Review

Functional leadership in interteam contexts: Understanding 'what' in the context of why? where? when? and who?[☆]

Dorothy R. Carter[a,*], Kristin L. Cullen-Lester[b], Justin M. Jones[a], Alexandra Gerbasi[c], Donna Chrobot-Mason[d], Eun Young Nae[b]

[a] Department of Psychology, The University of Georgia, 125 Baldwin Street, Athens, GA 30602, USA
[b] Department of Management & Leadership, Bauer College of Business, University of Houston, 4750 Calhoun Rd, Houston, TX 77004, USA
[c] Department of Management, University of Exeter, Streatham Court, Rennes Drive, Exeter EX4 4PU, UK
[d] Department of Psychology, University of Cincinnati, 2600 Clifton Avenue, Cincinnati, OH 45221, USA

A B S T R A C T

Research on team leadership has primarily focused on leadership processes targeted within teams, in support of team objectives. Yet, teams are open systems that interact with other teams to achieve proximal as well as distal goals. This review clarifies that defining 'what' constitutes functionally effective leadership in interteam contexts requires greater precision with regard to *where* (within teams, across teams) and *why* (team goals, system goals) leadership processes are enacted, as well as greater consideration of *when* and *among whom* leadership processes arise. We begin by synthesizing findings from empirical studies published over the past 30 years that shed light on questions of what, where, why, when, and who related to interteam leadership and end by providing three overarching recommendations for how research should proceed in order to provide a more comprehensive picture of leadership in interteam contexts.

The use of teams[1] in organizations is ubiquitous (Mathieu, Hollenbeck, van Knippenberg, & Ilgen, 2017), and thus, a primary function of organizational leadership is to facilitate team success (Kozlowski, Mak, & Chao, 2016; Morgeson, DeRue, & Karam, 2010). Prior research on team leadership has focused primarily on identifying functional (i.e., effective; McGrath, 1962) leadership processes and relationships *within* teams without considering the larger systems within which teams are embedded (c.f. Hogg, van Knippenberg, & Rast, 2012). However, no team is a 'self-sufficient island'—teams must interact with and receive resources from their embedding environments in order to succeed (Ancona, 1990; Arrow, McGrath, & Berdahl, 2000; Kozlowski & Klein, 2000). Indeed, formal as well as informal team leaders often engage in boundary management activities to support their teams, such as acquiring external resources, promoting team interests, or interpreting the embedding environment (Ancona, 1990; Roby, 1961; Yukl, 2012; Zaccaro, Rittman, & Marks, 2001), and leadership is also needed to influence collaborative efforts across interdependent systems comprised of multiple teams pursuing shared goals (Carter & DeChurch, 2014; Ernst & Chrobot-Mason, 2011, a; Ernst & Chrobot-Mason, 2011, b; Mathieu, Marks, & Zaccaro, 2001; Pittinsky & Simon, 2007; Zaccaro, Marks, & DeChurch, 2012).

Despite many calls for researchers to adopt an 'external' perspective to the study of team leadership by conceptualizing teams as "open systems entailing complex interactions with people beyond their borders" (Ancona, 1990, p. 335), research on leadership in *interteam contexts* is relatively rare. For instance, studies based on the leadership theories that have received the most research attention in recent decades (i.e., Transformational Leadership Theory and Leader-Member

[1] In this paper, the term "teams" is used interchangeably with the term "groups". We acknowledge that there are often important distinctions between teams and groups in terms of the level of internal interdependence among members and the differentiation of members' tasks (Kozlowski & Ilgen, 2006). However, in the context of organizations, the similarities between teams and work groups are more relevant to the content discussed (i.e., members of both work groups and teams interact, pursue shared goals, see each other as members of the same collective, and are seen by others as members of the same collective; Ancona, 1990).

Exchange Theory [LMX]; c.f. Dinh et al., 2014), typically investigate the role of *intragroup* leadership processes and relationships for individuals and small groups. These studies seldom consider how the multilayered interdependencies inherent to interteam situations (i.e., interdependencies within as well as between teams; Kirkman & Harris, 2017) coupled with differences in the priorities, identities, and capabilities of different teams need to be managed in order to minimize intergroup conflict and maximize positive outcomes for specific teams and the larger systems they operate within.

The relative lack of research attention paid toward leadership in interteam contexts is unfortunate given that such contexts present serious challenges and tensions for leaders that go beyond the demands of leadership within isolated teams. For instance, leaders operating in interteam contexts often face trade-offs and competing demands and may choose to promote intrateam relations and team goals at the expense of interteam relations and system goals, or vice versa (Pittinsky & Simon, 2007). Interteam contexts may also require that leaders facilitate appropriate patterns of interactions between interdependent teams (Cummings & Kiesler, 2005; Luciano, DeChurch, & Mathieu, 2018) while avoiding 'over collaboration' between teams which can result in inefficiencies, role overload and decreased motivation (Cross, Rebele, & Grant, 2016; Davison, Hollenbeck, Barnes, Sleesman, & Ilgen, 2012; Marrone, Tesluk, & Carson, 2007). These tensions are not captured adequately by models of team leadership that focus primarily on leadership processes targeted within teams in support of team-level objectives.

We propose that defining 'functional' leadership becomes more complex when researchers shift from studying leadership within isolated teams to studying leadership in interteam contexts where teams are embedded in larger interdependent systems. As Fig. 1 illustrates, defining functional leadership in interteam contexts not only involves clarifying '*what*' leaders are, or should be, doing (e.g., enacting specific leadership behaviors, facilitating certain processes, relationships, and shared psychological states), '*who*' is leading (e.g., formal leaders, formal leadership teams, informal leaders) and '*when*' (i.e., under which circumstances), the multi-level nature of interteam contexts also demands more consideration of '*where*' leadership processes are targeted (e.g., within teams, across team boundaries) and '*why*' (e.g., to support team outcomes, to support system outcomes).

Using this framework to guide our review, we evaluate the degree to which empirical studies of leadership and/or the targets of leadership (e.g., interaction processes; psychological states) published over the past 30 years have addressed questions of *why, where, what, who,* and *when* related to leadership in interteam contexts. Although most leadership studies have taken an 'internal' perspective, several burgeoning streams of research in areas such as *group boundary spanning* (e.g., Ancona & Caldwell, 1990; Tushman & Scanlan, 1981), *group social capital* (e.g., Oh, Chung, & Labianca, 2004), *boundary spanning leadership* (e.g., Benoliel & Somech, 2015), *intergroup leadership* (Pittinsky & Simon, 2007), and *multiteam systems* (e.g., Mathieu et al., 2001; Zaccaro et al., 2012) are heeding calls to incorporate an external perspective by

investigating leadership processes targeted across team boundaries. Indeed, our review reveals that researchers have provided many insightful answers to the five questions in Fig. 1.

However, we also identified a number of limitations, assumptions, and divisions which pervade the extant literature on leadership in interteam contexts. Prior research has tended to progress in divergent directions, as evidenced by researchers' use of different terminology (e.g., *intergroup leadership*; Pittinsky, 2009; *multiteam leadership*; Zaccaro & DeChurch, 2012), examination of different types of interteam interactions (e.g., *ambassadorial activities*; (Ancona & Caldwell, 1992, b, 1992, a); *interteam coordination*; Davison, Hollenbeck, Barnes, Sleesman, & Ilgen, 2012), and focus on objectives at different collective levels of observation (e.g., *team-level*; Marrone, Tesluk, & Carson, 2007; *system-level*; DeChurch & Marks, 2006). Studies within disparate research streams are revealing different pieces of the larger puzzle of functional leadership in interteam contexts. Our review aims to bring these puzzle pieces together in order to provide a more comprehensive understanding of this important phenomenon. In closing, we offer three recommendations for how future integrative research might provide greater insight into how leaders (formal and informal) can navigate the tensions of interteam contexts and promote the success of *both* teams and the broader organizational systems teams operate within.

Review approach

The purpose of this review is to clarify the nature of functional leadership in interteam contexts, integrate and critically evaluate relevant findings from prior research, and identify promising areas for future inquiry. Broadly, leadership is defined as a "process of influencing others to understand and agree about what needs to be done and how to do it, and the process of facilitating individual and collective efforts to accomplish shared objectives" (Yukl, 2006, p. 8). Thus, leadership processes are situated in relation to specific individuals and/or collectives (*where is leadership targeted?*) and are enacted to facilitate specific objectives (*why is leadership enacted?*). As we depict in Fig. 2, these two questions of *where* and *why* are useful for organizing studies of leadership processes in intergroup contexts into four categories.

As shown in the first quadrant (*Category 1*) of Fig. 2, leadership processes might be targeted *within* teams (i.e., directly in relation to team members) in support of *team-level* objectives (e.g., team performance, viability, innovation). The vast majority of empirical studies of leadership fall within Category 1. Examples include studies of team leaders supporting team learning and adaptation (Edmondson, 1999; Kozlowski, Gully, McHugh, Salas, & Cannon-Bowers, 1996; Wageman, 2001), shared team leadership and team performance (Zhu, Liao, Yam, & Johnson, 2018), the effects of transformational leaders on the effectiveness of individuals and teams (Jung, Yammarino, & Lee, 2009), and the dynamic delegation of leadership responsibility within teams (Klein, Ziegert, Knight, & Xiao, 2006).

However, leadership processes targeted *across* team boundaries in support of team-level objectives (*Category 2*) as well as leadership
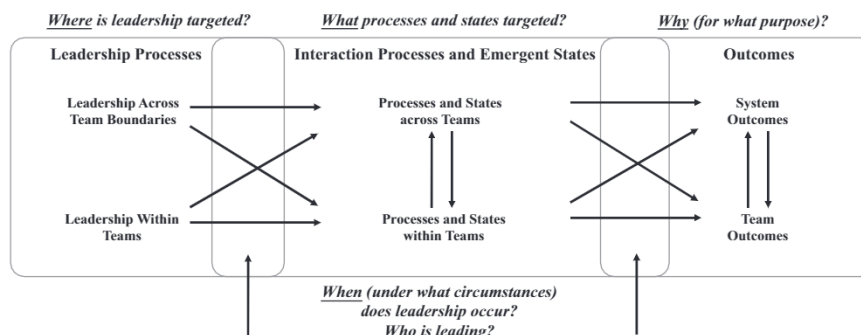

Fig. 1. Multi-level view of functional leadership in interdependent systems.

Where?

	Within Teams	**Across Teams**
Team Outcomes	*Category 1: Internally-focused leadership for the team* Influencing processes and states within teams to support team-level outcomes	*Category 2: Cross-boundary leadership for the team* Influencing processes and states across team boundaries to support team-level outcomes
System Outcomes	*Category 3: Internally-focused leadership for the system* Influencing processes and states within teams to support system-level outcomes	*Category 4: Cross-boundary leadership for the system* Influencing processes and states across team boundaries to support system-level outcomes

(Row group label: **Why?** spanning Team Outcomes and System Outcomes)

Fig. 2. An organizing framework for studies of functional leadership in interteam contexts.
Note. Shaded boxes are the focus of the current review.

processes targeted within (**Category 3**) and across (**Category 4**) team boundaries in support of *system-level* objectives are also critical to organizational success. Many scholars have emphasized that 'external' or 'cross-boundary' leadership behaviors that connect teams to entities and resources in their embedding environments represent a critical category of functional leadership behaviors for teams ((Ancona & Caldwell, 1988, 1990); Balkundi & Harrison, 2006; Choi, 2002; Contractor, DeChurch, Carson, Carter, & Keegan, 2012; Elkins & Keller, 2003; Marrone, 2010; Oh, Labianca, & Chung, 2006; van Knippenberg, 2003; Yan & Louis, 1999; Yukl, 2012; Zaccaro et al., 2001). Further, many important objectives, including patient care (DiazGranados, Dow, Perry, & Palesis, 2014), disaster response (DeChurch et al., 2011), new product development (Marks & Luvison, 2012), and military operations (Davison, Hollenbeck, Barnes, Sleesman, & Ilgen, 2012), represent distal goals that require leadership processes to guide coordinated efforts within and across multiple teams (Mathieu et al., 2001).

Literature search

We used the 2 × 2 framework shown in Fig. 2 to guide our review of previous research on leadership in interteam contexts. In recent years, researchers have summarized studies of leadership processes targeted within teams in support of team objectives (Category 1) in multiple well-executed reviews of team leadership (e.g., Kozlowski et al., 2016; Mathieu et al., 2017; Morgeson et al., 2010) and specific leadership theories (e.g., LMX; Martin, Guillaume, Thomas, Lee, & Epitropaki, 2016; Transformational Leadership; Banks, McCauley, Gardner, & Guler, 2016; Wang, Oh, Courtright, & Colbert, 2011; shared leadership within teams; Zhu et al., 2018). Therefore, we focused our review on studies falling within one or more of the *other* three categories shown in Fig. 2.

The starting point for our literature search was 1990, corresponding with the appearance of articles calling for researchers to take an 'external' perspective to better understand the performance of teams (Ancona, 1990). To identify articles, we conducted a search across a variety of relevant online databases (Business Source Complete, ECONLit, E-Journals, Medline, PsycINFO, and Psychology and Behavioral Sciences Collection via the EBSCOhost research databases) for articles published between January 1990 and August 2019. We used this approach in order to ensure that we identified articles from a range of academic disciplines. We required that articles contain one or more of the following search terms in the abstract: inter-group or intergroup; inter-team or interteam; boundary spanning or boundary activity;

multi-team or multiteam; and between team(s). Additionally, we manually searched the reference sections of key publications (e.g., review articles, meta-analyses, empirical papers with high citation rates) on the topics of teams, multiteam systems, boundary spanning, and intergroup relations in order to identify additional articles. We limited the results of our search to peer-reviewed academic journals published in English. Our initial search yielded 2617 articles.

In the next step, we removed duplicate articles and conducted a *pre-screening process* of the articles' titles and abstracts using the following inclusion criteria: (1) the research appeared to be an *empirical study* (i.e., qualitative/quantitative/mixed-methods); (2) the research investigated how *leaders* (formal and/or informal) (a) manage or engage in interaction processes across group boundaries (excluding the boundary between employees and customers), (b) affect intergroup relations, and/or (c) facilitate superordinate (interteam/system-level) outcomes, and/or the research investigated processes or psychological states that could be *targets* of cross-boundary leadership for team goals (Category 2) or leadership in support of system goals (Categories 3 & 4); (3) the research was conducted within a workplace context or a laboratory simulation of a workplace context; (4) the research focused on variables at the individual-, team-, and/or system-level of analysis (but were not studies of entire firms); and (5) the publication outlet's impact factor was equal to or higher than 1.0 (based on the Journal Citation Reports, 2018). We chose this impact factor as an inclusion criterion to ensure that our review drew on studies that are generally representative of research in the field and met standardized criteria for research quality. Additionally, we excluded articles that did not consider outcomes at *collective* levels of analysis (e.g., studies showing that *individuals* who carry out boundary spanning activities gain personal benefits were excluded if they did not also discuss implications for collectives; e.g., Burt, 1992). Further, as the focus of this review is on cross-boundary leadership in the context of *work teams*, we followed the precedent of Hogg et al. (2012) and did not consider studies examining leadership across other demographic or social identity boundaries. This pre-screening process resulted in 407 articles of which 405 full texts were retrievable.

During the pre-screening process, we chose to err on the side of inclusion (based on information provided in the article title and abstract). In the final step of our process, the full text of each article was reviewed carefully by the authorship team to confirm its relevance to this review based on the inclusion criteria described previously. This vetting process resulted in a smaller subset of 160 articles. Table 1 provides a list of the journals and the numbers of articles within each

Table 1
Journal titles and numbers of articles organized by disciplinary area.

Applied Psychology, Management, Human Resource Mgt., Org. Studies (94)
Academy of Mgt. J. (20)
Org. Science (6)
Human Relations (5)
J. of Applied Psych. (5)
J. of Mgt. (5)
J. of Mgt. Studies (5)
Small Group Research (5)
Administrative Science Quarterly (4)
J. of Org. Beh. (4)
Leadership Quarterly (4)
Group & Org. Mgt. (3)
J. of Occupational & Org. Psych. (3)
Mgt. Decision (3)
European J. of Work & Org. Psych. (3)
J. of Business Research (2)
Org. Studies (2)
American J. of Community Psych (1)
Applied Psychology: An Int. Review (1)
British J. of Industrial Relations (1)
British J. of Mgt. (1)
Frontiers in Psych. (1)
Int. J. of Human Resource Mgt. (1)
J. of Mgt. & Org. (1)
J. of Leadership & Org. Studies (1)
J. of Managerial Psych. (1)
J. of Small Business Mgt. (1)
Org. Beh. & Human Decision Processes (1)
Personnel Psychology (1)
Personnel Review (1)
Scandinavian J. of Mgt. (1)
Team Performance Mgt. (1)

Innovation, Mgt. Science, Operations, Strategy & Technology Mgt. (27)
Creativity & Innovation Mgt. (3)
Int. J. of Project Mgt. (3)
J. of Engineering & Technology Mgt. (3)
J. of Product Innovation Mgt. (3)
R & D Mgt. (3)
European J. of Innovation Mgt. (2)
Information & Software Technology (2)
Project Mgt. J. (2)
European J. of Operational Research (1)
Int. J. of Operations & Production Mgt. (1)
J. of High Technology Mgt. Research (1)
J. of Technology Mgt. Research (1)
Research Policy (1)
Technology Analysis & Strategic Mgt. (1)

Health & Medicine (9)
Int. J. of Medical Informatics (2)
J. of Oncology Practice (2)
Health & Social Care in the Community (1)
Health Promotion Int. (1)
Health Services Research (1)
Int. J. of Environmental Research & Public Health (1)
Intensive Care Medicine (1)

Other Disciplines (e.g., Int. Business, Education, Cognition, Information Systems, Human Factors, Accounting, etc.) (30)
Human Factors (2)
Industrial Marketing Mgt. (2)
J. of Service Research (2)
Accounting Review (1)
ACM Trans. on Mgt. Information Systems (1)
Cognition, Technology & Work (1)
Communication Research (1)
Cross Cultural Mgt. (1)
Educational Administration Quarterly (1)
European J. of Marketing (1)
IEEE Trans. on Software Engineering (1)
Information Systems J. (1)
Int. J. of Business Communication (1)
J. of Information Technology (1)
J. of Int. Mgt. (1)
J. of Knowledge Mgt. (1)
J. of Mgt. in Engineering (1)
J. of Mgt. Information Systems (1)

Table 1 (*continued*)

J. of Marketing Mgt. (1)
J. of Public Administration Research & Theory (1)
J. of World Business (1)
Network Science (1)
Public Administration (1)
Public Mgt. Review (1)
Small Business Economics (1)
Social Networks (1)
Sociological Focus (1)

Note: *n* = 160 articles; Beh. = Behavior; Int. = International; J. = Journal; Mgt. = Management; Org. = Organizational, Organization; Psych. = Psychology; Trans. = Transactions.

journal included in our review. Notably, although many of the articles in this final list did not reference 'leadership' explicitly, they highlighted intrateam or interteam processes, states, or other attributes that are potential targets of leadership in interteam contexts.

Article coding

The first four authors extracted and coded each of the 160 articles to identify the ways in which each article addressed the core elements of functional leadership in interteam contexts (*why*? *where*? *what*? *when*? and *who*?). We coded the answers to these five questions into emergent sets of categories (see Table 2 for category examples). As a quality check, every article was reviewed by at least two authors, and any inconsistencies were discussed until consensus was reached. We also identified characteristics of the research designs used in each study. As Table 3 summarizes, the majority of articles presented quantitative research (64%); among these was a predominance of quantitative field studies (53%), which were predominantly cross-sectional (87%) using samples of working adults (90%). Studies of leadership (or targets of leadership) for team goals were more likely to use quantitative (78%) rather than qualitative methods (12%), studies of leadership for system goals were more evenly split between quantitative (53%) and qualitative methods (39%). We were encouraged to see studies using experimental designs (still only 10% of the total studies reviewed here) and mixed method approaches (9%). Additionally, many studies incorporated best practices for addressing common-method bias including crisscross designs, temporal separation, and/or multi-source data (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003; Podsakoff, MacKenzie, & Podsakoff, 2012; Podsakoff & Organ, 1986).

Synthesis of research on leadership in interteam contexts

Our review revealed that most empirical studies have answered the question of 'why' leadership is enacted (i.e., for what purpose), by emphasizing *one* of two levels of collective objectives: (1) leadership supports *team-level* objectives; or (2) leadership supports *system-level* objectives, with only a small subset of studies emphasizing both team- and system-level objectives simultaneously. We used the questions of 'why' and 'where' leadership occurs (internally-focused or cross-boundary) in interteam contexts to organize and synthesize findings from prior research (see online Appendix A[2] for key findings from each of the 160 articles). In the following sections, we clarify how the extant literature has addressed the remaining three questions needed to understand 'functional' leadership in interteam contexts (*what*? *when*? and *who*?) for each category.

Category 1: Internally-focused leadership for the team

Although a comprehensive review of empirical studies focused

---

[2] doi: 10.17605/OSF.IO/AHTYF

Table 2
Five core questions specifying the nature of functional leadership in intergroup contexts.

Core questions	Exemplar answers derived from extant literature
1. Why is leadership enacted? (i.e., for what objective(s)?)	Team goals without mention of interteam interdependence (Ferguson, Ormiston, & Wong, 2019; Keller, 2001); team goals in intergroup competitions or coopetitions (Bullinger, Neyer, Rass, & Moeslein, 2010; Carbonell & Rodríguez Escudero, 2019; van Bunderen, Greer, & van Knippenberg, 2018); team goals in collaborative interteam contexts (Brion, Chauvet, Chollet, & Mothe, 2012; Cha, Kim, Lee, & Bachrach, 2015; Drach-Zahavy, 2011; Grippa et al., 2018; Somech & Khalaili, 2014; Tasselli & Caimo, 2019); system goals (Curnin, Owen, & Trist, 2014; Millikin, Hom, & Manz, 2010; Schotter & Beamish, 2011; Zolper, Beimborn, & Weitzel, 2013); both team and system goals (Friedman & Podolny, 1992; Lee & Sawang, 2016; Lanaj, Hollenbeck, Ilgen, Barnes, & Harmon, 2013; Susskind, Odom-Reed, & Viccari, 2011)
2. Where is leadership targeted?	Within teams (Birkinshaw, Ambos, & Bouquet, 2017; Tippmann, Scott, & Parker, 2017; Zhang, Wu, & Henke, 2015); across team boundaries (Cuijpers, Uitdewilligen, & Guenter, 2016; Kratzer, Gemünden, & Lettl, 2008; Uitdewilligen & Waller, 2018)
3. What processes and states are targeted by leadership?	Communication (Bearman, Paletz, Orasanu, & Thomas, 2010), collaboration (Beck & Plowman, 2013), learning (Chan, Pearson, & Entrekin, 2003), coordination (Newell & Swan), identity (Gray, Bunderson, Boumgarden, & Bechara, 2019), cohesion (Ferguson & Blackman, 2019), trust (Chen & Wang, 2008)
4. When is leadership occurring? (i.e., under what circumstances?)	During changes in organizational structure (Birkinshaw, Ambos, & Bouquet, 2017); when performing non-routine tasks (Chung & Jackson, 2013); while working in complex and dynamic environments (Curnin, Owen, & Trist, 2014; DeChurch et al., 2011; Gerber et al., 2016; Kellogg, Orlikowski, & Yates, 2006); during initial project phases (Hoegl, Weinkauf, & Gemuenden, 2014); when new resources are needed (Waldman & Atwater, 1994); given certain levels of interteam interdependence (Benoliel & Somech, 2015; Glynn, Kazanjian, & Drazin, 2010; Kennedy, Sommer, & Nguyen, 2017; Litchfield, Karakitapoğlu-Aygün, Gumusluoglu, Carter, & Hirst, 2018; Widmann & Mulder, 2018)
4. Who is leading?	Formal team leader (Melo, Cruzes, Kon, & Conradi, 2013); multiple formal leaders of different teams (Gasson, 2005); formal leadership team (de Vries, Hollenbeck, Davison, Walter, & Van der Vegt, 2016; DeChurch & Marks, 2006); team members without formal positions of authority (Ingvaldsen & Rolfsen, 2012; Johannessen, McArthur, & Jonassen, 2015; Marrone, Tesluk, & Carson, 2007)

Table 3
Summary of methodological approaches in reviewed studies.

	Team objective(s) emphasized	System objective(s) emphasized	Overall
No. of studies	n = 73	n = 87	n = 160
Analytic approach	12% (9) qualitative methods; 78% (57) quantitative methods; 10% (7) mixed methods	39% (34) qualitative methods; 53% (46) quantitative methods; 8% (7) mixed methods	27% (43) qualitative methods; 64% (103) quantitative methods; 9% (14) mixed methods
Sample	92% (67) working adults; 7% (5) student samples; 1% (1) other	89% (77) working adults; 9% (8) student samples; 2% (2) other	90% (144) working adults; 8% (13) student samples; 2% (3) other
Study design	4% (3) experiments; 70% (51) field/quasi-field; 11% (8) case studies; 15% (11) combination	15% (13) experiments; 38% (33) field/quasi-field; 29% (25) case studies; 9% (8) combination of designs; 3% (3) simulations; 3% (3) archival; 2% (2) secondary data	10% (16) experiments; 53% (84) field/quasi-field; 21% (33) case studies; 12% (19) combination of designs; 2% (3) simulations; 2% (3) archival; 1% (2) secondary data
Temporal design*	90% (46) cross-sectional; 10% (5) longitudinal	82% (27) cross-sectional; 18% (6) longitudinal	87% (73) cross-sectional; 13% (12) longitudinal
Common methods bias*	37% (19) mention explicitly; 27% (14) addressed through design elements; 14% (7) statistical tests	30% (10) mention explicitly; 21% (7) addressed through design elements; 15% (5) statistical tests	35% (29) mention explicitly; 25% (21) addressed through design elements; 14% (12) statistical tests
Endogeneity*	6% (3) mention explicitly; 2% (1) statistical tests	3% (1) mention explicitly; 3% (1) statistical tests	5% (4) mention explicitly; 2% (2) statistical tests

Note. * indicates calculations based on quantitative field studies.

solely on leadership targeted within teams in support of team objectives (Category 1) is beyond the scope of this review, we summarize and draw from Category 1 research in order to make comparisons between the ways in which researchers have addressed questions of 'what,' 'when,' and 'who' in Category 1 versus the other categories.

What? Identifying leadership processes targeted within groups has been a primary focus of leadership research for nearly a century. These studies typically leverage a functional perspective, arguing that team leadership is 'effective' if it ensures that all functions critical to task accomplishment and team maintenance are addressed (Fleishman et al., 1991; Hackman & Walton, 1986; McGrath, 1962; Mumford, Zaccaro, Harding, Jacobs, & Fleishman, 2000).

Early influential studies organized leadership behaviors within groups into two broad categories: *task-oriented behaviors* such as planning, defining and clarifying objectives, problem-solving, and monitoring goal progress; and *person-oriented* behaviors such as showing concern for followers and expressing confidence in followers' abilities

(e.g., Katz, Maccoby, Gurin, & Floor, 1951; Stogdill, 1948, 1974; Stogdill & Coons, 1957). Additionally, with the rise of theories such as Charismatic Leadership (House, 1977; Weber, 1947), researchers began to emphasize *change-oriented* leadership behaviors (Yukl, 2012), which are aimed at spurring and/or inspiring change within organizations.

The core idea that effective leadership within groups involves task-, person-, and change-oriented behaviors has continued to pervade more recent theories of leadership, such as Transformational/Transactional leadership theory (e.g., Bass, 1985, 1990; Bass & Avolio, 1993, 1994); Servant Leadership theory (Greenleaf, 1970, 1977); and relational theories, including LMX (Dansereau, Graen, & Haga, 1975; Graen, 1976; Graen & Cashman, 1975). For example, person- and change-oriented behaviors are central to a transformational leadership style (e.g., providing individualized consideration; articulating an inspiring vision for the future; Bass, 1985). Servant leaders are thought to engage in both person-oriented behaviors (e.g., demonstrate empathy, develop and empower followers) and task-oriented behaviors (e.g., problem-

solving, decision-making) guided by a deep understanding of the organization's mission (Liden, Panaccio, Hu, & Meuser, 2014). Graen & Uhl-Bien, 1995 argue that leaders should nurture high-quality LMX relationships with followers characterized by trust, liking, and respect and offer followers opportunities to develop through task-related roles and responsibilities. Moreover, less effective leadership styles, such as Laissez Faire leadership (Bass & Avolio, 1993) or Abusive Supervision (Mackey, Frieder, Brees, & Martinko, 2017; Tepper, 2000, 2007) are often depicted as the absence and/or opposite of task-, person-, and/or change-oriented leadership behaviors (e.g., a lack of structure; hostile rather than positive relationships).

Within teams, research suggests that task-oriented leadership behaviors can initiate structure for the team by (for example) clarifying team task requirements, establishing reward contingencies, specifying procedures, and providing feedback on task progress. Both task- and person-oriented leadership can help team members work effectively by facilitating the interpersonal interactions, cognitive architectures, feelings, and attitudes associated with effective teamwork (Burke et al., 2006). Research on teams has also emphasized the importance of change-oriented leader behaviors that support team innovation, creative performance (Gil et al., 2005; Spreitzer, De Janasz, & Quinn, 1999), and processes of collective transformation and learning (Kozlowski et al., 1996). For instance, leaders who leverage after-action reviews (Villado & Arthur Jr, 2013), establish a psychologically safe team climate (Edmondson, 1999), and/or facilitate a shared understanding of the task and team environment (e.g., through various task-oriented and relational-oriented behaviors), can help teams better recognize and learn from prior mistakes and prepare for future challenges (Garvin, Edmondson, & Gino, 2008).

Indeed, meta-analytic evidence has demonstrated that task-, person-, and change-oriented leadership processes are positively associated with a variety of organizational outcomes, including group performance (Burke et al., 2006; DeRue, Nahrgang, Wellman, & Humphrey, 2011; Judge, Piccolo, & Ilies, 2004). DeRue et al. (2011) showed that initiating structure (i.e., an aspect of task-oriented leadership) represented the strongest predictor of group performance whereas change-oriented behaviors (e.g., transformational leadership) and person-oriented behaviors (e.g., consideration) accounted for sizeable but lesser portions of the total variance.

When? Like many other areas of organizational scholarship (Gardner, Harris, Li, Kirkman, & Mathieu, 2017) as research on leadership within teams has matured, many leadership scholars have moved beyond simple categorization schemas of 'what leaders do' (e.g., task-, person-, change-oriented leadership) to specify critical boundary conditions or moderator variables that determine *when* leadership behaviors and/or relational processes within teams are more or less effective. For instance, classic theories, including Fiedler's (1967) contingency theory and House's (1971) path-goal theory proposed a variety of situational factors—both *internal* (e.g., group structure, task demands, team member attributes, state of relations between leader and team) as well as *external to the team* (e.g., turbulence, uncertainty, leader positional power)—that determine the effectiveness of leadership behaviors within groups. Recent empirical studies in Category 1 have echoed these core ideas by investigating a variety of internal moderators, including leader attributes (Hu & Judge, 2017), task demands (Farh & Chen, 2018), task interdependence (Aubé & Rousseau, 2005), virtuality (Purvanova & Bono, 2009), and team diversity (Salazar, Feitosa, & Salas, 2017), and external moderators, such as environmental uncertainty (Sung & Choi, 2012), organizational norms (Newell, David, & Chand, 2007), top management support (Hurt, 2016), and national culture (Salk & Brannen, 2000).

Researchers have also begun to emphasize the role of *time* as a key determinant of what constitutes 'functional' leadership for teams. For example, Kozlowski et al. (1996) conceptualized leadership as involving dual roles that can operate simultaneously: "(1) a *developmental role*, linked to the process of team evolution, and (2) a *task contingent*

role that shifts its functional emphasis in response to the dynamics of team task cycles" (p. 262). Whereas the developmental role involves a longer-term process through which leaders help team members meld into a cohesive, culturally unique entity, the task contingent role is a more dynamic process which involves developing team goals, strategies, and expectations during phases of low intensity or routine task conditions, and intervening during higher intensity, stressful phases. Morgeson et al. (2010) connected these ideas with Marks, Mathieu, and Zaccaro' (2001) argument that teams cycle through repeating phases of 'transition' and 'action' to identify functional leadership behaviors corresponding to these two task phases. Morgeson and colleagues argue that during transition phases, leadership should help compose the team, define the mission, establish expectations, structure and plan tasks, train and develop the team, and provide sensemaking and feedback. During action phases, leadership should monitor the team's progress toward goals, manage team boundaries, challenge the team, perform the team task, solve problems, provide resources, encourage team self-management, and support a positive social climate.

Who? Lastly, the question of '*who is leading*?' (i.e., claiming and/or being granted leadership influence; DeRue & Ashford, 2010) has become increasingly relevant as organizations have embraced flatter decentralized and team-based work structures (Mathieu et al., 2017) where *informal* leaders and leadership processes often operate alongside or in the absence of *formal* leaders (Zaccaro, Heinen, & Shuffler, 2009). Indeed, although most studies of team leadership have focused on the role, actions, and relationships of formal leaders (e.g., team managers), researchers often depict leadership as a dynamic and emergent social process of influence, which can occur up, down, and across the organizational hierarchy (Carter, DeChurch, Braun, & Contractor, 2015; Cullen-Lester & Yammarino, 2016; Day, Gronn, & Salas, 2004; Follett, 1924; Hollander & Julian, 1969; Pearce & Conger, 2003). For example, a growing stream of research argues that there are benefits for teams who engage in *shared* forms of leadership – "a dynamic, interactive influence process among individuals in groups for which the objective is to lead one another to the achievement of group or organizational goals or both" (Pearce & Conger, 2003, p. 1). Meta-analyses have found that shared leadership is positively associated with teamwork processes and emergent psychological states, and accounts for unique variance in team performance beyond that accounted for by vertical (formal) leadership (D'Innocenzo, Mathieu, & Kukenberger, 2016; Nicolaides et al., 2014; Wang, Waldman, & Zhang, 2014).

Recently, several studies have suggested that identifying 'who' is doing 'what' 'when' (in terms of *time*) holds the potential to advance the understanding of functional leadership within teams substantially (e.g., Aime et al., 2014; Contractor et al., 2012). For example, Morgeson et al. (2010) posited that team leadership (during transition and/or action phases) might originate from *formal* and/or *informal* sources who reside *inside* or *outside* the team. Further, they proposed that different sources of leadership might be better suited to fulfill different leadership functions depending on the *phase* (transition/action) of team performance. For example, an external/formal leader may be best positioned to compose and monitor the team, establish expectations and goals, manage team boundaries, provide resources, and encourage self-management. In contrast, internal/informal leaders may be best suited to structure, plan, and perform the team task, solve problems, and support the social climate. Some activities, like providing feedback can be effectively fulfilled by all sources of leadership. Although these propositions have yet to be fully tested, they suggest many interesting lines of inquiry for future research.

Category 2: Cross-boundary leadership for the team

We identified 73 articles investigating cross-boundary leadership processes enacted in support of *team* objectives (Category 2). A subset of these articles discussed leaders, managers, and/or leadership processes explicitly (*n* = 17 articles). These studies convincingly

demonstrate that (formal) leaders often play an active role in managing interaction processes and relationships with external entities. However, the majority of articles (76%) did not invoke the notion of leadership explicitly, but rather, identified cross-boundary interaction processes, states, and/or interventions that could be targets of leadership in interteam contexts (and/or enacted by informal leaders). In combination, Category 2 studies help clarify *what* cross-boundary leadership processes are relevant to team outcomes, point to important boundary conditions for cross-boundary leadership (*when*), and begin to identify the ways in which responsibility for cross-boundary leadership might be distributed across different people (*who*).

What? The literature on 'boundary spanning' has provided substantial insight into *what* 'external' team activities might constitute cross-boundary leadership processes and/or might serve as targets of leadership in interteam contexts (Ancona, 1990; Joshi, Pandey, & Han, 2009; Marrone, 2010). In particular, Ancona and Caldwell's seminal program of research (1988; 1990; 1992a; 1992b) identified several broad categories of external functions that link a group to its external environment, with the external environment referring to "actors or other teams residing within or outside of the boundary spanning team's host organization" (Marrone, 2010, p. 914). *Scouting* activities—what Marrone (2010) refers to as 'information search'—include collecting information and resources from relevant outside parties, constructing a mental model of the external environment (e.g., who does/does not support the team), and seeking feedback from members of other groups. *Ambassadorial* activities (or 'representational activities' in Marrone, 2010) reflect attempts to: open up lines of communication with other groups (even without a specific purpose), inform others about the team's progress, negotiate and coordinate details of intergroup interactions (e.g., establishing give-and-take in intergroup exchanges), advocate for team needs (e.g., to those with greater power), and influence or 'mold' the external environment to suit the team's agenda. *Guarding or sentry* activities involve managing (e.g., delaying, delivering, denying) the flow of information and resources *from* the group to external entities and protecting the team's boundary by selectively allowing information to *enter* the team. Lastly, *task coordinator* activities involve synchronizing work efforts with other teams and monitoring joint progress and strategy toward the accomplishment of shared goals.

Although researchers have referred to external team activities in different ways and have offered different categorization schemes (e.g., compare Faraj & Yan, 2009; Somech & Khalaili, 2014; Marrone, 2010; Joshi et al., 2009; Ancona & Caldwell, 1998, 1992a), there is a clear consensus across prior research about the *relevance* of external activities for team outcomes ((Ancona & Caldwell, 1992, b, 1992, a); Marrone, 2010). External activities can have direct effects on team outcomes by acting as conduits for information and resources that enable effectiveness and innovation (Ancona, 1993; (Ancona & Caldwell, 1992, b, 1992, a); Choi, 2002; Marrone, 2010). For example, many studies have demonstrated positive relationships between external activities that support the acquisition of information, expertise, and resources with outcomes such as team creativity and innovation (e.g., Anderson & Kragh, 2015; Büchel, Nieminen, Armbruster-Domeyer, & Denison, 2013; Tippmann, Scott, & Parker, 2017). External activities can also have *indirect* effects on team outcomes by impacting processes and psychological states within teams (see Fig. 1). For instance, Henttonen, Johanson, & Janhonen, 2014 found that team identity strength mediates the relationships between both bonding (i.e., within teams) and bridging (i.e., with external entities) social network ties and team performance. They argue that whereas bonding ties support team identity by enabling similar attitudes and perceptions (and hence liking) within teams, bridging ties support team identity by offering team members information about 'outgroups' and thereby afford more elaborated intergroup social comparisons.

Notably, cross-boundary processes are not always *beneficial* for all team outcomes. For example, Ancona, (1990) distinguished different 'types' of teams based on the degree to which they leveraged cross-

boundary processes. 'Informing' teams remained isolated until they were ready to inform outsiders of their progress; 'parading' teams emphasized team building and achieving visibility while passively observing other teams; and 'probing' teams actively engaged outsiders, revised their knowledge through external contacts, initiated programs with outsiders, and promoted their teams' achievements within their organizations. Although 'probing' teams were rated as the highest performers, these teams also suffered *short-term* decrements in member satisfaction and team cohesion. Other studies have shown that cross-boundary processes can have negative implications for team performance. For instance, in a study of the communication networks of 31 interdisciplinary hospital teams, Grippa et al., 2018 found that more effective teams were more inwardly focused and less connected to outside members as compared to less effective teams. Similarly, a study of inter-university project teams found that the degree to which team leaders and team members bridged structural holes (i.e., connected disconnected others; Burt, 1992) was negatively associated with team performance (Susskind, Odom-Reed, & Viccari, 2011). Indeed, promoting an external focus and encouraging team members to engage in cross-boundary processes may deplete limited resources (Choi, 2002), distract attention from critical internal processes, and ultimately diminish the cohesiveness of the team (Oh et al., 2006).

In fact, there is growing consensus that there are *trade-offs* inherent to cross-boundary processes for teams, and thus, functional leadership involves helping teams strike an appropriate balance of internal and cross-boundary interactions and team permeability. On the one hand, when team boundaries are *highly* permeable, team cohesiveness and coordination are likely to suffer. Effective team functioning may depend on members differentiating themselves as a coherent unit, separate from the broader environment, by establishing a workspace, rules for operating, and goals specific to the team (Choi, 2002; Sundstrom, DeMeuse, & Futrell, 1990). Actions by leaders that *reinforce* team boundaries and affirm teams' unique identities can decrease the likelihood that members will experience identity threat when they interact with other teams (Connaughton, Williams, & Shuffler, 2012; Ernst & Chrobot-Mason, 2011, a; Hogg et al., 2012). On the other hand, if team boundaries are not *sufficiently* permeable, teams can experience isolation and may not benefit from the knowledge and expertise of other teams. For instance, several studies we reviewed referenced the '*not-invented-here*' syndrome (Katz & Allen, 1982), which refers to a tendency for teams who have had success in the *past* to become insular, believe they have a monopoly on the field, and thus, reject new ideas and influence from outside sources. The not-invented-here syndrome can be a major barrier to the inflow of new knowledge and thus, can stifle continued team learning and creative performance (Chen & Wang, 2008). Therefore, leadership is needed to manage the permeability of team boundaries by both protecting and insulating teams from negative outside influences and additionally, by allowing resources and information to flow both into and out of the team as required by team task demands (e.g., Benoliel & Somech, 2015).

Indeed, the extant literature emphasizes that leaders and leadership processes play a primary role in managing (or enacting) external team activities. Leaders can support their teams by assuming responsibility for external activities. In this case, the external activities constitute 'external' or 'cross-boundary' leadership processes. For example, Takanashi & Lee, 2019 found that leaders of research and development (R&D) teams who engaged in boundary spanning behaviors were better able to mobilize external resources and enable their teams to achieve greater commercial success. The importance of leaders' participation in external activities is further supported by meta-analytic evidence showing that higher performing teams tend to have leaders who are well-connected in social networks, both internal and external to the team (Balkundi & Harrison, 2006) and studies showing that projects led by formal leaders who actively engage in external project championing receive more support from the organization and are more successful (Markham, Green, & Basu, 1991; Waldman & Atwater, 1994). Evidence

also suggests that leaders who have strong network ties can gather political support and scan for ideas, and team leaders with many structural holes in their networks (i.e., indicating brokerage between contacts who are not connected to one another; Burt, 1992) tend to be better able to protect their teams from outside interference (Brion, Chauvet, Chollet, & Mothe, 2012).

Leadership processes can also help set up conditions *within* teams that facilitate connections between team members and outsiders. Research shows that leaders influence the strategies teams use to interact with their environments, and in turn, differences in teams' strategies help explain outcomes such as team performance and team member satisfaction (Ancona, 1990). Edmondson, 2003 showed that effective team leaders not only use their positional status to reach out to other high-status individuals in the organization (i.e., span the team boundary), they also encourage team members to engage in boundary-spanning behaviors themselves by signaling the desirability of an external focus. Research has also shown that *empowering* (Chuang, Jackson, & Jiang, 2016) and *charismatic* (Knipfer, Schreiner, Schmid, & Peus, 2018) leadership behaviors within teams are linked to team external knowledge acquisition and the overall amount of team boundary-spanning behavior, respectively. Similarly, Cha, Kim, Lee, & Bachrach, 2015 showed that teams with transformational leaders had higher internal teamwork quality and were perceived as more collaborative by members of *other* teams, suggesting cross-boundary processes may be smoother for teams with transformational leaders.

Researchers have also identified a number of interventions leaders might use to increase teams' engagement in cross-boundary processes. For example, Chuang, Jackson, & Jiang, 2016 examined the effect of human resource management (HRM) systems in a sample of R&D teams. They find that when HRM systems support knowledge intensive teamwork, R&D teams have higher levels of external knowledge acquisition and internal knowledge sharing, and these effects are strongest when knowledge is less tacit and in the absence of 'empowering' leaders. Foss & Rodgers, 2011 showed that assigning managers to cross-unit initiatives was associated positively with their ability to use new information from other units. Further, studies in Category 2 have identified attributes at both individual- and team-levels that might be targets of leadership influence, such as individuals' task experience (Dahl & Pedersen, 2005), depth of functional expertise (de Vries, Walter, Van der Vegt, & Essens, 2014), and focus on goals with a 'global impact' (Pedersen, Soda, & Stea, 2019), and teams' functional diversity (Ancona & Caldwell, 1992, a), interdependence (Benoliel & Somech, 2015) and climate (Shin, Kim, & Hur, 2019).

When? With the awareness that cross-boundary processes can have positive, negative, null, and/or mixed effects on team outcomes, researchers are seeking to better understand the boundary-conditions or moderators that determine *when* cross-boundary interactions are most beneficial for teams. Paralleling research on leadership within teams (Category 1) studies in Category 2 have suggested that aspects of both the *internal* team environment and the broader *embedding* environment can determine the effectiveness of cross-boundary processes for teams. These studies are beginning to uncover how leaders might 'strike the right balance' by capitalizing on the benefits of cross-boundary processes for teams while mitigating the costs.

With regard to the *internal* state of the team, some researchers have considered how team properties, such as team task demands, or the levels of task interdependence determine the necessity of cross-boundary interactions. For example, Chung & Jackson, 2013 found that the relationship between external work relationships on team performance depends on the *routineness* of the tasks that are performed. When teams performed higher novelty tasks, the density of *both* internal and external networks were predictive of team performance; whereas performance on highly routine tasks did not benefit from dense external network connections.

The internal psychological state of the team can also determine the effectiveness of cross-boundary processes. For instance, psychological

properties associated with the 'not-invented-here' syndrome can reduce the effectiveness of cross-boundary processes by leading teams to discount the influence and ideas offered by outsiders. In support of this argument, Carbonell & Rodríguez Escudero, 2019 found the level of team *cohesion* moderated the effect of boundary spanning such that boundary spanning was less beneficial for highly cohesive teams. Likewise, Dokko, Kane, & Tortoriello, 2014 showed that R&D teams with strong *team identification* are less able to recombine knowledge from the external environment and generate creative ideas. In contrast, strong identification with an overarching superordinate group (e.g., a division) enhanced team creative generativity. Suggesting that the relationship between internal team psychological states and the benefits of cross-boundary processes is complex and non-linear, Bullinger, Neyer, Rass, & Moeslein, 2010 showed that in a competitive environment, teams with *either* very high or very low orientations toward cooperation with other teams (but not moderate) were most innovative.

In contrast to Category 1, very few Category 2 studies have considered how the *timing* of cross-boundary processes might impact their utility. Ancona & Caldwell, 1990 found that ambassadorial activities appeared to be most relevant during the creation and diffusion phases of a team project. They suggest that a strategy that works early in the life of a group may not support positive performance over time. Yet, the vast majority of studies we reviewed did not consider the types of temporal elements (e.g., phase of team performance, current task demands, developmental stage, team history) that have been the focus of recent leadership within teams (e.g., Aime et al., 2014; Kozlowski et al., 1996; Morgeson et al., 2010).

The nature of a team's external environment can also shape the effectiveness of cross-boundary processes for teams. For example, Faraj & Yan, 2009 found that under organizational conditions of high resource scarcity and task uncertainty, teams engaged in *increased* boundary activities—such as spanning, buffering, and reinforcing—in order to secure resources and develop psychological safety among team members. In another socio-structural study, Gleibs & Haslam, 2016 found that team members' willingness to support a leader's strategy for intergroup relations was dependent upon the current social context (i.e., social relations), and the team's status. When social relations were unstable, low status groups were more likely to support competitive leaders, but high-status groups were more likely to support cooperative leaders. Their findings underscore that leader effectiveness is contingent upon the social environment surrounding the team, as this alters how leaders are perceived internally.

Who? An equally important factor influencing the effectiveness of cross-boundary leadership may be *who* is assuming (or is granted) responsibility for cross-boundary leadership. Empirical research supports the active role that formal leaders play in cross-boundary leadership by directly engaging in cross-boundary activities on behalf of their team (e.g., Ancona, 1990; Liu, Schuler, & Zhang, 2013; Prysor & Henley, 2018). For example, Ancona & Caldwell, 1990 found that leaders engaged more frequently in ambassadorial, scouting, coordinating, and guarding activities than other members of the team. Further, Hirst & Mann, 2004 showed that boundary spanning behaviors performed by formal leaders had a *stronger* relationship with team performance than boundary spanning behaviors performed by team members.

However, a number of other studies have suggested benefits of distributing responsibility for boundary spanning across multiple members of the team (Ancona et al., 2002; Contractor et al., 2012; Elkins & Keller, 2003). Marrone, Tesluk, & Carson, 2007 demonstrated that teams are more effective when *more* team members are engaged in boundary spanning. The authors posit that the presence of multiple boundary spanners may reduce the demands placed on individual team members, increase the amount of resources brought into the team, reduce task uncertainty, and improve team member mental models regarding the external environment. Likewise, Ferguson & Blackman, 2019 found that boundary spanning was related to team cohesion and performance in top management teams and this relationship was

magnified as an increasing number of team members—aside from the CEO—participated in boundary spanning activities. Currently, however, both the extent to which formal versus informal leaders should engage in cross-boundary leadership and the extent to which 'boundary-spanning' behaviors reflect the phenomenon of 'leadership' remain poorly understood.

The effectiveness of teams' external activities may also depend on the specific *patterns* of relationships that leaders (formal/informal) have with people in the external environment (Balkundi & Harrison, 2006; Tushman & Scanlan, 1981). For example, Büchel, Nieminen, Armbruster-Domeyer, & Denison, 2013 found that new product development teams were most innovative when team members had trusting relationships with external 'project champions,' and broad (non-redundant) knowledge relationships. Oh, Chung, & Labianca, 2004 advanced the concept of *group social capital* in order to explain the importance of patterns of cross-boundary connections for team performance. Their results suggest that groups were most effective when group members had a moderate level of internal informal socializing relationships and a large number of ties to the leaders of other teams. Continuing this line of inquiry may prove invaluable to understanding the patterns of cross-boundary leadership relationships that promote team functioning.

Categories 3 and 4: Iinternally-focused and cross-boundary leadership for the system

In contrast to most studies within Category 1, studies of leadership in support of system goals rarely investigated and/or theorized about leadership (or targets of leadership) processes targeted *within* teams (Category 3) without *also* considering how these processes impact cross-boundary processes or states (Category 4). Therefore, reflecting the literature, we present findings from Categories 3 and 4 within a single section. We identified 86 articles that emphasized the achievement of superordinate *system-level* objectives requiring interdependent interactions across *multiple* teams. Thirty of these articles (35%) discussed leaders or leadership processes explicitly, and a small subset ($n = 7$ articles) evaluated both team- and system-level objectives simultaneously. Scholars have long recognized the importance of collaboration across multiple groups (e.g., teams, organizational units) for organizational success (Blake, Shepard, & Mouton, 1964; Brett & Rognes, 1986; Thompson, 1967). However, the majority (72%) of the studies we identified that focused on system-level objectives were published during the last decade, suggesting an increasing interest in the drivers and outcomes of interteam collaboration in interdependent systems.

What? Three separate, but conceptually related, areas of research have emerged over the past two decades which clarify *what* leaders and leadership processes need to accomplish in order to support superordinate goals. The first two areas, which we refer to as '*intergroup leadership*' research (Hogg et al., 2012; Pittinsky, 2009; Pittinsky & Simon, 2007) and '*boundary spanning leadership*' research (Ernst & Chrobot-Mason, 2011, a), respectively, have origins within social psychological theories of intergroup relations (Tajfel & Turner, 1979; Turner, 1985). These two domains focus explicitly on leaders and leadership processes in intergroup contexts and highlight the psychological challenges leaders are likely to face when leading multiple differentiated groups (e.g., identity threat, anxieties, misaligned goals, questions regarding the leaders' priorities and loyalties). The third area, '*multiteam system functioning*' (Mathieu et al., 2001; Shuffler, Jiménez-Rodríguez, & Kramer, 2015; Zaccaro et al., 2012), has its origins within industrial/organizational psychology and organizational behavior and draws heavily from theories of team functioning (Hackman & Morris, 1975; McGrath, 1964) and organizational design (e.g., Thompson, 1967). Although leadership is not always the primary focus of multiteam system research, most multiteam system studies explicitly or implicitly investigate leadership (in the functional sense) as a factor contributing to system functioning.

Studies of intergroup leadership, boundary spanning leadership, and multiteam systems all have in common an emphasis on conveying the *difficulties* associated with facilitating collaboration in interdependent systems comprised of multiple groups or teams. It is not uncommon for teams to succeed individually but fail collectively as a system due to critical misalignment and collaboration problems between teams (Marks, DeChurch, Mathieu, Panzer, & Alonso, 2005). Indeed, numerous studies began by highlighting interteam collaboration challenges. One recurring theme reflects the challenges associated with collaboration across teams with very *different* characteristics (e.g., geographic locations, norms, goals, priorities, areas of expertise; Luciano et al., 2018). For example, Alter, 1990 found that functional differentiation between teams in an interorganizational service delivery context created conflict and inhibited coordination. Likewise, Gerber et al., 2016 illustrated how clinical research systems struggled to coordinate due to a lack of collective identity, low cohesion, and differing goals between teams which ultimately bred competition. Similarly, in a study of university-firm R&D teams, Takanashi & Lee, 2019, found that teams struggled to overcome differences in culture, goals, and values, resulting in tensions that constructed barriers to collaboration.

Many studies also highlighted collaboration difficulties associated with *change* either within the system or external to the system. For example, in a study of multi-agency emergency management systems, Curnin, Owen, & Trist, 2014 described how dynamics inherent to the operating environment placed demands on teams to share information and make decisions quickly, hindering collaboration. Problems associated with dynamism have also been observed during crisis response as emergency medical services and emergency department teams must coordinate their efforts in a rapidly changing environment. Accordingly, Reddy et al., 2009 highlight how environmental dynamism in emergency response can make it difficult for geographically distributed teams to provide context during their between-team communications, negatively impacting system-wide collaboration. Likewise, Taneva, Grote, Easty, & Plattner, 2010, found that one of the most common causes of breakdowns in perioperative patient care was interteam coordination failures stemming from rapidly changing environments.

Luciano et al. (2018) theorize that the *reason* why differences between teams and excessive dynamism (e.g., uncertainty, fluidity, change) make interteam collaboration challenging is that these forces enhance the boundaries between teams and cause disruptions for system functioning. In turn, strong team boundaries and system disruptions can lead constituent members to orient their interactions toward fellow teammates and away from members of other teams, thus limiting the development of the *interteam* behavioral processes (e.g., coordination) and affective/motivational and cognitive psychological states (e.g., psychological safety, shared mental models) needed to achieve shared goals. However, as Luciano et al. emphasize, "this is not to suggest that low differentiation is the solution" (p. 1087). The differences between teams and the dynamic nature of complex environments are often the very reason multiteam systems are established in the first place. Thus, leadership and other boundary-related coordination mechanisms (i.e., potential targets of leadership) are needed in order to manage behavioral processes and psychological states within and across teams. Echoing Luciano and colleagues' argument that differences between teams should not be minimized, but instead, should be encouraged, Lanaj, Foulk, & Hollenbeck, 2018 found that multiteam systems perform most effectively when lower level component teams hold different preferences for risk-taking from their formal leadership teams. When component teams are allowed to hold and express differences in opinion from formal leaders the system may be more likely to learn and evaluate ideas during interteam communication and less likely to fall prey to 'groupthink' (Janis, 1971).

Interteam states and processes as targets of leadership. Paralleling research on leadership within teams in support of team objectives (Category 1) many of the studies we reviewed in Categories 3 and 4 highlighted behavioral processes and psychological states within, and

especially across, component team boundaries as key targets of leadership influence. For example, a few articles explored how 'boundary spanning' activities, defined broadly, are relevant to system objectives. Floyd & Wooldridge, 1997 found that middle managers' boundary spanning was related to their own strategic influence as well as the performance of the system as a whole. Glaser, Fourné, & Elfring, 2015 highlight how overlapping boundary spanning ties between middle managers and top management team members facilitates innovation across a multi-group business unit. Further, in a study of innovation in science and technology parks, Corsaro, Ramos, Henneberg, & Naudé, 2012 illustrate how boundary spanning drives resource transfer in interorganizational collaboration, supporting innovation.

Several studies emphasized the importance of interteam communication quality and quantity to system performance. For instance, Arnett & Wittmann, 2014 found that communication quality was positively associated with knowledge exchange between groups. Kratzer, Gemünden, & Lettl, 2008 examined the quantity of informal communication between teams. Interestingly, they found that there was an *inverted U-shaped* relationship between informal interteam communication and the creativity of multi-team R&D projects. The authors posit that although frequent interteam communication may lead to improved transfer of information, extremely high levels of interteam communication may prove to be a distraction, reducing individual autonomy and creativity, as well as overall efficiency.

However, the majority of studies in Categories 3 and 4 depict *interteam coordination* (i.e., synchronization of actions across teams; Marks, DeChurch, Mathieu, Panzer, & Alonso, 2005) as the most critical behavioral process associated with system outcomes, particularly within research on multiteam systems. Moreover, research on multiteam systems emphasizes that *leaders* and leadership processes play a primary role in facilitating interteam coordination. The majority of studies of leadership in multiteam system contexts have investigated leadership originating from a *formal leadership team* (i.e., an 'integration' team) that is situated hierarchically above other component teams.

For example, DeChurch & Marks, 2006 experimental study showed that training formal leadership teams on how to develop strategy as well as monitor and communicate information related to the multiteam task across teams fostered interteam coordination and system performance. Using the same simulation, Murase, Carter, DeChurch, & Marks, 2014, demonstrated that the development of system-wide shared mental models about interteam coordination is a key mechanism linking leadership teams' communication about strategy to interteam coordination and performance. Bick, Spohrer, Hoda, Scheerer, & Heinzl, 2018 also discuss the importance of shared mental models in multiteam contexts. The authors found that team processes such as planning led to mental model convergence and a lack of similar mental models prohibited effective coordination between teams. Findings from Firth, Hollenbeck, Miles, Ilgen, & Barnes, 2015 also emphasize the importance of shared mental models across teams. Their work showed that frame-of-reference training (i.e., training that reduced inconsistencies across teams regarding how shared problems are conceptualized) benefited within-team coordination, between-team coordination and multiteam system performance.

Formal leadership teams (or other formal boundary spanning mechanisms) are thought to be particularly critical in multiteam system contexts given the large size and complex processing demands of these systems (Davison, Hollenbeck, Barnes, Sleesman, & Ilgen, 2012). Indeed, Davison and colleagues demonstrated that unbridled coordination through mutual adjustment (operationalized as attending to the same element of a simulation at the same time) between lower level component teams was negatively associated with system performance. However, mutual adjustment processes between formal boundary spanners and leadership team members benefited system performance. Similarly, a study by de Vries, Hollenbeck, Davison, Walter, & Van der Vegt, 2016 demonstrated that intrapersonal functional diversity (i.e.,

breadth of intraindividual knowledge) facilitates horizontal coordination but inhibits aspirational behavior. However, this effect is moderated by vertical coordination, such that the negative effects of intrapersonal functional diversity are not realized in the presence of vertical coordination between component teams and the formal leadership team. Lanaj, Hollenbeck, Ilgen, Barnes, & Harmon, 2013 also found that decentralized planning structures (i.e., where plans are developed within lower level component teams first before being passed to the leadership team) had some benefit for system performance attributable to enhanced proactivity and aspiration levels, but also resulted in an overall negative effect attributable to risk taking and coordination failures.

In addition to behavioral processes and shared cognitions, many of the studies we reviewed emphasized the need for leadership processes to relieve *affective* and/or *motivational* barriers associated with interteam collaboration. For example, intergroup leadership theory (Pittinsky & Simon, 2007) suggests that leaders need to be mindful of the anxieties group members may experience when working with other groups and emphasizes that intergroup collaboration can threaten the distinctiveness of group identities and/or lead group members to feel that the value of their own group's identity is diminished (Hewstone & Brown, 1986). Pittinsky and Simon proposed that leaders may improve intergroup relations by encouraging contact between members of different groups, managing resources and interdependencies to reduce or prevent competition and conflict, promoting shared 'superordinate identities' as well as 'dual identities' to meet members' needs for distinctiveness and belonging, and fostering positive intergroup attitudes.

Several studies provide support for this idea. Richter, West, van Dick, & Dawson, 2006 demonstrated that the relationship between group identity and effective intergroup relations was positive at high levels of system identification but not at low levels. Likewise, Gumusluoglu, Karakitapoğlu-Aygün, & Scandura, 2017, found that benevolent leaders fostered team identification to the benefit of team innovative behavior, and simultaneously, fostered a cross-team identity positively influencing interteam innovative behavior. Cuijpers, Uitdewilligen, & Guenter, 2016 further illustrated that system identity was more important for multiteam system processes and performance than team identity. Similarly, Porck et al., 2018 showed that organizational identification supported intergroup strategic consensus whereas team identification can overpower it. In contrast, Porck et al., 2019 argued that superordinate identification develops feelings of uncertainty that deplete team members' cognitive resources. Supporting their hypotheses they find (using the same laboratory simulation context as several other multiteam system studies; e.g., Davison, Hollenbeck, Barnes, Sleesman, & Ilgen, 2012; Firth, Hollenbeck, Miles, Ilgen, & Barnes, 2015; Lanaj, Hollenbeck, Ilgen, Barnes, & Harmon, 2013) that team identification was positively associated with system performance, whereas system identification was negatively associated with system performance. Moreover, these effects were stronger under conditions of high task complexity and weaker under conditions of low task complexity. These mixed results suggest there are both downsides as well as upsides to team and system identification and begs the question of what role leadership should play in helping to balance and/or alleviate the apparent tensions in order to ensure optimal team and system functioning.

Hogg et al. (2012) also questioned the benefits of creating a *superordinate* identity and proposed that intergroup leaders should instead help groups develop *intergroup relational identities* (i.e., identities defined by the relationships between one's own team and other teams). They argue that intergroup relational identities can allow teams to maintain their distinctiveness, while also promoting effective collaboration. Empirical studies have not verified how leaders might facilitate the development of intergroup relational identities. However, theoretical work suggests that leaders can promote these identities through their *rhetoric* (e.g., by communicating about what resources the different teams might bring to and receive from intergroup

interactions), by *modeling* positive intergroup relations through their own cross-boundary processes, and by *facilitating* interactions among members of different teams (Ernst & Chrobot-Mason, 2011a; Hogg et al., 2012). By forming positive interpersonal relationships with members of each group, a leader may role-model desired intergroup relations and foster intergroup trust. However, leaders also need to be aware of and manage group members' perceptions of their intergroup behaviors. On the one hand, leaders may be perceived as less effective within their own groups if they are seen as being overly supportive of another group's goals, identity, or status (Hogg et al., 2012). On the other hand, a leader who exhibits an over-emphasis on activities within teams can undermine the team's ability to collaborate effectively with others (Pittinsky & Simon, 2007).

Similarly, Ernst and Chrobot-Mason's work on boundary spanning leadership (Ernst & Chrobot-Mason, 2011a; 2011b) proposed that leaders can use a series of interrelated strategies to promote collaborative psychological relationships between groups. The first strategy, 'managing boundaries,' begins *within* teams and consists of two steps: buffering and reflecting. The goal of buffering is to protect a team from undue outside influences, affirm the team's identity, and promote a sense of safety and security among team members. Teams then engage in reflecting by clarifying their own values, priorities, expertise, roles, and needs and prepare to share this information with members of other teams. Ernst and Chrobot-Mason argue that these *internally focused* leadership behaviors prepare teams to effectively engage with other entities within and beyond their organization as collaborative partners and help team members avoid identity threat. Second, they propose that it is important to have members of different groups connect on a personal level (i.e., without a focus on intergroup differences) to foster interpersonal trust.

In addition to (team, system, and/or intergroup relational) identities, several studies have identified other affective and motivational constructs within and across teams that might be targets of leadership influence in support of superordinate goals. For example, emerging research highlights the impact of states such as anxiety and psychological safety on system effectiveness. Park & DeShon, 2018 for example, studied how the quality of group discussions influences competition, fear, and greed between groups. Notably they find that groups who engaged in structured discussions were more likely to have high quality discussions, which in turn reduced greed and fear, and decreased the likelihood of competing with outsiders. In a study of ad hoc multiteam system aircrews, Bienefeld & Grote, 2014 found that psychological safety *within* teams mediated the effects of leader inclusiveness on team members' speaking up behavior within teams and boundary-spanners' speaking up across team boundaries. Interestingly, team boundary-spanners' perceptions of leader inclusiveness and psychological safety between teams had no effect on speaking up between teams; rather, it was the boundary spanners' perceptions of within team psychological safety that mattered most. Fleştea, Curşeu, & Fodor, 2017 also investigated psychological safety, exploring the influence of power disparity. The authors find that high power disparity positively influences system performance by engaging team members in a higher level of information processing, but also has negative effects on performance as it stifles perceptions of psychological safety and fosters a negative affective climate.

A subset of studies has explored the effects of motivational constructs such as goals, priorities, and collective efficacy. In a study of a semiconductor plant, Millikin, Hom, & Manz, 2010 illustrated that systems comprised of highly cohesive component teams that engaged in *self-management* (i.e., setting goals, focusing on intrinsic rewards, engaging in positive self-talk) were the most productive. In a case study of the response to the space shuttle Columbia disaster, Beck & Plowman, 2013 found that establishing, communicating, and monitoring shared superordinate goals was pivotal for the emergence of collaboration between teams. *Goal alignment* both within and between teams appears to be another important motivational factor. For instance, Meth,

Lawless, & Hawryluck, 2009 found that one of the greatest sources of conflict in intensive care units is the presence of incompatible and/or inconsistent goals regarding patient care across the various healthcare teams that comprise the unit, ultimately resulting in reductions in quality of care. Unfortunately, some research has shown that different teams are not necessarily *aware* of the fact that their goals are misaligned. For instance, Power & Alison, 2017 observed that different agencies in an emergency response system prioritized different goals (i.e., approach goals vs. avoid goals). Despite the observed goal conflicts, however, participants *believed* that their interagency goals were aligned with one another (according to their ratings of goal alignment), suggesting that members of different teams may be unaware of goal conflicts.

When? Studies in Categories 3 and 4 suggest that many factors can act as boundary conditions determining the effectiveness of specific leadership processes within and across teams. These factors may originate within teams (e.g., strength of team identification, Gumusluoglu, Karakitapoğlu-Aygün, & Scandura, 2017), across teams (e.g., level of interteam interdependence), and in the embedding environment (e.g., system dynamism; Uitdewilligen & Waller, 2018).

For instance, several studies have emphasized that the nature of *interteam interdependence* can play an influential role for various functions and outcomes both within and across teams. Marks, DeChurch, Mathieu, Panzer, & Alonso, 2005 showed that interteam processes were more critical at high levels of interteam interdependence than at lower levels where teams functioned under greater autonomy. In another study by Glynn, Kazanjian, & Drazin, 2010, team identification and team members' perceptions of interteam interdependence interacted to predict intentions to innovate such that individuals with high team identification *and* high interteam interdependence perceptions had *lower* intentions to innovate.

Recent work by Kennedy, Sommer, & Nguyen, 2017 utilized computational modeling and virtual experiments to investigate how leaders facilitate multiteam system communication across differing levels of team interdependence and project complexity. Their results show that the level of interdependence between teams influences the frequency with which leaders must make changes to communication plans in response to changing project complexity. Specifically, whereas systems with low to moderate interteam interdependence may rely on similar paths of communication for tasks of varying complexity (i.e., e-mail, video conferencing, sharing information indirectly through leadership), multiteam systems with high interteam interdependence must adapt their mix of communication tools depending on task complexity to prevent communication channels from becoming overburdened.

A number of Studies in Categories 3 and 4 have also begun to explore how leadership processes need to shift depending on the *timing* or *phase* of task performance. For example, DeChurch & Marks, 2006 evaluated leadership teams' use of strategizing behaviors during transition phases (e.g., gathering information, establishing roles and responsibilities, planning), and coordination behaviors during action phases (e.g., orchestrating actions, adapting roles and responsibilities to meet changing task demands, managing the flow of information). Other research has examined the critical role of leader planning during transition phases (Lanaj, Hollenbeck, Ilgen, Barnes, & Harmon, 2013) and the importance of effective team boundary management, especially in the *early* conceptual phases of a collaborative project to prevent teams from falling behind schedule (Hoegl & Weinkauf, 2005).

Further, Park & DeShon, 2018 found that discussion leaders who advocate for cooperation between teams are better able to influence team members *early* in the formation of a group when members are receptive to normative power. However, over time, high-quality internal discussions were more important for decreasing team members' feelings of greed and fear, and therefore their desire to compete with outsiders. In another recent study Quiroz, Brunson, & Bigras, 2017 present an in-depth case study of the dynamic processes of mutual adjustment that occurred between two professional teams participating

in a multicomponent community-based intervention (CBI). During the initial stages of collaboration, mutual adjustment involved division of roles and responsibilities based on areas of expertise, withdrawal from partner's area of expertise, and a relative paucity of direct interaction between groups. Interestingly, after a shock to the system, these rules transformed. Rather than dividing work based on expertise, the teams worked together directly to find a solution; new links were created to enhance intergroup communication; and groups came to function with a coherent joint approach to intervention. In combination, these studies exemplify the growing acknowledgement that the timing of leadership is a critical determinant of leadership effectiveness.

Who? A few studies have begun to illustrate the potential importance of *informal* leadership influence processes in the context of superordinate goals. For example, Kratzer, Gemünden, & Lettl, 2008 study of multi-team R&D projects found that there are benefits to a moderate overlap in formal and informal communication structures. A case study of subsea operations in the oil industry, found that when formal leaders were inaccessible, individual team members would respond by performing leadership functions without explicit delegation by the formal leader (Johannessen, McArthur, & Jonassen, 2015). Whereas another a case study found that formal and informal leadership structures were put in place both within and between teams to ensure the success of school reform in complex environments, which require cross-sector collaboration and leadership structures that leverage the expertise of the functional groups (Malin & Hackmann, 2019). These studies illustrate the often-complementary relationship between formal and informal leadership.

However, informal leadership processes are not always effective in the context of system goals. For instance, supporting the implementation of a formal leadership team (Davison, Hollenbeck, Barnes, Sleesman, & Ilgen, 2012), Ingvaldsen & Rolfsen, 2012 examined how shared leadership and rotating group spokespersons can be used as alternatives to hierarchical control in autonomous work groups using a qualitative case study of a manufacturing firm. They found that the two alternatives tend to under-perform as they weakened the system's ability to regulate non-routine situations and evaluate integral processes. Their findings underscore the need for further research clarifying why informal leadership emerges, as in some circumstances informal leadership may prove to be detrimental. Another example comes from Newell & Swan, 2000, who conducted a case study of a multi-disciplinary research system. They argued that high levels of trust were necessary to facilitate the levels of communication needed to generate scientific innovation; however, the system experienced a severe distrust, power struggles, a lack of accountability across sites, and a high level of ambiguity for lower-level group members. These findings suggest that even in the presence of formal authority structures, power struggles and informal influence processes might disrupt system functioning.

Three recommendations for advancing integrative research on leadership in interteam contexts

Our review demonstrates that leadership scholars are increasingly answering calls (e.g., Ancona, 1990; Hogg et al., 2012; Pittinsky & Simon, 2007) to adopt an external perspective by examining how team members and leaders reach beyond team boundaries to support team outcomes (e.g., Marrone, 2010; Oh, Chung, & Labianca, 2004; Oh, Labianca, & Chung, 2006) and coordinate with other teams as part of interdependent systems (e.g., Davison, Hollenbeck, Barnes, Sleesman, & Ilgen, 2012; DeChurch et al., 2011; DeChurch & Marks, 2006). Researchers have made great strides in terms of clarifying **what** interaction processes, states, and leadership behaviors comprise 'functional' leadership in interteam contexts, as well as **why** and **where** leadership is enacted. However, our review also revealed that research is far from offering a complete picture of leadership in interteam contexts as studies have progressed within separate siloed literatures that emphasize

leadership processes needed to support team or system objectives, but not both. Further, our review identified critical limits to our current understanding of **when** certain leadership processes are most appropriate and **who** (i.e., which people) should assume responsibility for leadership. Therefore, in the following, we build on these limitations to offer three overarching recommendations for future research that aims to move the field from collecting pieces of a jumbled puzzle to completing a coherent picture of leadership in interdependent organizational systems.

#1 - Clarify how leaders balance 'what' across levels of 'why' and 'where'

The studies we reviewed convincingly demonstrate that leadership processes within and across team boundaries are relevant to the achievement of both team- and system-level collective goals. However, the extant literature hints at the idea that the leadership processes that support team goals might *not* always support system goals, or vice versa. For example, whereas the literature on boundary management emphasizes that leaders enable team success by securing external resources that support team objectives and by protecting the team from outside demands ((Ancona & Caldwell, 1988, 1992, b); Choi, 2002), the literature on multiteam systems has argued that leadership processes need to ensure that all component teams in the system act in pursuit of shared superordinate goals, regardless of whether teams 'win' individually (Lanaj, Hollenbeck, Ilgen, Barnes, & Harmon, 2013). Examining team or system success in isolation makes it challenging for researchers to provide practically relevant guidance for how leadership can support success across *both* collective levels. Thus, our first recommendation is for future research to integrate across research areas in order to better clarify how leaders *balance* the competing demands of interteam contexts. In order to do so, we propose four key advancements.

First, and most obviously, we believe that it is imperative for studies of leadership in interdependent systems to measure and theorize about performance at *multiple* levels of observation. The failure of most studies of cross-boundary processes to examine both team and system outcomes in the same research study is especially problematic given arguments made repeatedly in studies falling within Categories 2, 3, and 4 that what is 'good for the team' and what is 'good for the system' may be at odds with each other. Leaders at all levels in organizations have to navigate inherent tensions which result from multilevel goal hierarchies, multilayered goal and task interdependencies (Kirkman & Harris, 2017), and political and relational dynamics that knit together organizational systems. It is impossible to evaluate empirically how leaders balance these competing demands without evaluating outcomes at multiple collective levels.

Second, we identified many discrepancies across the different categories of research in terms of what leadership processes are emphasized most often. We suggest that developing a comprehensive understanding of how leaders balance the demands of interteam contexts may require more integration of the ideas about 'what leaders do' in these siloed areas of research. For example, in Category 1, researchers emphasize the importance of *task-*, *person-* and *change-oriented* leadership behaviors for team performance (Burke et al., 2006; DeRue et al., 2011; Judge et al., 2004). However, examining the behaviors discussed in Categories 2, 3, and 4, reveals an overwhelming emphasis on *task-oriented* behaviors (e.g., information search/scouting, guarding/sentry, task coordination, strategy development). The lack of attention toward person- and change-oriented behaviors is an important oversight as leveraging person-oriented and change-oriented leadership behaviors might be imperative in intergroup contexts characterized by competing priorities. For example, change-oriented leadership behaviors (e.g., offering an inspiring vision) might allow the leader of one team to reduce his or her own goal conflicts by shifting the goals *others* prioritize to better align with his or her own priorities. Studies of leadership in the context of superordinate goals (Categories 3 and 4) may also benefit

from leveraging more of the nuances of 'boundary management' activities identified in Category 2. For example, although task coordination is heavily emphasized in studies of multiteam systems, other interteam processes that have been shown to support team performance, such as the degree to which teams scout information, represent their work to others, and guard/protect their borders (Ancona & Caldwell, 1992, b) are largely ignored. Again, skill in these more 'politically-oriented' behaviors may be essential to leaders' abilities to navigate the tensions of interteam contexts.

Third, many studies in Categories 2 and 4 suggest that certain cross-boundary processes might have *non-linear* effects for team or system objectives. For example, the literature on boundary spanning emphasizes that team leaders should help their teams strike an appropriate balance of team permeability (Benoliel & Somech, 2015). Likewise, the literature on multiteam systems suggests that although coordination between teams through direct mutual adjustment is often necessary, inefficient patterns of interteam coordination that are not well-matched to task demands can be harmful (Davison, Hollenbeck, Barnes, Sleesman, & Ilgen, 2012; Marks, DeChurch, Mathieu, Panzer, & Alonso, 2005). These previous investigations which have uncovered non-linear effects of 'beneficial' team interteam phenomena point to a need for future research to continue this line of inquiry, particularly in light of mounting evidence that many phenomena exhibit a 'too much of a good thing' effect (Pierce & Aguinis, 2013). We also encourage research to identify specific recommendations for leaders about how to establish the 'optimal' levels of team and interteam states and processes.

Finally, we emphasize that, as researchers, we cannot assume that it is clear *which* goals will take priority. Leadership, in this review, has been functionally defined as meeting the needs of the team and/or the system to enable goal-fulfillment. However, this is the functional ideal— in reality it is less clear which 'needs' leaders will focus on meeting. One specific pathway to understand how leaders may navigate tensions created by conflicting team/team or team/system goals is to consider leaders' accountability. Accountability refers to the "perceived expectation that one's decisions or actions will be evaluated by a salient audience and that rewards or sanctions are believed to be contingent on this expected evaluation" (Hall & Ferris, 2011, p. 134). Notably, rewards and sanctions do not need to be material in nature (e.g., pay or performance evaluations), but rather, can come in the form of implications for one's social reputation (see review by Hall, Frink, & Buckley, 2017).

We expect personal and professional dynamics in many workplaces to produce accountability structures that differ widely from what one might expect based on formal hierarchies or workflow processes. Individuals' are driven to maintain good standing in the eyes of those they deem to be key constituents (Tetlock, 1999), thus, how individuals prioritize team and system goals may be governed by their perceived accountability to different actors or groups in the organization. For example, leaders may need to give an account of their actions to not only superiors, but also peers, and subordinates. Relatedly, a key 'role' of leadership may be to communicate what is important and to whom members are accountable. Organizations might assume certain 'prescribed' objectives are also 'perceived,' but that is not always the case, and leaders (formal and informal) can significantly impact local perceptions of what is important (e.g., within teams). Despite being described as "the adhesive that binds social systems together" (Frink & Klimoski, 1998, p. 3), our review found that discussions of accountability are absent from studies of leadership in interteam contexts.

#2 - Elaborate 'what' in the context of 'when'

Many of the studies we reviewed demonstrated the growing maturity of the leadership field by exploring critical boundary conditions of leadership processes which originate within teams, between teams, and/or in the embedding environment. However, we also identified significant opportunities to advance knowledge about leadership in

interteam contexts by examining additional moderators—particularly with regard to leadership processes spanning team boundaries. Therefore, our second recommendation is to better elaborate 'what' leaders do in the context of 'when.' We highlight a few examples below.

First, like most areas of organizational research, there is an obvious need to better understand how leadership processes within and across teams play out across *time*. We found almost no research in Category 2 investigating how the timing of cross-boundary activities might impact team outcomes. In contrast, research on multiteam systems has begun to consider how interteam leadership processes might need to be matched to the phase of system task performance (DeChurch et al., 2011; DeChurch & Marks, 2006; Lanaj, Hollenbeck, Ilgen, Barnes, & Harmon, 2013). However, across all categories of our framework, we found a preponderance of short-term and cross-sectional studies (see Table 3). It is difficult to make firm recommendations for leaders based on short-term studies of leadership and collaboration given evidence suggesting teams and systems change in meaningful ways over time (Gersick, 1991; Kozlowski et al., 1996). In fact, in one of the few studies of cross-boundary processes across time, Ancona (1990) showed teams that use 'probing' strategies suffered *short term* decrements in team satisfaction but performed the best in the long term.

Notably, cross-sectional designs can also severely undermine the ability to assess causality and *endogeneity* concerns. Briefly, endogeneity concerns exist when the effect of x on y cannot be interpreted because it includes omitted causes and results due to a variety of study design flaws, including omitted variables, omitted selection, simultaneity, common-method variance, and measurement error (for an in-depth review of endogeneity see Antonakis, Bendahan, Jacquart, & Lalive, 2010; Antonakis & House, 2014). Although it appears (see Table 3) that researchers often address one potential source of endogeneity (i.e., by using multi-source data), there are additional recommendations that can help address other sources. First, increased use of appropriate control variables, which Antonakis et al. (2010) defined as "exogenous sources of variance that do not correlate with the error term" (p. 1099), can help address omitted variable bias. Second, increasing the use of experimental or quasi-experimental designs could allow researchers to disentangle causal effects (Stone-Romero, 2008). Further, none of the studies we reviewed utilized *field experiments*. Field experiments have been used in other disciplines, including economics, for a considerable period of time (some would argue since the 1920s; Levitt & List, 2009). Although the use of field experiments is less prevalent in the realm of leadership research (with notable exceptions e.g., Dvir, Eden, Avolio, & Shamir, 2002), there are substantial benefits of using field experiments that could reduce potential concerns regarding causality and endogeneity and might be a fertile ground for testing theory central to leadership in intergroup contexts in a controlled and rigorous way.

Second, although qualitative studies of multiteam systems often emphasize that task demands and system memberships can shift dynamically over time, quantitative studies, especially those conducted in laboratory settings, have tended to model multiteam systems with extremely stable memberships and task demands that operate on relatively short (3–4 h) time frames. Thus, we identified a need for quantitative studies of interdependent systems to consider how leadership processes might support major *changes* in task demands and system memberships. Important questions include: What leadership processes allow high functioning systems to remain so when power dynamics shift as teams that were more central to system task demands become less central? What leadership processes are most effective in dynamic interdependent systems where team membership is highly fluid (i.e., teams are aggregating and disaggregating as a system in response to environmental changes)?

Third, additional research is warranted that evaluates how the *types* of system tasks might determine the most effective patterns of leadership and teamwork processes. Teams and systems tackle a variety of types of tasks ranging from more conceptual (e.g., intellective tasks, decision-making tasks, creativity tasks, cognitive conflict tasks) to more

behavioral (e.g., planning, resolving mixed motives, competitions, psycho-motor tasks; McGrath, 1984). However, whereas the qualitative (e.g., case studies) of multiteam systems we reviewed considered both highly conceptual (e.g., innovation) as well as highly behavioral (e.g., disaster response) system demands, the majority of the quantitative empirical studies we reviewed focused exclusively on behavioral tasks (e.g., military simulations; Davison, Hollenbeck, Barnes, Sleesman, & Ilgen, 2012; DeChurch & Marks, 2006; de Vries, Hollenbeck, Davison, Walter, & Van der Vegt, 2016; Marks, DeChurch, Mathieu, Panzer, & Alonso, 2005; Murase, Carter, DeChurch, & Marks, 2014; Lanaj, Hollenbeck, Ilgen, Barnes, & Harmon, 2013; Firth, Hollenbeck, Miles, Ilgen, & Barnes, 2015; Lanaj, Foulk, & Hollenbeck, 2018; Porck et al., 2019). Interestingly, an overarching conclusion from these studies appears to be that a multiteam system will function best when team identification is strong, teams are rather insular, and interteam coordination processes are handled almost exclusively by a select set of boundary spanners and members of formal leadership teams. However, in the context of creativity tasks, studies from Category 2 have suggested that when teams are overly insular and believe they have a monopoly on a particular domain, they may be unwilling to be influenced by the contributions offered by 'outsiders' and consequently, may suffer creativity decrements (Dokko, Kane, & Tortoriello, 2014; Carbonell & Rodríguez Escudero, 2019). Further, whereas studies of team boundary spanning have suggested that teams engage in *more* boundary activities during times of task uncertainty (Faraj & Yan, 2009), theoretical work on multiteam systems suggests that team members may engage in *less* interteam interaction under situations of high task uncertainty (Luciano et al., 2018). Clearly more research is needed to disentangle these inconsistencies and provide more targeted recommendations for leaders.

Relatedly, we believe that exploring how leadership processes should be matched to the nature of *interteam interdependence* (driven by task demands) is a promising avenue for future research. Pairs of interdependent teams in organizational systems might be engaged in *pooled* (additive), *sequential*, *reciprocal*, and/or *intensive* forms of interdependence at certain points in time (Kennedy, Sommer, & Nguyen, 2017; Marks, DeChurch, Mathieu, Panzer, & Alonso, 2005; Mathieu et al., 2001). These different forms of interteam interdependence may be used as a preliminary guide for structuring leadership processes between teams (e.g., determining 'who' should enact leadership and 'what' processes are most critical) and for helping leaders understand how to prioritize goals (establish 'why' for the team) when they face potential trade-offs across levels of a multiteam goal hierarchy. That is, when teams are pursuing shared goals that require pooled forms of interdependence, they work separately, but may benefit from an *awareness* of what other teams are doing. Under these circumstances, emphasizing *team* level goals is a top priority and external leadership processes (and/or boundary activities) may be kept to a minimum. However, as pairs of teams move toward highly *intensive* forms of interdependence driven by superordinate goals, leadership processes may need to shift toward enhancing collaborative psychological states between teams that support joint problem solving and integration of ideas without also losing sight of team-level goal accomplishment, and may need to involve more (formal and informal) leaders. Unfortunately, only a small subset of the studies we reviewed described the nature of interteam interdependencies in great detail, particularly within Category 2. Thus, in order to build an evidence base related to these propositions, we strongly suggest that future research *specify* the nature of the interteam interdependencies between pairs of teams when examining team and leadership processes.

#3 - Evaluate 'who' should (or is likely to) enact 'what' 'where'

Quantitative studies of leadership within teams in support of team goals (Category 1) are finding that informal leadership (provided by members of the group) is important and often, augments formal

leadership to improve team effectiveness (e.g., Aime et al., 2014; Carson, Tesluk, & Marrone, 2007; D'Innocenzo et al., 2016; Klein et al., 2006; Nicolaides et al., 2014; Wang et al., 2014). However, across the other three categories of research, we found a paucity of quantitative investigations of informal leadership. This is unfortunate because qualitative case studies across all three areas have often found that informal leadership processes do, in fact, exist in interteam contexts (Bienefeld & Grote, 2014; Johannessen, McArthur, & Jonassen, 2015; Malin & Hackmann, 2019), and may not always support team or system objectives (Ingvaldsen & Rolfsen, 2012). Therefore, our third recommendation is for future research to more carefully evaluate the *antecedents* and *outcomes* of informal leadership influence in interteam contexts.

For example, in the context of studies within Category 2, researchers have depicted cross-boundary processes as functions that formal leaders might enact and additionally, as functions that can be distributed among multiple team members (Marrone, Tesluk, & Carson, 2007). However, the studies we reviewed typically measured the overall 'amount' of team boundary spanning without considering *which* team members are enacting those processes (Ancona et al., 2002; Elkins & Keller, 2003; Ferguson & Blackman, 2019). The few exceptions to this trend suggest that there are meaningful effects when the *patterning* of team members' boundary spanning behavior is taken into account (Büchel, Nieminen, Armbruster-Domeyer, & Denison, 2013; Oh, Chung, & Labianca, 2004). Given the complex, multifaceted nature of most modern workplaces, targeted, purposeful, and coordinated patterns of boundary spanning efforts are likely to yield more positive results than unstructured activities, left solely to chance. Leadership in interteam contexts should work to ensure that the right people within the team are connecting with the right *other* people external to the team and that the cross-boundary actions of team members are not unnecessarily duplicated or working at cross-purposes. Research is needed to provide more targeted guidance about how teams can best distribute responsibility for cross-boundary processes to support collective goals.

The vast majority of quantitative studies in Categories 3 and 4 have investigated leadership influence *after* a formal leadership team has been established. There are certainly numerous benefits to having a formal leadership team that is devoted to achieving the shared superordinate goal of the system and is focused exclusively on managing all interteam coordination demands (Davison, Hollenbeck, Barnes, Sleesman, & Ilgen, 2012; DeChurch & Marks, 2006; Firth, Hollenbeck, Miles, Ilgen, & Barnes, 2015). Unfortunately, not all systems contain a formal leadership team, at least not during the initial stages of system performance. Moreover, even when formal leadership teams are established, there may be power dynamics at play and disagreements about which goals should be prioritized (Newell & Swan, 2000). Indeed, Lanaj, Foulk, & Hollenbeck, 2018 findings that formal leadership teams and lower level component teams can hold (and express) different preferences for risk taking hint at the possibility that 'leadership' influence can emanate from formal as well as informal sources.

Therefore, we strongly suggest that future research should seek to better understand *why* informal leadership influence processes arise within and across teams—particularly in the context of interdependent teams whose joint efforts *could* be used to achieve important societal or organizational goals. Doing so could help illuminate whether the patterns of leadership influence that are associated with high levels of system performance under certain circumstances are also the patterns that are *likely* to arise. Moreover, should researchers find that the patterns of leadership that are likely to emerge are *not* the patterns of leadership that are most effective, understanding the antecedents of these social systems could help point toward organizational interventions.

For example, the design of organizational structures and workflows as well as decisions regarding goals, reward systems, and personnel (e.g., new hires or inter-unit transfers) are often not made with the explicit purpose of influencing how employees interact with each other;

nevertheless, these decisions by formal leaders shape how networks of relationships (including informal leadership) develop in the workplace (Antonakis & House, 2014; Brass, 2001; Brass & Krackhardt, 1999). These decisions "fundamentally alter the internal social structure of organizations by fluctuating the pool of human capital (i.e., composition), altering employee interaction patterns (i.e., configuration), and changing the nature of employee relationships (i.e., content)" (Methot, Rosado-Solomon, & Allen, 2018; p. 726). Thus, formal leaders should include in their calculus how decisions regarding personnel assignments, work design, goals, and performance evaluations might shape the development of relationships among employees that impact the achievement of collective goals (Cullen-Lester, Maupin, & Carter, 2017).

Notably, simply *prescribing* patterns of cross-boundary activities needed to achieve team and system goals may not be sufficient and could even be detrimental (e.g., employees may respond negatively if they feel the organization is trying to control or prescribe whom they should talk to, develop friendships with, or try to influence). Thus, we argue that leaders would be better served to focus on understanding how they can set up the 'facilitating conditions' (Hackman, 2012) that support the emergence of beneficial networks of informal influence in interdependent systems (i.e., conditions that allow groups to chart their own course in support of both team and system goals) as opposed to attempting to prescribe formalized structures in their entirety. For instance, research suggests that actions of formal leaders' signal whether it is advisable for members of their team to form cross-boundary relationships. Leaders encourage cooperation or, conversely, competition with their rhetoric and the goals and structures they emphasize (Kaiser, Hogan, & Craig, 2008). For example, leaders who emphasize intra-organizational comparisons may improve performance for their team by increasing motivation, but this decision may also evoke feelings of rivalry with others (Kilduff, 2014; Kilduff, Elfenbein, & Staw, 2010) and lead to destructive competitive emotions (e.g., envy; Nickerson & Zenger, 2008) and behaviors (e.g., dishonesty; Charness, Masclet, & Villeval, 2013; Chan, Li, & Pierce, 2014; excessive risk taking; Kacperczyk, Beckman, & Moliterno, 2015).

Future research might also draw inspiration from the fields of economics (e.g., retirement savings), healthcare (e.g., exercise or food choices), and marketing (e.g., product purchases) to learn how leaders might 'nudge' employees toward making decisions that will help their team and the broader organizational system in which the team is embedded when developing, maintaining, and altering their workplace relationships. Recently, Tawse, Patrick, and Vera (2019) proposed that nudges (i.e., "any aspect of the choice architecture that alters people's behavior in a predictable way", Thaler & Sunstein, 2008, p. 6) might be used to encourage strategic leaders to shift their attention from planning activities to the hard work of strategy implementation. They proposed that nudges may be used to create an implementation mindset by removing planning distractions and using verbal framing to strengthen managers' willpower. Future research might focus on identifying nudges that leaders might use to encourage desirable cross-boundary behaviors. Although the aim is not to 'prescribe' the development of specific relationships, formal leaders still need to have a clear picture of what types and patterns of cross-boundary connections are needed in order to achieve collective goals across levels so that they might create conditions that encourage employees to form these relationships themselves.

Conclusion

Enacting leadership in interteam contexts is often a balancing act and a moving target—and so is the *study* of leadership in interteam contexts. We applaud previous researchers who have taken on the immensely complex challenge of delineating the nature of 'functional' leadership in interteam contexts. We hope this review serves as a foundation for future research that connects ideas and perspectives

across disparate areas of inquiry in order to further clarify how formal and informal leaders and leadership processes within and across teams support organizational objectives across team and system levels.

References

Aime, F., Humphrey, S., DeRue, D. S., & Paul, J. B. (2014). The riddle of heterarchy: Power transitions in cross-functional teams. *Academy of Management Journal, 57*(2), 327–352.

Alter, C. (1990). An exploratory study of conflict and coordination in interorganizational service delivery system. *Academy of Management Journal, 33*(3), 478–502.

Ancona, D., Bresman, H., & Kaeufer, K. (2002). The comparative advantage of X-teams. *MIT Sloan Management Review, 43*(3), 33–39.

Ancona, D. G. (1990). Outward bound: Strategic for team survival in an organization. *Academy of Management Journal, 33*(2), 334–365.

Ancona, D. G. (1993). The classics and the contemporary: A new blend of small group theory. In J. K. Murnighan (Ed.). *Social psychology in organizations: Advances in theory and research* (pp. 225–243). Englewood Cliffs, NJ: Prentice Hall.

Ancona, D. G., & Caldwell, D. F. (1988). Beyond task and maintenance: Defining external functions in groups. *Group & Organization Studies, 13*(4), 468–494.

Ancona, D. G., & Caldwell, D. (1990). Beyond boundary spanning: Managing external dependence in product development teams. *The Journal of High Technology Management Research, 1*(2), 119–135.

Ancona, D. G., & Caldwell, D. F. (1992a). Demography and design: Predictors of new product team performance. *Organization Science, 3*(3), 321–341.

Ancona, D. G., & Caldwell, D. F. (1992b). Bridging the boundary: External activity and performance in organizational teams. *Administrative Science Quarterly, 37*(4), 634–655.

Ancona, D. G., & Caldwell, D. F. (1998). Rethinking team composition from the outside in. In D. H. Gruenfeld (Ed.). *Research on managing groups and teams* (pp. 21–37). Stamford CT: Elsevier Science/JAI Press.

Anderson, P. H., & Kragh, H. (2015). Exploring boundary-spanning practices among creativity managers. *Management Decision, 53*(4), 786–808.

Antonakis, J., Bendahan, S., Jacquart, P., & Lalive, R. (2010). On making causal claims: A review and recommendations. *The Leadership Quarterly, 21*(6), 1086–1120.

Antonakis, J., & House, R. J. (2014). Instrumental leadership: Measurement and extension of transformational–transactional leadership theory. *The Leadership Quarterly, 25*(4), 746–771.

Arnett, D. B., & Wittmann, C. M. (2014). Improving marketing success: The role of tacit knowledge exchange between sales and marketing. *Journal of Business Research, 67*(3), 324–331.

Arrow, H., McGrath, J. E., & Berdahl, J. L. (2000). *Small groups as complex systems.* Thousand Oaks, CA: Sage Publications.

Aubé, C., & Rousseau, V. (2005). Team goal commitment and team effectiveness: The role of task interdependence and supportive behaviors. *Group Dynamics: Theory, Research, and Practice, 9*(3), 189–204.

Balkundi, P., & Harrison, D. A. (2006). Ties, leaders, and time in teams: Strong inference about network structure's effects on team viability and performance. *Academy of Management Journal, 49*(1), 49–68.

Banks, G. C., McCauley, K. D., Gardner, W. L., & Guler, C. E. (2016). A meta-analytic review of authentic and transformational leadership: A test for redundancy. *The Leadership Quarterly, 27*(4), 634–652.

Bass, B. M. (1985). *Leadership and performance beyond expectations.* New York: Free Press.

Bass, B. M. (1990). From transactional to transformational leadership: Learning to share the vision. *Organizational Dynamics, 18*(3), 19–31.

Bass, B. M., & Avolio, B. J. (1993). Transformational leadership: A response to critiques. In M. M. Chemers, & R. Ayman (Eds.). *Leadership theory and research: Perspectives and directions* (pp. 49–80). San Diego, CA, US: Academic Press.

Bass, B. M., & Avolio, B. J. (Eds.). (1994). *Improving organizational effectiveness through transformational leadership.* Thousand Oaks, CA, US: Sage Publications, Inc.

Bearman, C., Paletz, S. B., Orasanu, J., & Thomas, M. J. (2010). The breakdown of coordinated decision making in distributed systems. *Human Factors, 52*(2), 173–188.

Beck, T. E., & Plowman, D. A. (2013). Temporary, emergent interorganizational collaboration in unexpected circumstances: A study of the Columbia space shuttle response effort. *Organization Science, 25*(4), 1234–1252.

Benoliel, P., & Somech, A. (2015). The role of leader boundary activities in enhancing interdisciplinary team effectiveness. *Small Group Research, 46*(1), 83–124.

Bick, S., Spohrer, K., Hoda, R., Scheerer, A., & Heinzl, A. (2018). Coordination challenges in large-scale software development: A case study of planning misalignment in hybrid settings. *IEEE Transactions on Software Engineering, 44*(10), 932–950.

Bienefeld, N., & Grote, G. (2014). Speaking up in ad hoc multiteam systems: Individual-level effects of psychological safety, status, and leadership within and across teams. *European Journal of Work and Organizational Psychology, 23*(6), 930–945.

Bienefeld, N., & Grote, G. (2014). Shared leadership in multiteam systems: How cockpit and cabin crews lead each other to safety. *Human Factors, 56*(2), 270–286.

Birkinshaw, J., Ambos, T. C., & Bouquet, C. (2017). Boundary spanning activities of corporate HQ executives insights from a longitudinal study. *Journal of Management Studies, 54*(4), 422–454.

Blake, R. R., Shepard, H. A., & Mouton, J. S. (1964). *Managing intergroup conflict in industry.* Houston, TX: Gulf Publishing Company.

Brass, D. J. (2001). Social capital and organizational leadership. In S. J. Zaccaro, & R. J. Klimoski (Eds.). *The nature of organizational leadership* (pp. 132–152). San Francisco, CA: Jossey-Bass.

Brass, D. J., & Krackhardt, D. (1999). The social capital of 21st century leaders. In J. G.

Hunt, & R. L. Phillips (Eds.). *Out-of-the-box leadership* (pp. 179–194). Stamford, CT: JAI Press.

Zolper, K., Beimborn, D., & Weitzel, T. (2013). When the river leaves its bed: Analyzing deviations between planned and actual interaction structures in IT change processes. *Journal of Information Technology, 28*(4), 333–353.

Brett, J.M., & Rognes, J.K. (1986). Intergroup relations in organizations. In P.S. Goodman & Associates (Eds.), Designing effective work groups (pp. 202–236). San Francisco, CA: Jossey-Bass.

Brion, S., Chauvet, V., Chollet, B., & Mothe, C. (2012). Project leaders as boundary spanners: Relational antecedents and performance outcomes. *International Journal of Project Management, 30*(6), 708–722.

Büchel, B., Nieminen, L., Armbruster-Domeyer, H., & Denison, D. (2013). Managing stakeholders in team-based innovation: The dynamics of knowledge and trust networks. *European Journal of Innovation Management, 16*(1), 22–49.

Bullinger, A. C., Neyer, A. K., Rass, M., & Moeslein, K. M. (2010). Community-based innovation contests: Where competition meets cooperation. *Creativity and Innovation Management, 19*(3), 290–303.

Burke, C. S., Stagl, K. C., Klein, C., Goodwin, G. F., Salas, E., & Halpin, S. M. (2006). What type of leadership behaviors are functional in teams? A meta-analysis. *The Leadership Quarterly, 17*(3), 288–307.

Burt, R. S. (1992). *Structural holes. The social structure of competition.* Cambridge, MA: Harvard University Press.

Carbonell, P., & Rodríguez Escudero, A. I. (2019). The dark side of team social cohesion in NPD team boundary spanning. *Journal of Product Innovation Management, 36*(2), 149–171.

Carson, J. B., Tesluk, P. E., & Marrone, J. A. (2007). Shared leadership in teams: An investigation of antecedent conditions and performance. *Academy of Management Journal, 50*(5), 1217–1234.

Carter, D. R., & DeChurch, L. A. (2014). Leadership in multiteam systems: A network perspective. In D. Day (Ed.). *The Oxford handbook of leadership* (pp. 483–505). New York, NY: Oxford University Press.

Carter, D. R., DeChurch, L. A., Braun, M., & Contractor, N. (2015). Social network approaches to leadership: An integrative conceptual review. *Journal of Applied Psychology, 100*(3), 597–622.

Cha, J., Kim, Y., Lee, J. Y., & Bachrach, D. G. (2015). Transformational leadership and inter-team collaboration: Exploring the mediating role of teamwork quality and moderating role of team size. *Group & Organization Management, 40*(6), 715–743.

Chan, C. C., Pearson, C., & Entrekin, L. (2003). Examining the effects of internal and external team learning on team performance. *Team Performance Management, 9*(7/8), 174–181.

Chan, T. Y., Li, J., & Pierce, L. (2014). Compensation and peer effects in competing sales teams. *Management Science, 60*(8), 1965–1984.

Charness, G., Masclet, D., & Villeval, M. C. (2013). The dark side of competition for status. *Management Science, 60*(1), 38–55.

Chen, M. H., & Wang, M. C. (2008). Social networks and a new venture's innovative capability: The role of trust within entrepreneurial teams. *R&D Management, 38*(3), 253–264.

Choi, J. N. (2002). External activities and team effectiveness: Review and theoretical development. *Small Group Research, 33*(2), 181–208.

Chuang, C. H., Jackson, S. E., & Jiang, Y. (2016). Can knowledge-intensive teamwork be managed? Examining the roles of HRM systems, leadership, and tacit knowledge. *Journal of Management, 42*(2), 524–554.

Chung, Y., & Jackson, S. E. (2013). The internal and external networks of knowledge-intensive teams: The role of task routineness. *Journal of Management, 39*(2), 442–468.

Connaughton, S. L., Williams, E. A., & Shuffler, M. L. (2012). Social identity issues in multiteam systems: Considerations for future research. In S. J. Zaccaro, M. A. Marks, & L. A. DeChurch (Eds.). *Multiteam systems: An organization form for dynamic and complex environments* (pp. 109–140). New York, NY: Routledge Taylor & Francis Group.

Contractor, N. S., DeChurch, L. A., Carson, J., Carter, D. R., & Keegan, B. (2012). The topology of collective leadership. *The Leadership Quarterly, 23*(6), 994–1011.

Corsaro, D., Ramos, C., Henneberg, S. C., & Naudé, P. (2012). The impact of network configurations on value constellations in business markets—The case of an innovation network. *Industrial Marketing Management, 41*(1), 54–67.

Cross, R., Rebele, R., & Grant, A. (2016). Collaborative overload. *Harvard Business Review, 94*(1), 74–79.

Cuijpers, M., Uitdewilligen, S., & Guenter, H. (2016). Effects of dual identification and interteam conflict on multiteam system performance. *Journal of Occupational and Organizational Psychology, 89*(1), 141–171.

Cullen-Lester, K. L., Maupin, C. K., & Carter, D. R. (2017). Incorporating social networks into leadership development: A conceptual model and evaluation of research and practice. *The Leadership Quarterly, 28*(1), 130–152.

Cullen-Lester, K. L., & Yammarino, Y. J. (2016). Collective and network approaches to leadership: Special issue introduction. *The Leadership Quarterly, 27*(2), 173–180.

Cummings, J. N., & Kiesler, S. (2005). Collaborative research across disciplinary and organizational boundaries. *Social Studies of Science, 35*(5), 703–722.

Curnin, S., Owen, C., & Trist, C. (2014). Managing the constraints of boundary spanning in emergency management. *Cognition, Technology & Work, 16*(4), 549–563.

Dahl, M. S., & Pedersen, C. (2005). Social networks in the R&D process: The case of the wireless communication industry around Aalborg, Denmark. *Journal of Engineering and Technology Management, 22*(1–2), 75–92.

Dansereau, F., Graen, G., & Haga, W. J. (1975). A vertical dyad linkage approach to leadership within formal organizations: A longitudinal investigation of the role making process. *Organizational Behavior and Human Performance, 13*(1), 46–78.

Davison, R. B., Hollenbeck, J. R., Barnes, C. M., Sleesman, D. J., & Ilgen, D. R. (2012). Coordinated action in multiteam systems. *Journal of Applied Psychology, 97*(4),

808–824.

Day, D. V., Gronn, P., & Salas, E. (2004). Leadership capacity in teams. *The Leadership Quarterly, 15*(6), 857–880.

de Vries, T. A., Hollenbeck, J. R., Davison, R. B., Walter, F., & Van der Vegt, G. S. (2016). Managing coordination in multiteam systems: Integrating micro and macro perspectives. *Academy of Management Journal, 59*(5), 1823–1844.

de Vries, T. A., Walter, F., Van der Vegt, G. S., & Essens, P. J. (2014). Antecedents of individuals' interteam coordination: Broad functional experiences as a mixed blessing. *Academy of Management Journal, 57*(5), 1334–1359.

DeChurch, L. A., Burke, C. S., Shuffler, M. L., Lyons, R., Doty, D., & Salas, E. (2011). A historiometric analysis of leadership in mission critical multiteam environments. *The Leadership Quarterly, 22*(1), 152–169.

DeChurch, L. A., & Marks, M. A. (2006). Leadership in multiteam systems. *Journal of Applied Psychology, 91*(2), 311.

DeRue, D. S., & Ashford, S. J. (2010). Who will lead and who will follow? A social process of leadership identity construction in organizations. *Academy of Management Review, 35*(4), 627–647.

Derue, D. S., Nahrgang, J., Wellman, N., & Humphrey, S. E. (2011). Trait and behavioral theories of leadership: An integration and meta-analytic test of their relative validity. *Personnel Psychology, 64*(1), 7–52.

DiazGranados, D., Dow, A. W., Perry, S. J., & Palesis, J. A. (2014). Understanding patient care as a multiteam system. *Pushing the boundaries: Multiteam systems in research and practice* (pp. 95–113). Houston, TX: Emerald Group Publishing Limited.

Dinh, J. E., Lord, R. G., Gardner, W. L., Meuser, J. D., Liden, R. C., & Hu, J. (2014). Leadership theory and research in the new millennium: Current theoretical trends and changing perspectives. *The Leadership Quarterly, 25*(1), 36–62.

D'Innocenzo, L., Mathieu, J. E., & Kukenberger, M. R. (2016). A meta-analysis of different forms of shared leadership–team performance relations. *Journal of Management, 42*(7), 1964–1991.

Dokko, G., Kane, A. A., & Tortoriello, M. (2014). One of us or one of my friends: How social identity and tie strength shape the creative generativity of boundary-spanning ties. *Organization Studies, 35*(5), 703–726.

Drach-Zahavy, A. (2011). Interorganizational teams as boundary spanners: The role of team diversity, boundedness, and extrateam links. *European Journal of Work and Organizational Psychology, 20*(1), 89–118.

Dvir, T., Eden, D., Avolio, B. J., & Shamir, B. (2002). Impact of transformational leadership on follower development and performance: A field experiment. *Academy of Management Journal, 45*(4), 735–744.

Edmondson, A. C. (1999). Psychological safety and learning behavior in work teams. *Administrative Science Quarterly, 44*(2), 350–383.

Edmondson, A. C. (2003). Speaking up in the operating room: How team leaders promote learning in interdisciplinary action teams. *Journal of Management Studies, 40*(6), 1419–1452.

Elkins, T., & Keller, R. T. (2003). Leadership in research and development organizations: A literature review and conceptual framework. *The Leadership Quarterly, 14*(4/5), 587–606.

Ernst, C., & Chrobot-Mason, D. (2011a). *Boundary spanning leadership.* New York, NY: McGraw-Hill.

Ernst, C., & Chrobot-Mason, D. (2011b). Flat world, hard boundaries: How to lead across them. *MIT Sloan Management Review, 52*(3), 81–88.

Faraj, S., & Yan, A. (2009). Boundary work in knowledge teams. *Journal of Applied Psychology, 94*(3), 604–617.

Farh, C. I., & Chen, G. (2018). Leadership and member voice in action teams: Test of a dynamic phase model. *Journal of Applied Psychology, 103*(1), 97–110.

Ferguson, A. J., Ormiston, M. E., & Wong, E. M. (2019). The effects of cohesion and structural position on the top management team boundary spanning–firm performance relationship. *Group & Organization Management, 44*(6), 1099–1135.

Ferguson, S., & Blackman, D. (2019). Translating innovative practices into organizational knowledge in the public sector: A case study. *Journal of Management & Organization, 25*(1), 42–57.

Fiedler, F. E. (1967). *A theory of leadership effectiveness.* New York: McGraw-Hill.

Firth, B. M., Hollenbeck, J. R., Miles, J. E., Ilgen, D. R., & Barnes, C. M. (2015). Same page, different books: Extending representational gaps theory to enhance performance in multiteam systems. *Academy of Management Journal, 58*(3), 813–835.

Fleishman, E. A., Mumford, M. D., Zaccaro, S. J., Levin, K. Y., Korotkin, A. L., & Hein, M. B. (1991). Taxonomic efforts in the description of leader behavior: A synthesis and functional interpretation. *The Leadership Quarterly, 2*(4), 245–287.

Fleştea, A. M., Curşeu, P. L., & Fodor, O. C. (2017). The bittersweet effect of power disparity: Implications for emergent states in collaborative multi-party systems. *Journal of Managerial Psychology, 32*(5), 401–416.

Floyd, S. W., & Wooldridge, B. (1997). Middle management's strategic influence and organizational performance. *Journal of Management Studies, 34*(3), 465–485.

Follett, M. P. (1924). *Creative experience.* New York, NY: Longmans, Green.

Foss, K., & Rodgers, W. (2011). Enhancing information usefulness by line managers' involvement in cross-unit activities. *Organization Studies, 32*(5), 683–703.

Friedman, R. A., & Podolny, J. (1992). Differentiation of boundary spanning roles: Labor negotiations and implications for role conflict. *Administrative Science Quarterly, 37*(1), 28–47.

Frink, D. D., & Klimoski, R. J. (1998). Toward a theory of accountability in organizations and human resources management. In G. R. Ferris (Vol. Ed.), *Research in personnel and human resources management. Vol. 16. Research in personnel and human resources management* (pp. 1–51). Greenwich, CT: JAI Press.

Gardner, W. R., Harris, T. B., Li, N., Kirkman, B. L., & Mathieu, J. E. (2017). Understanding "it depends" in organizational research: A theory-based taxonomy, review, and future research agenda concerning interactive and quadratic relationships. *Organizational Research Methods, 20*(4), 610–638.

Garvin, D. A., Edmondson, A. C., & Gino, F. (2008). Is yours a learning organization. *Harvard Business Review, 86*(3), 109.

Gasson, S. (2005). The dynamics of sensemaking, knowledge and expertise in collaborative, boundary-spanning design. *Journal of Computer-Mediated Communication, 10*, 23–34.

Gerber, D. E., Reimer, T., Williams, E. L., Gill, M., Loudat Priddy, L., Bergestuen, D., ... Craddock Lee, S. J (2016). Resolving rivalries and realigning goals: Challenges of clinical and research multiteam systems. *Journal of Oncology Practice, 12*(11), 1020–1028.

Gersick, C. J. G. (1991). Revolutionary change theories: A multilevel exploration of the punctuated equilibrium paradigm. *Academy of Management Review, 16*(1), 10–36.

Gil, F., Alcover, C. M., Peiró, J. M., Rico, R., Alcover, C. M., & Barrasa, Á. (2005). Change-oriented leadership, satisfaction and performance in work groups. *Journal of Managerial Psychology, 20*, 312–328.

Glaser, L., Fourné, S. P., & Elfring, T. (2015). Achieving strategic renewal: The multi-level influences of top and middle managers' boundary-spanning. *Small Business Economics, 45*(2), 305–327.

Gleibs, I. H., & Haslam, S. A. (2016). Do we want a fighter? The influence of group status and the stability of intergroup relations on leader prototypicality and endorsement. *The Leadership Quarterly, 27*(4), 557–573.

Glynn, M. A., Kazanjian, R., & Drazin, R. (2010). Fostering innovation in complex product development settings: The role of team member identity and interteam interdependence. *Journal of Product Innovation Management, 27*(7), 1082–1095.

Graen, G. B. (1976). Role-making processes within complex organizations. In M. D. Dunnette (Ed.). *Handbook of industrial and organizational psychology* (pp. 1201–1245). Chicago, IL: Rand McNally.

Graen, G. B., & Cashman, J. F. (1975). A role-making model of leadership in formal organisations: A developmental approach. In J. G. Hunt, & L. L. Larson (Eds.). *Leadership frontiers* (pp. 143–165). Kent, OH: Kent State University Press.

Graen, G. B., & Uhl-Bien, M. (1995). Relationship-based approach to leadership: Development of Leader-Member-Exchange (LMX) Theory of leadership over 25 years: Applying a multi-level multi-domain perspective. *The Leadership Quarterly, 6*(2), 219–247.

Gray, S. M., Bunderson, J. S., Boumgarden, P., & Bechara, J. P. (2019). Engineering interaction: Structural change, locus of identification, and the formation and maintenance of cross-unit ties. *Personnel Psychology, 72*, 599–622.

Greenleaf, R. K. (1970). *The servant as leader.* Newton Centre, MA: The Robert K. Greenleaf Center.

Greenleaf, R. K. (1977). *Servant leadership: A journey into the nature of legitimate power and greatness.* New York, NY: Paulist Press.

Grippa, F., Bucuvalas, J., Booth, A., Alessandrini, E., Fronzetti Colladon, A., & Wade, L. M. (2018). Measuring information exchange and brokerage capacity of healthcare teams. *Management Decision, 56*(10), 2239–2251.

Hackman, J., & Walton, R. (1986). Leading groups in organizations. In P. Goodman (Ed.). *Designing effective work groups* (pp. 72–117). San Francisco, CA: Jossey- Bass.

Gumusluoglu, L., Karakitapoğlu-Aygün, Z., & Scandura, T. A. (2017). A multilevel examination of benevolent leadership and innovative behavior in R&D contexts: A social identity approach. *Journal of Leadership & Organizational Studies, 24*(4), 479–493.

Hackman, J. R. (2012). From causes to conditions in group research. *Journal of Organizational Behavior, 33*, 428–444.

Hackman, J. R., & Morris, C. G. (1975). Group tasks, group interaction process, and group performance effectiveness: A review and proposed integration. *Advances in Experimental Social Psychology, 8*, 45–99.

Hall, A. T., & Ferris, G. R. (2011). Accountability and extra-role behavior. *Employee Responsibilities and Rights Journal, 23*(2), 131–144.

Hall, A. T., Frink, D. D., & Buckley, M. R. (2017). An accountability account: A review and synthesis of the theoretical and empirical research on felt accountability. *Journal of Organizational Behavior, 38*(2), 204–224.

Henttonen, K., Johanson, J. E., & Janhonen, M. (2014). Work-team bonding and bridging social networks, team identity and performance effectiveness. *Personnel Review, 43*(3), 330–349.

Hewstone, M. E., & Brown, R. E. (1986). *Contact and conflict in intergroup encounters.* Oxford, UK: Basil Blackwell.

Hirst, G., & Mann, L. (2004). A model of R&D leadership and team communication: The relationship with project performance. *R&D Management, 34*(2), 147–160.

Hoegl, M., & Weinkauf, K. (2005). Managing task interdependencies in multi-team projects: A longitudinal study. *Journal of Management Studies, 42*(6), 1287–1308.

Hoegl, M., Weinkauf, K., & Gemuenden, H. G. (2014). Interteam coordination, project commitment, and teamwork in multiteam R&D projects: A longitudinal study. *Organization Science, 15*(1), 38–55.

Hogg, M. A., Van Knippenberg, D., & Rast, D. E. (2012). Intergroup leadership in organizations: Leading across group and organizational boundaries. *Academy of Management Review, 37*(2), 232–255.

Hollander, E. P., & Julian, J. W. (1969). Contemporary trends in the analysis of leadership processes. *Psychological Bulletin, 71*, 387–397.

House, R. J. (1971). A path goal theory of leader effectiveness. *Administrative Science Quarterly, 16*(3), 321–339.

House, R. J. (1977). A 1976 theory of charismatic leadership. In J. G. Hunt, & L. L. Larson (Eds.). *Leadership: The cutting edge.* Carbondale, IL: Southern Illinois University Press.

Hu, J., & Judge, T. A. (2017). Leader–team complementarity: Exploring the interactive effects of leader personality traits and team power distance values on team processes and performance. *Journal of Applied Psychology, 102*(6), 935–955.

Hurt, K. J. (2016). A theoretical model of training and its transference: The pivotal role of top management team composition and characteristics. *Human Resource Development International, 19*(1), 44–66.

Ingvaldsen, J. A., & Rolfsen, M. (2012). Autonomous work groups and the challenge of inter-group coordination. *Human Relations, 65*(7), 861–881.

Janis, I. L. (1971). Groupthink. *Psychology Today, 5*(6), 43–46.

Johannessen, I. A., McArthur, P. W., & Jonassen, J. R. (2015). Informal leadership redundancy: Balancing structure and flexibility in subsea operations. *Scandinavian Journal of Management, 31*(3), 409–423.

Joshi, A., Pandey, N., & Han, G. (2009). Bracketing team boundary spanning: An examination of task-based, team-level, and contextual antecedents. *Journal of Organizational Behavior, 30*(6), 731–759.

Journal Citation Reports (2018). *Clarivate analytics.*

Judge, T. A., Piccolo, R. F., & Ilies, R. (2004). The forgotten ones? The validity of consideration and initiating structure in leadership research. *Journal of Applied Psychology, 89*(1), 36–51.

Jung, D., Yammarino, F. J., & Lee, J. K. (2009). Moderating role of subordinates' attitudes on transformational leadership and effectiveness: A multi-cultural and multi-level perspective. *The Leadership Quarterly, 20*(4), 586–603.

Kacperczyk, A., Beckman, C. M., & Moliterno, T. P. (2015). Disentangling risk and change: Internal and external social comparison in the mutual fund industry. *Administrative Science Quarterly, 60*(2), 228–262.

Kaiser, R. B., Hogan, R., & Craig, S. B. (2008). Leadership and the fate of organizations. *American Psychologist, 63*(2), 96–110.

Katz, D., Maccoby, N., Gurin, G., & Floor, L. G. (1951). *Productivity, supervision and morale among railroad workers.* Oxford, England: Survey Research Center.

Katz, R., & Allen, T. J. (1982). Investigating the not invented here (NIH) syndrome: A look at the performance, tenure, and communication patterns of 50 R & D project groups. *R&D Management, 12*(1), 7–20.

Keller, R. T. (2001). Cross-functional project groups in research and new product development: Diversity, communications, job stress, and outcomes. *Academy of Management Journal, 44*(3), 547–555.

Kellogg, K. C., Orlikowski, W. J., & Yates, J. (2006). Life in the trading zone: Structuring coordination across boundaries in post-bureaucratic organizations. *Organization Science, 17*(1), 22–44.

Kennedy, D. M., Sommer, S. A., & Nguyen, P. A. (2017). Optimizing multi-team system behaviors: Insights from modeling team communication. *European Journal of Operational Research, 258*(1), 264–278.

Kilduff, G. J. (2014). Driven to win: Rivalry, motivation, and performance. *Social Psychological and Personality Science, 5*(8), 944–952.

Kilduff, G. J., Elfenbein, H. A., & Staw, B. M. (2010). The psychology of rivalry: A relationally dependent analysis of competition. *Academy of Management Journal, 53*(5), 943–969.

Kirkman, B. L., & Harris, T. B. (2017). *3D team leadership: A new approach for complex teams.* Stanford University Press.

Klein, K. J., Ziegert, J. C., Knight, A. P., & Xiao, Y. (2006). Dynamic delegation: Shared, hierarchical, and deindividualized leadership in extreme action teams. *Administrative Science Quarterly, 51*(4), 590–621.

Knipfer, K., Schreiner, E., Schmid, E., & Peus, C. (2018). The performance of pre-founding entrepreneurial teams: The importance of learning and leadership. *Applied Psychology, 67*(3), 401–427.

Kozlowski, S. W., Gully, S. M., McHugh, P. P., Salas, E., & Cannon-Bowers, J. A. (1996). A dynamic theory of leadership and team effectiveness: Developmental and task contingent leader roles. *Research in Personnel and Human Resources Management, 14*, 253–306.

Kozlowski, S. W., Mak, S., & Chao, G. T. (2016). Team-centric leadership: An integrative review. *Annual Review of Organizational Psychology and Organizational Behavior, 3*, 21–54.

Kozlowski, S. W. J., & Ilgen, D. R. (2006). Enhancing the effectiveness of work groups and teams. *Psychological Science in the Public Interest, 7*(3), 77–124.

Kozlowski, S. W. J., & Klein, K. J. (2000). A multilevel approach to theory and research in organizations: Contextual, temporal, and emergent processes. In K. J. Klein, & S. W. J. Kozlowski (Eds.). *Multilevel theory, research, and methods in organizations: Foundations, extensions, and new directions* (pp. 3–90). San Francisco, CA, US: Jossey-Bass.

Kratzer, J., Gemünden, H. G., & Lettl, C. (2008). Balancing creativity and time efficiency in multi-team R&D projects: The alignment of formal and informal networks. *R&D Management, 38*(5), 538–549.

Lanaj, K., Foulk, T. A., & Hollenbeck, J. R. (2018). The benefits of not seeing eye to eye with leadership: Divergence in risk preferences impacts multiteam system behavior and performance. *Academy of Management Journal, 61*(4), 1554–1582.

Lanaj, K., Hollenbeck, J. R., Ilgen, D. R., Barnes, C. M., & Harmon, S. J. (2013). The double-edged sword of decentralized planning in multiteam systems. *Academy of Management Journal, 56*(3), 735–757.

Lee, S., & Sawang, S. (2016). Unpacking the impact of attachment to project teams on boundary-spanning behaviors. *International Journal of Project Management, 34*(3), 444–451.

Levitt, S. D., & List, J. A. (2009). Field experiments in economics: The past, the present, and the future. *European Economic Review, 53*(1), 1–18.

Liden, R. C., Panaccio, A., Hu, J., & Meuser, J. D. (2014). Servant leadership: Antecedents, consequences, and contextual moderators. In D. V. Day (Ed.). *The Oxford handbook of leadership and organizations* (pp. 357–379). Oxford: Oxford University Press.

Litchfield, R. C., Karakitapoğlu-Aygün, Z., Gumusluoglu, L., Carter, M., & Hirst, G. (2018). When team identity helps innovation and when it hurts: Team identity and its relationship to team and cross-team innovative behavior. *Journal of Product Innovation Management, 35*(3), 350–366.

Liu, S., Schuler, R. S., & Zhang, P. (2013). External learning activities and employee creativity in Chinese R&D teams. *Cross Cultural Management: An International Journal, 20*(3), 429–448.

Luciano, M. M., DeChurch, L. A., & Mathieu, J. E. (2018). Multiteam systems: A structural framework and meso-theory of system functioning. *Journal of Management, 44*(3),

1065–1096.

Mackey, J. D., Frieder, R. E., Brees, J. R., & Martinko, M. J. (2017). Abusive supervision: A meta-analysis and empirical review. *Journal of Management, 43*(6), 1940–1965.

Malin, J. R., & Hackmann, D. G. (2019). Integrative leadership and cross-sector reforms: High school career academy implementation in an urban district. *Educational Administration Quarterly, 55*(2), 189–224.

Markham, S. K., Green, S. G., & Basu, R. (1991). Champions and antagonists: Relationships with R&D project characteristics and management. *Journal of Engineering and Technology Management, 8*(3–4), 217–242.

Marks, M. A., DeChurch, L. A., Mathieu, J. E., Panzer, F. J., & Alonso, A. (2005). Teamwork in multiteam systems. *Journal of Applied Psychology, 90*(5), 964.

Marks, M. A., & Luvison, D. (2012). Product launch and strategic alliance MTSs. In S. J. Zaccaro, M. A. Marks, & L. A. DeChurch (Eds.). *Multiteam systems: An organization form for dynamic and complex environments* (pp. 33–52). New York, NY: Routledge.

Marks, M. A., Mathieu, J. E., & Zaccaro, S. J. (2001). A temporally based framework and taxonomy of team processes. *Academy of Management Review, 26*(3), 356–376.

Marrone, J. A. (2010). Team boundary spanning: A multilevel review of past research and proposals for the future. *Journal of Management, 36*(4), 911–940.

Marrone, J. A., Tesluk, P. E., & Carson, J. B. (2007). A multilevel investigation of antecedents and consequences of team member boundary-spanning behavior. *Academy of Management Journal, 50*(6), 1423–1439.

Martin, R., Guillaume, Y., Thomas, G., Lee, A., & Epitropaki, O. (2016). Leader–member exchange (LMX) and performance: A meta-analytic review. *Personnel Psychology, 69*(1), 67–121.

Mathieu, J. E., Hollenbeck, J. R., van Knippenberg, D., & Ilgen, D. R. (2017). A century of work teams in the journal of applied psychology. *Journal of Applied Psychology, 102*(3), 452–467.

Mathieu, J. E., Marks, M. A., & Zaccaro, S. J. (2001). Multi-team systems. In N. Anderson, D. Ones, H. K. Sinangil, & C. Viswesvaran (Eds.). *International handbook of work and organizational psychology* (pp. 289–313). London: Sage.

McGrath, J. E. (1962). The influence of quasi-therapeutic relations on adjustment and effectiveness in rifle teams. *Journal of Abnormal and Social Psychology, 65*, 365–375.

McGrath, J. E. (1964). Toward a "theory of method" for research on organizations. In W. W. Cooper, L. Leavitt, & M. W. Shelley (Eds.). *New perspectives in organization research* (pp. 533–547). New York: John Wiley.

McGrath, J. E. (1984). *Groups: Interaction and performance.* Englewood Cliffs, NJ: Prentice-Hall.

Melo, C. D. O., Cruzes, D. S., Kon, F., & Conradi, R. (2013). Interpretative case studies on agile team productivity and management. *Information and Software Technology, 55*(2), 412–427.

Meth, N. D., Lawless, B., & Hawryluck, L. (2009). Conflicts in the ICU: Perspectives of administrators and clinicians. *Intensive Care Medicine, 35*(12), 2068–2077.

Methot, J. R., Rosado-Solomon, E. H., & Allen, D. G. (2018). The network architecture of human capital: A relational identity perspective. *Academy of Management Review, 43*(4), 723–748.

Millikin, J. P., Hom, P. W., & Manz, C. C. (2010). Self-management competencies in self-managing teams: Their impact on multi-team system productivity. *The Leadership Quarterly, 21*(5), 687–702.

Morgeson, F. P., DeRue, D. S., & Karam, E. P. (2010). Leadership in teams: A functional approach to understanding leadership structures and processes. *Journal of Management, 36*(1), 5–39.

Mumford, M. D., Zaccaro, S. J., Harding, F. D., Jacobs, T. O., & Fleishman, E. A. (2000). Leadership skills for a changing world: Solving complex social problems. *The Leadership Quarterly, 11*(1), 11–35.

Murase, T., Carter, D. R., DeChurch, L. A., & Marks, M. A. (2014). Mind the gap: The role of leadership in multiteam system collective cognition. *The Leadership Quarterly, 25*(5), 972–986.

Newell, S., David, G., & Chand, D. (2007). An analysis of trust among globally distributed work teams in an organizational setting. *Knowledge and Process Management, 14*(3), 158–168.

Newell, S., & Swan, J. (2000). Trust and inter-organizational networking. *Human Relations, 53*(10), 1287–1328.

Nickerson, J. A., & Zenger, T. R. (2008). Envy, comparison costs, and the economic theory of the firm. *Strategic Management Journal, 29*(13), 1429–1449.

Nicolaides, V. C., LaPort, K. A., Chen, T. R., Tomassetti, A. J., Weis, E. J., Zaccaro, S. J., & Cortina, J. M. (2014). The shared leadership of teams: A meta-analysis of proximal, distal, and moderating relationships. *The Leadership Quarterly, 25*(5), 923–942.

Oh, H., Chung, M. H., & Labianca, G. (2004). Group social capital and group effectiveness: The role of informal socializing ties. *Academy of Management Journal, 47*(6), 860–875.

Oh, H., Labianca, G., & Chung, M. H. (2006). A multilevel model of group social capital. *Academy of Management Review, 31*(3), 569–582.

Park, G., & DeShon, R. P. (2018). Effects of group-discussion integrative complexity on intergroup relations in a social dilemma. *Organizational Behavior and Human Decision Processes, 146*, 62–75.

Pearce, C. L., & Conger, J. A. (2003). All those years ago: The historical underpinnings of shared leadership. In C. L. Pearce, & J. A. Conger (Eds.). *Shared leadership: Reframing the hows and whys of leadership* (pp. 1–18). Thousand Oaks, CA: Sage.

Pedersen, T., Soda, G., & Stea, D. (2019). Globally networked: Intraorganizational boundary spanning in the global organization. *Journal of World Business, 54*(3), 169–180.

Pierce, J. R., & Aguinis, H. (2013). The too-much-of-a-good-thing effect in management. *Journal of Management, 39*(2), 313–338.

Pittinsky, T. L. (2009). *Crossing the divide: Intergroup leadership in a world of difference.* Cambridge, MA: Harvard Business Press.

Pittinsky, T. L., & Simon, S. (2007). Intergroup leadership. *The Leadership Quarterly, 18*(6), 586–605.

Podsakoff, P. M., MacKenzie, S. B., Lee, J. Y., & Podsakoff, N. P. (2003). Common method biases in behavioral research: A critical review of the literature and recommended remedies. *Journal of Applied Psychology, 88*(5), 879–903.

Podsakoff, P. M., MacKenzie, S. B., & Podsakoff, N. P. (2012). Sources of method bias in social science research and recommendations on how to control it. *Annual Review of Psychology, 63*, 539–569.

Podsakoff, P. M., & Organ, D. W. (1986). Self-reports in organizational research: Problems and prospects. *Journal of Management, 12*(4), 531–544.

Porck, J. P., Matta, F. K., Hollenbeck, J. R., Oh, J. K., Lanaj, K., & Lee, S. M. (2019). Social identification in multiteam systems: The role of depletion and task complexity. *Academy of Management Journal, 62*(4), 1137–1162.

Porck, J. P., van Knippenberg, D., Tarakci, M., Ates, N. Y., Groenen, P. J., & de Haas, M. (2018). Do group and organizational identification help or hurt intergroup strategic consensus? *Journal of Management* Advance online publication.

Power, N., & Alison, L. (2017). Offence or defence? Approach and avoid goals in the multi-agency emergency response to a simulated terrorism attack. *Journal of Occupational and Organizational Psychology, 90*(1), 51–76.

Prysor, D., & Henley, A. (2018). Boundary spanning in higher education leadership: Identifying boundaries and practices in a British university. *Studies in Higher Education, 43*(12), 2210–2225.

Purvanova, R. K., & Bono, J. E. (2009). Transformational leadership in context: Face-to-face and virtual teams. *The Leadership Quarterly, 20*(3), 343–357.

Quiroz, R., Brunson, L., & Bigras, N. (2017). Transforming social regularities in a multicomponent community-based intervention: A case study of professionals' adaptability to better support parents to meet their children's needs. *American Journal of Community Psychology, 59*(3–4), 316–332.

Reddy, M. C., Paul, S. A., Abraham, J., McNeese, M., DeFlitch, C., & Yen, J. (2009). Challenges to effective crisis management: Using information and communication technologies to coordinate emergency medical services and emergency department teams. *International Journal of Medical Informatics, 78*(4), 259–269.

Richter, A. W., West, M. A., van Dick, R., & Dawson, J. F. (2006). Boundary spanners' identification, intergroup contact, and effective intergroup relations. *Academy of Management Journal, 49*(6), 1252–1269.

Roby, T. B. (1961). The executive function in small groups. In L. Petrullo, & B. M. Bass (Eds.). *Leadership and interpersonal behavior.* NewYork: Holt, Reinhart & Winston.

Salazar, M. R., Feitosa, J., & Salas, E. (2017). Diversity and team creativity: Exploring underlying mechanisms. *Group Dynamics: Theory, Research, and Practice, 21*(4), 187–206.

Salk, J. E., & Brannen, M. Y. (2000). National culture, networks, and individual influence in a multinational management team. *Academy of Management Journal, 43*(2), 191–202.

Schotter, A., & Beamish, P. W. (2011). Performance effects of MNC headquarters–subsidiary conflict and the role of boundary spanners: The case of headquarter initiative rejection. *Journal of International Management, 17*(3), 243–259.

Shin, Y., Kim, M., & Hur, W. M. (2019). Interteam cooperation and competition and boundary activities: The cross-level mediation of team goal orientations. *International Journal of Environmental Research and Public Health, 16*(15), 2738.

Shuffler, M. L., Jiménez-Rodríguez, M., & Kramer, W. S. (2015). The science of multiteam systems: A review and future research agenda. *Small Group Research, 46*, 659–699.

Somech, A., & Khalaili, A. (2014). Team boundary activity: Its mediating role in the relationship between structural conditions and team innovation. *Group & Organization Management, 39*(3), 274–299.

Spreitzer, G. M., De Janasz, S. C., & Quinn, R. E. (1999). Empowered to lead: The role of psychological empowerment in leadership. *Journal of Organizational Behavior, 20*(4), 511–526.

Stogdill, R. (1974). *Handbook of leadership.* New York: Macmillan.

Stogdill, R. M. (1948). Personal factors associated with leadership: A survey of the literature. *The Journal of Psychology, 25*(1), 35–71.

Stogdill, R. M., & Coons, A. E. (1957). *Leader behavior: Its description and measurement.* Columbus, OH: Ohio State University, Bureau of Business Research.

Stone-Romero, E. F. (2008). The relative validity and usefulness of various empirical research designs. In S. G. Rogelberg (Ed.). *Handbook of research methods in industrial and organizational psychology* (pp. 77–98). Malden, MA: Blackwell.

Sundstrom, E., DeMeuse, K. P., & Futrell, D. (1990). Work teams: Applications and effectiveness. *American Psychologist, 45*, 120–133.

Sung, S. Y., & Choi, J. N. (2012). Effects of team knowledge management on the creativity and financial performance of organizational teams. *Organizational Behavior and Human Decision Processes, 118*(1), 4–13.

Susskind, A. M., Odom-Reed, P. R., & Viccari, A. E. (2011). Team leaders and team members in interorganizational networks: An examination of structural holes and performance. *Communication Research, 38*(5), 613–633.

Tajfel, H., & Turner, J. C. (1979). An integrative theory of intergroup conflict. In W. G. Austin, & S. Worchel (Eds.). *The social psychology of intergroup relations* (pp. 33–47). Monterey, CA: Brooks/Cole.

Takanashi, C., & Lee, K. J. (2019). Boundary spanning leadership, resource mobilisation, and performance of university-industry R&D projects: A study in a Japanese university. *Technology Analysis & Strategic Management, 31*(2), 140–154.

Taneva, S., Grote, G., Easty, A., & Plattner, B. (2010). Decoding the perioperative process breakdowns: A theoretical model and implications for system design. *International Journal of Medical Informatics, 79*(1), 14–30.

Tasselli, S., & Caimo, A. (2019). Does it take three to dance the tango? Organizational design, triadic structures and boundary spanning across subunits. *Social Networks, 59*, 10–22.

Tawse, A., Patrick, V. M., & Vera, D. (2019). Crossing the chasm: Leadership nudges to help transition from strategy formulation to strategy implementation. *Business Horizons, 62*(2), 249–257.

Tepper, B. J. (2000). Consequences of abusive supervision. *Academy of Management Journal, 43*, 178–190.

Tepper, B. J. (2007). Abusive supervision in work organizations: Review, synthesis, and research agenda. *Journal of Management, 33*(3), 261–289.

Tetlock, P. E. (1999). Accountability theory: Mixing properties of human agents with properties of social systems. In L. L. Thompson, J. M. Levine, & D. M. Messick (Eds.). *Shared cognition in organizations: The management of knowledge* (pp. 117–137). Mahwah, NJ, US: Lawrence Erlbaum Associates Publishers.

Thaler, R. H., & Sunstein, C. R. (2008). *Nudge: Improving decisions about health, wealth, and happiness.* New Haven, CT: Yale University Press.

Thompson, J. D. (1967). *Organizations in action: Social science bases of administrative theory.* New York, NY: McGraw-Hill.

Tippmann, E., Scott, P., & Parker, A. (2017). Boundary capabilities in MNCs: Knowledge transformation for creative solution development. *Journal of Management Studies, 54*(4), 455–482.

Turner, J. C. (1985). Social categorization and the self-concept: A social cognitive theory of group behavior. In E. J. Lawler (Ed.). *Advances of group processes.* Greenwich, CT: JAI.

Tushman, M. L., & Scanlan, T. J. (1981). Boundary spanning individuals: Their role in information transfer and their antecedents. *Academy of Management Journal, 24*(2), 289–305.

Uitdewilligen, S., & Waller, M. J. (2018). Information sharing and decision-making in multidisciplinary crisis management teams. *Journal of Organizational Behavior, 39*(6), 731–748.

van Bunderen, L., Greer, L. L., & van Knippenberg, D. (2018). When interteam conflict spirals into intrateam power struggles: The pivotal role of team power structures. *Academy of Management Journal, 61*(3), 1100–1130.

van Knippenberg, D. (2003). Intergroup relations in organizations. In M. West, D. Tjosvold, & K. G. Smith (Eds.). *International handbook of organizational teamwork and cooperative working* (pp. 381–399). Chichester, UK: Wiley.

Villado, A. J., & Arthur, W., Jr. (2013). The comparative effect of subjective and objective after-action reviews on team performance on a complex task. *Journal of Applied Psychology, 98*(3), 514.

Wageman, R. (2001). How leaders foster self-managing team effectiveness: Design choices versus hands-on coaching. *Organization Science, 12*(5), 559–577.

Waldman, D. A., & Atwater, L. E. (1994). The nature of effective leadership and

championing processes at different levels in a R&D hierarchy. *The Journal of High Technology Management Research, 5*(2), 233–245.

Wang, D., Waldman, D. A., & Zhang, Z. (2014). A meta-analysis of shared leadership and team effectiveness. *Journal of Applied Psychology, 99*(2), 181–198.

Wang, G., Oh, I. S., Courtright, S. H., & Colbert, A. E. (2011). Transformational leadership and performance across criteria and levels: A meta-analytic review of 25 years of research. *Group & Organization Management, 36*(2), 223–270.

Weber, M. (1947). *The theory of social and economic organizations.* New York: Free Press.

Widmann, A., & Mulder, R. H. (2018). Team learning behaviours and innovative work behaviour in work teams. *European Journal of Innovation Management, 21*(3), 501–520.

Yan, A., & Louis, M. R. (1999). The migration of organizational functions to the work unit level: Buffering, spanning, and bringing up boundaries. *Human Relations, 52*(1), 25–47.

Yukl, G. (2006). *Leadership in organizations* (6th ed.). Upper Saddle River, NJ: Pearson Education.

Yukl, G. (2012). Effective leadership behavior: What we know and what questions need more attention. *Academy of Management Perspectives, 26*(4), 66–85.

Zaccaro, S. J., & DeChurch, L. A. (2012). Leadership forms and functions in multiteam systems. In S. J. Zaccaro, M. A. Marks, & L. A. DeChurch (Eds.). *Multiteam systems: An organizational form for dynamic and complex environments* (pp. 253–288). New York, NY: Taylor & Francis.

Zaccaro, S. J., Heinen, B., & Shuffler, M. (2009). Team leadership and team effectiveness. In E. Salas, G. F. Goodwin, & C. S. Burke (Eds.). *Team effectiveness in complex organizations: Cross-disciplinary perspectives and approaches* (pp. 83–111). New York: Routledge.

Zaccaro, S. J., Marks, M. A., & DeChurch, L. A. (2012). *Multiteam systems: An organizational form for dynamic and complex environments.* New York: Routledge.

Zaccaro, S. J., Rittman, A. L., & Marks, M. A. (2001). Team leadership. *The Leadership Quarterly, 12*(4), 451–483.

Zhang, C., Wu, F., & Henke, J. W., Jr. (2015). Leveraging boundary spanning capabilities to encourage supplier investment: A comparative study. *Industrial Marketing Management, 49*, 84–94.

Zhu, J., Liao, Z., Yam, K. C., & Johnson, R. E. (2018). Shared leadership: A state-of-the-art review and future research agenda. *Journal of Organizational Behavior, 39*(7), 834–852.