged from 90–100%. Therefore, the remaining articles were equally divided among the two raters. Inter-rater agreement was checked at the conclusion of the rating process by having 7 articles independently coded by each rater. Interrater agreement remained high on all key indices. Any initial disagreements or ambiguities about whether to include a particular study in the meta-analysis were resolved via consensus. A subset of the information gleaned from the coding scheme was then used for the current meta-analysis.

### 3.3. Meta-analytic technique and decisions

After applying all selection criteria the final data set contained 50 empirical studies with 113 effect sizes. The accumulation of study findings was aided by the computer program, *Comprehensive Meta-Analysis*, Version

Table 2  
Information extracted from each study

Variable coded	Description
Citation	Complete reference
Publication type	<ul style="list-style-type: none"> <li>● Journal,</li> <li>● Book chapter,</li> <li>● Conference proceeding/presentation,</li> <li>● Technical report</li> </ul>
Research type	<ul style="list-style-type: none"> <li>● Passive-observational,</li> <li>● Quasi-experimental,</li> <li>● Experimental</li> </ul>
Nature of organization and participant sample	Description of the organization or place where the study took place (i.e., the task environment) and descriptive information on participants (e.g., number, gender, etc.)
Team type	Categorization using Sundstrom et al. (2000) typology — production, service, project, executive/management, action/performing
Team size	<ul style="list-style-type: none"> <li>● Dyad (<math>n=2</math>)</li> <li>● Medium (3–10)</li> <li>● Large (<math>&gt;10</math>)</li> </ul>
Assigned or emergent leader	<ul style="list-style-type: none"> <li>● Assigned</li> <li>● Informal</li> </ul>
Ad hoc or intact team	Categorization as to whether team was ad hoc or an intact team
Predictor report type	Categorization as to whether predictor was self-report or objective
Predictor description	Predictor name and how it was operationalized
Criterion report type	Categorization as to whether criterion was self-report or objective
Criterion description	Criterion name and how it was operationalized
Predictor reliability	Reported reliability of predictor
Criterion reliability	Reported reliability of criterion
Effect size	Effect size
Length of intervention (if applicable)	Degree of time intervention was instituted
Level of interdependence	Categorization using Saavedra et al. (1993) typology — pooled, sequential, reciprocal, team. Categorized based on task description
Recommendation	Recommendation to either include or exclude study with supporting rationale



1.0.25 (Borenstein & Rothstein, 1999). In order to aggregate findings across studies, all test statistics were converted to an index of effect size (i.e.,  $r$ ). Raw  $r$  values were utilized as the use of the Fisher  $z$  transformed may result in an overestimate of the population  $r$  (Hunter, Schmidt, & Jackson, 1982; Schmidt, Gast-Rosenberg, & Hunter, 1980).

Several studies contained more than one effect size estimate. Often, researchers will simply average or combine effect sizes from different measures within a single study prior to combining studies. When appropriate, this is the approach taken in the current research. For example, when team performance outcomes were measured in the same study by both self-ratings and observer ratings, the two outcome ratings were combined. However, when it was logically and theoretically inappropriate to combine effect size estimates from two different measures, they were kept separate. For example, it is logically inconsistent to combine the measurement of team outcomes resulting from autocratic and democratic leadership found within a given primary study.

Due to a lack of proper reporting of reliability information in primary studies, a decision was made not to correct for unreliability in predictor and criterion measures. Predictor reliability information was missing in approximately 50% of the primary studies. Reliability reporting for criterion measures was even worse. For those studies that reported predictor reliability in a common form (i.e., coefficient alpha), the average estimate obtained was .885. As existing reliability estimates were generally high, corrections for predictor unreliability would not appreciably improve our overall effect size estimates. In addition, the large amount of missing data made corrections for unreliability impractical.

In an effort to balance validity and reliability concerns, studies were weighted by the inverse of effect size sampling error, which is a function of sample size. The “combined effect” is a weighted mean of the effect in all included outcomes. Consequently, studies providing more information (i.e., those with larger sample sizes) are given greater weight in the combined test. This weighting scheme has the desired result of minimizing the variance of weighted average effect sizes (Hedges & Olkin, 1985).

Finally, within the current study a random effects model was used to analyze the data. Although results were computed under both models (see Tables 3–5) only the results from the random effects model are described. Random effects models typically provide a more conservative estimate of the effect with a slightly wider confidence interval and higher standard error (Shadish, Cook, & Campbell, 2002). This is in line with the goal to

Table 3  
Summary of main analyses

Hypothesis/description	$r$	95% C.I.	Number of studies	Number of effect sizes	$N$ (teams)
H1: Task-focused leadership—perceived team effectiveness <sup>a</sup>	.333	.258–.404	19	25	1655
H2: Task-focused leadership—team productivity/quantity <sup>b</sup>	.203	.082–.317	5	6	271
H3: Task-focused leadership—team learning	–	–	–	–	–
H4: Person-focused leadership—perceived team effectiveness <sup>c</sup>	.036	.301–.416	37	55	3139
H5: Person-focused leadership—team productivity/quantity <sup>d</sup>	.284	.233–.332	12	24	1396
H6: Person-focused leadership—team learning <sup>c</sup>	.560	.338–.723	3	3	200

<sup>a</sup> Brannick, Prince, Prince, & Salas (1995), Cooper & Wakelam, (1999), Flood et al. (2000), Higgins & Routhiaux (1999), Keller (2001), Kim, Min, & Cha (1999), Kline (2003), Kolb (1992), Michaelsen (1973), Nealey & Blood (1968), Norrgen & Schaller (1999), Oh, Kim, & Lee (1991), Spangler & Braiotta (1990), Stoker & Remdisch (1997), Stoker, Looise, Fisscher, & deJong (2001), Taggar & Seijts (2003), Thamhain (2004), Tschan, Semmer, Nagele, & Gurtner (2000), and Watson, Johnson, & Zgourides (2002).

<sup>b</sup> Bird (1977), Kahai, Sosik, & Avolio (1997), Kane et al. (2002), Keller (1992), and Komaki, Desselles, & Bowman (1989).

<sup>c</sup> Brewer, Wilson, & Beck (1994), Burpitt & Bigoness (1997), Edmondson (1999), Edmondson (2003), Flood et al. (2000), Gordon & Brannick (1999), Hirst, Mann, Bain, Pirola-Merlo, & Richver (2004), Keller (1992), Kim et al. (1999), Kirkman & Rosen (1999), Kline (2003), Kolb (1992), Lim & Ployhart (2004), McDonough & Pearson (1993), Michaelsen (1973), Nealey & Blood (1968), Norrgen & Schaller (1999), Odusami, Iyagba, & Omirin (2003), Pearce & Herbik (2004), Pearce & Sims (2002), Pirola-Merlo, Hartel, Mann, & Hirst (2002), Pratt & Jambalvo (1981), Sivasubramaniam et al. (2002), Smith et al. (1994), Smith-Jentsch, Salas, & Brannick (2001); Sosik (1997), Sosik, Avolio, & Kahai (1997), Sosik, Kahai, & Avolio (1998), Spangler & Braiotta (1990), Stoker & Remdisch (1997), Tesluk & Mathieu (1999), Thamhain (2004), Wageman (2001), Watson et al. (2002), and Wilson-Evered, Hartel, & Neale (2001).

<sup>d</sup> Ahearn, Ferris, Hochwarter, Douglas, & Ammeter (2004), Avolio, Waldman, & Einstein (1988), Bird (1977), Durham, Knight, & Locke (1997), Jung (2001), Kane et al. (2002), Keller (1992), Komaki et al. (1989), McDonough & Barczak (1991), Smith et al. (1994), Smith-Jentsch et al. (2001), and Sosik et al. (1997).

<sup>e</sup> Edmondson (1999), Hirst et al. (2004), and Kirkman & Rosen (1999).

Table 4  
Summary of sub-group analyses

Hypothesis/description	<i>r</i>	95% C.I.	Number of studies	Number of effect sizes	<i>N</i> (teams)
Transactional leadership—quality	.256	-.019–.494	3	3	228
Initiating structure—quality	.312	.225–.393	14	17	1242
Initiating structure—quantity	.203	.082–.317	5	6	271
Boundary spanning—quality	.488	.365–.594	3	5	185
Transformational leadership—quality	.336	.279–.391	19	25	1291
Transformational leadership—quantity	.252	.146–.353	5	6	330
Consideration—quality	.252	.082–.408	10	11	1019
Consideration—quantity	.222	.052–.380	3	3	136
Empowerment—quality	.465	.368–.551	15	19	829
Empowerment—quantity	.315	.226–.398	5	11	622
Empowerment—team learning	.560	.338–.723	3	3	200
Motivating—quantity	.293	.186–.393	1	4	308

present an accurate, but conservative estimate of the relationship between leadership behaviors and team performance outcomes.

## 4. Results

### 4.1. Main analyses

Table 3 contains a summary of the results of all the main analyses (i.e., effect sizes, upper and lower 95% confidence interval limits, and total sample size), which estimate the validity of task- and person-focused leadership behaviors on perceptions of team effectiveness, team productivity, and team learning. The first set of analyses investigated the relationship between task-focused leadership behaviors and the following team performance outcomes: perceived team effectiveness, team productivity, and team learning/growth, respectively. Results indicated that the use of task-related leadership behavior was positively related to perceptions of team effectiveness ( $r = .333$ ,  $p < .001$ ) and team productivity ( $r = .203$ ,  $p < .001$ ), accounting for 11% and 4% of the respective variance. Tests of heterogeneity were significant for the relationship between task-focused leadership behaviors and perceptions of team effectiveness ( $Q = 55.78$ ,  $p < .001$ ). The relationship between task-related behavior and team learning was not examined as there was not a large enough sample ( $n < 3$ ).

The second set of analyses examined the relationship between person-focused leadership behaviors, taken as a whole, and perceived team effectiveness, team productivity, and team learning, respectively. Results indicated that the

Table 5  
Summary of exploratory moderator analyses

Hypothesis/description	<i>r</i>	95% C.I.	Number of studies	Number of effect sizes	<i>N</i> (teams)
H7: Moderator–task interdependence					
Task-focused/perceived team effectiveness					
Low interdependence <sup>a</sup>	.108	-.031–.243	2	2	205
High interdependence <sup>b</sup>	.330	.229–.378	15	19	1352
Person-focused/perceived team effectiveness					
Low interdependence <sup>c</sup>	.226	.118–.328	3	4	325
High interdependence <sup>d</sup>	.344	.281–.405	30	46	2527

<sup>a</sup> Michaelsen (1973) and Stoker et al. (2001).

<sup>b</sup> Brannick et al. (1995), Cooper & Wakelam (1999), Flood et al. (2000), Higgins & Routhieaux (1999), Keller (1992) Kim et al. (1999), Norrgen & Schaller (1999), Nealey & Blood (1968), Oh et al. (1991), Spangler & Braiotta (1990), Stoker & Remdisch (1997), Taggar & Seijts (2003), Thamhain (2004), Tschan et al. (2000), and Watson et al. (2002).

<sup>c</sup> Wageman (2001), Stoker et al. (2001), and Michaelsen (1973).

<sup>d</sup> Keller (1992), Burpitt & Bigoness (1997), Brewer et al. (1994), Edmondson (2003), Flood et al. (2000), Gordon & Brannick (1999), Hirst et al. (2004), Keller (1992), Kim et al. (1999), Lim & Ployhart (2004), Norrgen & Schaller (1999), Nealey & Blood (1968), McDonough & Pearson (1993), Oh et al. (1991), Pearce & Herbig (2004), Pirola-Merlo et al. (2002), Pearce & Sims (2002), Pratt & Jambalvo (1981), Smith et al. (1994), Smith-Jentsch et al. (2001), Sosik et al. (1997), Sivasubramaniam et al. (2002), and Wilson-Evered et al. (2001).

use of person-focused leadership behaviors account for 13% of the variance in perceptions of team effectiveness ( $r = .360, p < .001$ ), 8% of the variance in team productivity ( $r = .284, p < .001$ ), and 31% of the variance in team learning ( $r = .560, p < .001$ ). Tests of heterogeneity were significant for the relationship between person-focused leadership behaviors and perceptions of team effectiveness ( $Q = 164.13, p < .001$ ).

#### 4.1.1. Sub-group analyses

Within the current initiative finer grained analyses were conducted, where permitted, to examine the relationship between specific task-focused (i.e., transactional behaviors, initiating structure, boundary spanning) and person-focused behaviors (i.e., transformational behaviors, consideration, empowerment, motivational behaviors) with each of the specific team performance outcomes. Although differential results are not specifically predicted by team performance outcomes, outcomes were separated as they reflect distinctly different phenomena.

#### 4.1.2. Task-focused behaviors

In an effort to further examine the relationship between specific task-focused leadership behaviors and perceived team effectiveness, transactional, initiating structure, and boundary spanning were examined independently. Results indicated that the use of transactional leadership behaviors were not significantly related to perceptions of team effectiveness ( $r = .336, p = .07$ ). This analysis was based on only three effect sizes and 228 teams. While the main analysis was not significant, tests of heterogeneity indicated that additional factors may be impacting the relationship ( $Q = 6.41, p < .05$ ), but with only three effect sizes further investigation was not possible. In contrast, support was found for the relationship between the use of initiating structure and perceptions of team effectiveness ( $r = .312, p < .001$ ). This analysis was based on 17 effect sizes and 1242 teams. Tests of heterogeneity were also significant ( $Q = 35.57, p < .005$ ). Finally, results indicated that boundary spanning behavior was positively related to perceptions of team effectiveness ( $r = .488, p < .01$ ).

Sub-analyses were also conducted to examine the relationship between task-focused leadership behaviors and team productivity/quantity. Results indicated that the degree to which initiating structure was used was positively related to the quantity of items (i.e., productivity) produced ( $r = .203, p < .001$ ). This result is based on six effect sizes and 271 teams. Analyses on the remaining behaviors and team productivity were unable to be examined due to the sample having less than three effect sizes reported for either combination of leadership behavior and team productivity. Finally, analyses concerning specific task-related leadership behaviors and team learning were not conducted as no specific studies were found within this area.

#### 4.1.3. Person-focused behaviors

In an effort to better understand the nature of leadership behaviors that were primarily focused on developing team members or maintaining socio-emotional aspects of the team, the relationship between specific person-focused leadership behaviors and perceived team effectiveness, team productivity, and team learning were examined. Results indicated that the use of transformational leadership behaviors were positively related to perceived team effectiveness ( $r = .336, p < .001$ ). This is based on 25 effect sizes and 1291 teams. The degree to which the leader used consideration behaviors was found to be positively related to perceived team effectiveness ( $r = .252, p < .005$ ) as was the use of empowerment ( $r = .465, p < .000$ ). Tests for heterogeneity were significant for both consideration ( $Q = 65.80, p < .001$ ) and empowerment ( $Q = 42.40, p < .001$ ). The relationship between motivational behaviors and perceived team effectiveness was not analyzed due to the small number of studies identified in this area.

Analyses were also conducted to examine the relationship between specific person-focused leadership behaviors and team productivity. In general support was found for the positive impact of each of the specific behaviors on team productivity. Specifically, the use of transformational leadership was found to account for 6% of the variance in team productivity ( $r = .252, p < .001$ ). Similar results were found with respect to consideration behaviors ( $r = .222, p < .01$ ), while empowerment accounted for 10% of the variance in team productivity ( $r = .315, p < .001$ ). The impact that motivational behaviors had on team productivity could not be examined due to the small number of these studies identified.

Finally, sub-group analyses were conducted to further investigate the relationship of transformational, consideration, empowerment, and motivational behaviors to team learning. Unfortunately, due to a lack of studies which examined the outcome of team learning in relation to each of the above behaviors only empowerment was examined. Results indicated that the use of empowerment behaviors explain 31% of the variance in team learning

( $r = .560$ ,  $p < .001$ ) with a  $Q$  value that is marginally significant ( $Q = 5.84$ ,  $p = .053$ ). While this result is based on only three effect sizes, each is pulled from different studies using different metrics; thereby serving to provide some additional confidence in the robustness of this finding (C.I. = .338–.723).

#### 4.2. Moderator analyses

Interdependence has been argued to be a defining characteristic of teams (Salas et al., 1992), however it is also well noted that teams tend to differ in terms of their ‘teamness’ or interdependence. Therefore, we sought to examine how task interdependence may moderate the impact that task-focused and person-focused leadership behaviors have on perceived team effectiveness, team productivity, and team learning. While it was desired to separately evaluate study results based on each of the four levels advanced by Saavedra and colleagues, in practice there is a dearth of published studies at the lower levels of team task interdependence (i.e., pooled, sequential). In fact, only four studies assessed leadership in teams at either the pooled or sequential levels. Therefore, a decision was made to combine the “lower” levels of interdependence (i.e., pooled and sequential) and compare the findings with those from “higher” levels of interdependence (i.e., reciprocal and team). Adopting this approach, 4 studies were excluded from this analysis because an insufficient amount of information existed to determine the level of interdependence within these primary studies.

Fifteen studies containing 19 effect sizes were located. Within this sample, task-focused leadership behaviors accounted for 11% of the variance in perceived team effectiveness within teams characterized as highly interdependent (see Table 5). Conversely, in teams with low interdependence task-focused leadership behaviors accounted for only 1% of the variance and were represented by only two studies each containing one effect size.

Person-focused leadership behavior was found to account for 12% of the variance in perceived team effectiveness within highly interdependent teams, while it accounted for only 5% of the variance within teams characterized by low task interdependence. As with task-focused leadership behaviors teams characterized by high task interdependence (30 studies, 46 effect sizes) were better represented than those containing low task interdependence (3 studies, 4 effect sizes). See Table 5 for more information regarding effect sizes, confidence intervals, and total sample per analysis.

Results suggest that interdependence may be acting as a moderator with regard to perceived team effectiveness, but the small number of effect sizes in the low interdependence category precludes an accurate and practical assessment of actual moderation. Due to small sample sizes the subset of analyses regarding team productivity and team learning were unable to be tested. These results begin to suggest that leadership in teams is relatively more important in achieving efficacious team performance outcomes when task interdependencies are higher. Therefore, as the dependencies between team members increase, so too apparently does the importance of leadership in orchestrating the adaptive coordination required to achieve effective team outcomes.

## 5. Discussion

The primary agenda driving this effort was to determine the relationship between leadership behaviors and behaviorally-based team performance outcomes. The meta-analytic results from this initiative suggest that both task- and person-focused leadership behaviors explain a significant amount of variance in team performance outcomes. Specifically, task-focused leadership behaviors within teams was found to explain 11% of the variance in perceived team effectiveness and 4% of the variance in team productivity. However, leadership behaviors orientated towards the person accounted for slightly more variance in perceived team effectiveness (13%) and productivity (8%) than task-focused behaviors. Behaviors that were orientated towards the person explained approximately double the variance in team productivity as compared to task-focused behaviors.

While results generally supported the efficacy of task and person-focused leadership behaviors on behavioral team outcomes, it was felt important to continue to examine the differential relationship of the specific leadership behaviors contained within the task- and person-focused categories with specific team performance outcomes. Table 6 presents a concise comparison of the sub-analyses that were conducted to examine specific leadership behaviors in more detail. By examining Table 6 in conjunction with Tables 3–5 several important points are highlighted. First, although researchers have argued that team leaders play a key role in the creation and maintenance of effective teams, there has been little research conducted on the relationship between leadership behaviors and team learning. If our understanding of the role that team leaders play in the creation and maintenance of adaptive teams is to progress, research must be

Table 6  
Percentage of variance in team performance outcomes accounted for by leadership behaviors

	Perceived team effectiveness (%)	Team productivity (%)	Team learning (%)
Task-focused	11	4	–
Person-focused	13	8	31
Transactional	6	–	–
Initiating structure	10	4	–
Boundary spanning	24	–	–
Transformational	11	6	–
Consideration	6	5	–
Empowerment	22	10	31
Motivational	–	9	–

done on team learning. Given the fluid environments that teams work within continuous learning is a key driver of a team's ability to remain adaptive and flexible (e.g., survive and effectively compete). Answers to such questions as the following are needed — what are the mechanisms by which leaders can facilitate team learning and the self-regulatory activities which contribute to team learning? The field is just now beginning to understand how to promote regulatory processes within teams; what can leaders do to facilitate these processes?

Second, results of the sub-group analyses indicated that while some leadership behaviors, such as consideration, seem to contribute equally to team performance outcomes (i.e., perceived team effectiveness, team productivity), others such as empowerment, transformational behaviors, and initiating structure are differentially related to the various outcomes examined. Boundary spanning and empowerment behaviors were found to explain large amounts of variance in perceived team effectiveness, explaining 24% and 22% of the respective variance. Actually, across the board empowerment behaviors (i.e., coaching, monitoring, feedback, etc.) were found to explain moderately high amounts of variance; up to 31% in team learning. Also interesting to note is that while task and person-focused leadership behaviors explained significant amounts of variance in team performance outcomes, the relationship between transactional behaviors and perceived team effectiveness was found to be positive but not significant. While only three studies were found that examined this specific relationship other leader behaviors having similarly low numbers were found to be significantly related to the various team performance outcomes. It may be that within teams where coordination and adaptation are necessary the type of motivation that is provided when transactional leadership behaviors are used alone is not enough to drive effective team performance. Finally, with regard to the sub-analyses it appears that, across the board, the relationship between leader behaviors and perceived team effectiveness is higher than that for team productivity. This difference may partially be due to the subjective nature of the team effectiveness ratings as compared to the objective nature of the team productivity criteria and should be investigated further.

In addition to conducting sub-group analyses an exploratory moderator analysis was planned to examine the role of task interdependence. The finding of a significant *Q*-statistic provided evidence that sufficient heterogeneity existed in the data to permit the search for moderators. In this case, the level of task interdependence (i.e., low versus high) appeared to interact with the relationship between leadership (both person- and task-focused) behavior in teams and perceptions of team effectiveness. Although an actual test of moderation (e.g., chi-square test of the difference between two independent correlation coefficients) was not performed, the results are suggestive of moderation. As expected, a larger effect size was found in teams operating at higher levels of interdependence (i.e., reciprocal, team) as compared to lower levels of interdependence. The effect size between person- and task-focused leadership in teams and perceived team effectiveness for highly interdependent teams was .344 and .330 (person-, task-focused, respectively) as compared to only .226 and .108 for teams operating at lower levels of interdependence. Further, while the confidence intervals for these comparisons did overlap, the redundancy was slight (.014 and .047, respectively; see Table 5). As only five of the fifty studies identified examined teams working on tasks with low interdependence, results pertaining to that subset should be viewed as tentative. In addition, because of the large difference in the effect sizes available for high and low interdependence groups, a standard moderator analysis was deemed impractical. Despite the fact that this finding should be viewed with caution, it does serve to both highlight the importance of task- and person-focused leadership behaviors in teams characterized by high task interdependence, and also to illustrate the need for studies to examine teams characterized by low task interdependence.

### 5.1. Limitations

When one seeks to ascertain the meaning of empirical findings, it is important to remember that the findings are grounded in a conceptual framework and must be interpreted as such. For this study, a wide net was cast with the goal of being able to generalize the findings beyond the context of a single leadership style, team type, or team task. To a large extent, the greater the methodological heterogeneity of a set of studies included in a meta-analysis, the greater the confidence that findings are not an artifact of individual study particulars (Cook & Campbell, 1979; Rosenthal & Rosnow, 1991).

Despite the above noted representativeness of the current study, three potential limitations should be noted. First, while extensive efforts were made to be inclusive by including a large number of primary studies, definitive conclusions regarding the validity of each included study cannot be made. More specifically, the literature in this area is populated largely with passive-observational studies in which there is little to no control in place, and consequently, more threats to validity may be operating which can alter or explain the current findings. Therefore, no claims concerning causality are implied in these analyses.

Second, “every meta-analysis has some inherent bias by virtue of the inclusion/exclusion criteria and the methods chosen to review the literature” (Rosenthal & DiMatteo, 2001, p. 66). Further, it is not possible to identify every article or paper that should be included in any given meta-analysis. To the extent that more heterogeneous and representative studies were not included in the analysis, the external validity of the current study may be threatened. However, judging by the current sample, the authors are confident that a diverse set of studies were included in the analysis (e.g., different types of leader behaviors, measures, methods, team types, settings).

Third, some readers may notice the diverse mixture of study characteristics and ponder whether the findings adequately summarize the sample data, and what exactly these findings reveal. Twenty years ago, Kraiger (1985) cautioned, “we seek to tell the apple from the orange, but you [the meta-analysts] try to tell us that all fruit is tasty” (p. 800). In the current case, the interested reader may want to learn about leadership behavior in a specific context and the results of meta-analyses only suggest that leader behavior is, in general, important to behaviorally-based team performance outcomes. However, it is also argued, “it is a good thing to mix apples and oranges, particularly if one wants to generalize about fruit, and that studies that are exactly the same in all respects are actually limited in generalizability” (Rosenthal & DiMatteo, 2001, p. 68). The authors could not agree more. It is exactly the diversity of studies included in the current analyses that permits generalization to and across a wide variety of team settings.

### 5.2. A look towards the future

This meta-analysis examined the relationship between leadership behaviors in teams and behaviorally-based team performance outcomes; however, a number of important issues remain to be addressed. This section provides a balanced discussion of empirical, research design, and conceptual issues. In regard to the conceptual issues raised by the present endeavor, particular emphasis is placed on the following two issues: (1) examining ‘team leadership theories’ as opposed to the predominant focus on ‘theories of leadership’ applied in team settings, and (2) advancement and investigation of multilevel models of team leadership.

The evidence resulting from the current research effort is no doubt encouraging; however, there are some caveats that accompany these findings. Most of these issues result from tradeoffs made between parsimony and description of the relationships between leader behaviors and behaviorally-based team performance outcomes. One issue of particular importance concerns the nature of the predictor emphasized in the current endeavor. Specifically, while these results provide insight into the importance of the behavioral aspects of leadership, research is still needed to examine how much, if any, incremental variance in team performance outcomes is explained by leader behaviors beyond that already captured by leader traits, knowledge, abilities, affect, and cognitive action. Similarly, the amount of incremental variance explained by behaviorally-based theories of leadership in team processes should also be investigated.

The nature of the criterion utilized in this study, namely behaviorally-based team performance outcomes, also raises additional avenues for research. Research is needed to investigate the relationships between leadership and alternative team performance outcomes such as emergent affective states (e.g., viability, cohesion, satisfaction) and emergent cognitive states (e.g., shared mental models, transactive memory systems, psychological safety).

Also, a host of moderator variables remain to be explored which when examined will contribute to the science of teams. For example, the nature of the performance arrangement (i.e., co-located or distributed), may moderate the

relationship between leadership and team performance outcomes such that leadership becomes more important as newly distributed team members experience the loss of cues which typify collocated coordination. The stage of team maturation may also be a moderator variable worthy of investigation, as leadership may be less important to collectives who have matured from a team of experts to an expert team (see Morgan, Salas, & Glickman, 1994). Moreover, additional analyses are needed to investigate whether moderators such as level of task interdependence and team type alter the relationships between task and developmental leadership behaviors and team performance outcomes.

Another line of inquiry concerns the identification of the underlying mechanisms via which leadership in teams contributes to both team performance and performance outcomes. For example, research on accountability for feedback may shed light on why developmental leadership behaviors ultimately result in more effective team outcomes (see Rutkowski & Steelman, 2005). Moreover, team member perceptions of accountability may provide an explanatory mechanism for why team leaders can influence the behavioral and cognitive actions (i.e., back-up behavior, sensemaking) members choose to enact in the workplace. Developing an understanding of why leaders are able to influence the behaviors and cognitions of team members is of paramount importance, because it is the enactment of cognitive and behavioral actions over time which ultimately results in the team performance outcomes that are judged by stakeholders to be effective. In fact, leadership should be more strongly related to team performance than to team performance outcomes, as outcomes are influenced by a host of contextual factors that are beyond the volitional control of team members (see Campbell, 1990).

In addition to the analyses discussed above, there are also two more conceptual issues raised by this research. The first issue deals with the nature of the leadership examined in the current meta-analysis. Surprisingly, the results of the current literature review indicate the preponderance of empirical research conducted to date to examine team leadership has largely been grounded in traditional leadership theory. In other words, researchers are just transporting traditional theories of leadership to team settings. This is a concern because classical leadership theories have often been criticized for failing to fully appreciate and model the dynamism and complexities of team leadership (Kozlowski & Bell, 2002; Salas, Stagl, & Burke, 2004; Ziegert, 2004). In fact, most existing leadership theories are advanced as if “leader–follower relationships exist in a vacuum” (House & Aditya, 1997, p. 445).

In essence, traditional theories of leadership, even when they do consider leader to subordinate interaction, ignore the distinction between a mere surface-level collection of dyadic role exchanges and the true nature of team leadership. Modern theories, labeled herein as theories of ‘team leadership’, embrace the uniqueness of operating in a team by taking the larger context into account when initially theoretically framing leadership. This more customized theory building process will likely pay dividends in terms of the total variance accounted for by team leadership in team performance outcomes. Therefore, additional quantitative and qualitative inquiries are called for in order to test the growing number of team leadership theories that are by design sensitive to the characteristics of teams. These investigations will serve to establish the validity, boundary conditions, and practical implications of given team leadership theories, and thereby shed light on the value of team leadership for facilitating team performance and effectiveness. For example, recent theory building has considered leadership as an outcome of team processes, ultimately serving to enhance team adaptation and performance in subsequent cycles (Day et al., 2004). This approach complements existing approaches which consider leadership as an input to team performance, and thus warrants investigation.

A second, but related, general issue arising from the current effort concerns level of analysis issues in theory building. One implication of the above call to shift the emphasis from investigating leadership in teams to investigating team leadership is the need to adopt a multilevel perspective to guide team leadership theory building. To date, relatively few multilevel theories of team leadership have been advanced (for notable exceptions see Avolio & Bass, 1995; Pearce & Conger, 2003; Pearce & Sims, 2002). For example, Avolio & Bass (1995) adopted levels of analysis framework to extend Bass’ (1985) theory of transformational leadership by examining individualized consideration at three different levels of analysis including the individual, team, and organization culture. Likewise, more multilevel empirical research (e.g., Sivasubramaniam, Murry, Avolio, & Jung, 2002) is needed to test the assertions advanced by multilevel theories of team leadership.

## 6. Conclusion

This meta-analysis began with a single question, ‘Does leadership behavior in teams matter?’ Although simple, this sublime question has far reaching implications for the articulation of leadership theory and the application of

leadership in organizations. The sum of the evidence presented herein suggests a resounding yes; leadership in teams does matter when seeking to achieve team performance outcomes. Moreover, results suggest both task- and person-focused leadership are correlates of team performance outcomes. Initial evidence also suggests that leadership behaviors are differentially related to team performance outcomes (i.e., perceived effectiveness, productivity, team learning). At its lowest point, leadership behavior accounted for 4% variance, while at its highest accounting for 31%. Furthermore, task interdependence may moderate some of these relationships. While there is a range of correlations between the leadership behaviors and team performance outcomes, the authors view even the cases in which leadership behavior accounts for only 4% of the variance as being practically meaningful for two reasons. First, due to the complexity in organizations today an increase of 4% in productivity, effectiveness, or team learning would indeed be meaningful. Second, we hypothesize that when truly *team leadership* theories begin to be examined (e.g., Day et al., 2004; Kozlowski, Gully, McHugh et al., 1996; Kozlowski, Gully, Salas et al., 1996; Hackman, 2002) the relationship between leadership behaviors and team performance will increase.

The initial evidence that was gained as a result of this meta-analysis has some practical implications, a few of which will be highlighted next. For example, results suggest that both task- and person-focused leadership are almost equally important in team effectiveness and explain significant amounts of respective variance in team productivity. With regard to team effectiveness, while some may view their similar effect sizes as being non-informative it is suggested here that the opposite is true. This result provides support for the recommendation that leaders need to be trained in both types of behavior as they both contribute and are needed for teams to be effective. Without any regard to leadership, a similar finding has been reported in the teams literature concerning the importance of both task-work and teamwork behaviors as determinants of team effectiveness. The sub-group analyses also serve to inform this point. Based on initial analyses a recommendation to those charged with leader development might be to pay special attention to the development of boundary spanning and behaviors related to empowerment (i.e., coaching, feedback, monitoring, participatory behavior), as these two behaviors explained moderate-large amounts of variance in team performance outcomes. Taking transactional and consideration singly explained relatively small amounts of variance so these behaviors may receive less of a focus in leader development.

Furthermore, we argue that the findings and practical implications put forth within this meta-analysis offer important insight into understanding the relationship between leadership behaviors and team performance outcomes, no matter if the leadership function is shared as in co-leadership, rotated throughout the team, or primarily held by one individual. While shared leadership (i.e., co-leadership) may require additional coordination between those leading the team, as they now become in essence a multi-team system (leader–leader and leader–team), the fundamental leadership behaviors as applied to team members in facilitating team performance would not be different. At its most basic level, ‘team’ leadership is about what the leader or leaders do to facilitate team performance (i.e., interactions between the leader and team members). The findings reported within the current meta-analysis get at just that point.

The findings from this meta-analysis are, however, just the prelude to a much broader research agenda, as additional investigation is needed to illuminate why leadership in teams matters and under what conditions. Examination of the conditions under which leadership matters the most is of the utmost importance, as a myriad of teams is used in the workplace today. The findings from future investigations will provide the insight required to craft an efficient and productive development program for team leaders, as well as provide insight into other interventions which can be implemented to achieve team effectiveness. The authors hope the present endeavor provides a solid platform upon which to launch these future inquiries.

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