Leading from a Distance:
Advancements in Virtual Leadership Research

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Abstract

Although leadership has long been recognized as critical in virtual environments, observers have noted that a surprisingly small number of studies have focused on virtual leadership. In the current chapter we examine what we currently know about virtual leadership and identify promising future research directions. We begin by examining changes in the leadership context, most notably advances in technology and the growing adoption of virtual work arrangements. We then trace the evolution of the research that has examined virtual leadership at both the dyadic and team levels, highlighting key conceptual and empirical advances. Finally, we conclude the chapter by discussing future research directions that have the potential to make important contributions to both theory and practice in the area of virtual leadership.

Leading from a Distance:

Advancements in Virtual Leadership Research

Fueled by advances in technology and globalization, recent years have witnessed significant growth in virtual work arrangements. Flexible work arrangements, such as telecommuting, have enabled a growing number of employees to work outside the office for some or all of their workweek (Allen, Golden, & Shockley, 2015; WorldAtWork, 2013). In addition, there has been a tremendous increase in the use of virtual teams, which enable organizations to access and connect relevant expertise regardless of where it may be located in the world (Bell & Kozlowski, 2002; Kirkman, Gibson, & Kim, 2012). These changes are reshaping not only how work gets done in organizations but also how leaders interface with their followers. As leaders increasingly find themselves physically separated from the individuals and teams they are charged with leading, direct, face-to-face interactions with followers are giving way to a greater dependence on technology-mediated communication.

Although it is clear that the context of leadership in modern organizations is changing, there is less agreement about what these changes mean for effective leadership. Some have argued that physical distance and electronic communication may make effective leadership impossible (Kerr & Jermier, 1978) or make it difficult for leaders to display certain leader behaviors, such as those associated with transformational leadership (Puranova & Bono, 2009). Others have expressed greater confidence that virtual leadership can approximate traditional, face-to-face leadership, in part because of recent and ongoing advances in electronic communication technologies (Antonakis & Atwater, 2002; Avolio & Kahai, 2003). Still others have proposed that distance may be an essential ingredient for leadership emergence (Antonakis & Jacquart, 2013) and may confer certain advantages, such as allowing leaders to hide their

weaknesses and maintain detachment from the daily operational minutiae (Shamir, 2013).

It is currently difficult to reconcile these different perspectives because advances in technology and the adoption of virtual work arrangements in organizations have thus far outpaced the science of leadership (Avolio, Sosik, Kahai, & Baker, 2014). Bligh and Riggio (2013, p. 2), for example, argue, "The majority of our theories of leadership implicitly suggest that it does not matter how often, across what distances, and through what media leaders and followers interact." Although these assumptions are increasingly being challenged, research on virtual leadership has been limited. In their review of virtual teams research, for instance, Kirkman et al. (2012, p. 808) contend that, "not nearly enough has been done to understand virtual team leadership." Similarly, Avolio et al. (2014) conclude that although it is possible to derive some broad conclusions about virtual leadership from the literature, more specific recommendations and guidelines remain elusive.

In the current chapter, we provide a review of research on virtual leadership, or what is sometimes alternatively referred to as e-leadership or remote leadership, with the aim of not only cataloging what we have learned but also identifying where research in this area should be heading in the future. We begin with an overview of the changing leadership context. In particular, we examine the factors that have led to the growing adoption of virtual work arrangements and consider the potential implications of this trend for the role of leaders in today's organizations. We then review the conceptual and empirical advances that have emerged from the extant research on virtual leadership. Although we acknowledge that leadership is inherently a multilevel phenomenon with interdependencies across levels (Day, 2012), we organize our review into two sections representing the loci that have been the primary focus of virtual leadership research to date: leader-follower dyads and teams. By considering each of

these areas separately, we are better able to trace their evolution and consider the unique elements of virtual leadership within each of these contexts (Kirkman et al., 2012). Finally, we conclude with a discussion of future directions for advancing virtual leadership research.

The Changing Leadership Context

Virtual work arrangements have become a staple in organizations. These arrangements can take the form of flexible work arrangements (FWA), such as a telecommuting arrangements that enable employees to work offsite for some or all of the workweek (Allen et al., 2015; Gajendran & Harrison, 2007), or virtual team membership, in which employees rely on electronic tools to coordinate with one another and are often distributed across multiple geographic locations (Bell & Kozlowski, 2002; Kirkman & Mathieu, 2005; Gibson, Huang, Kirkman, & Shapiro, 2014). Indeed, recent survey data illustrates a vast and growing virtual work landscape. A 2013 WorldAtWork survey of compensation and benefits professionals found that 88% of organizations offered some form of telecommuting to employees, with 34% offering full-time telecommuting arrangements (WorldAtWork, 2013). Moreover, data from the Society for Human Resource Management's (SHRM) 2016 benefits survey documented a threefold increase in telecommuting over the past 20 years (Society for Human Resource Management, 2016a). This striking growth in FWA use has been accompanied by an increased reliance on virtual teams. For example, data from a 2012 SHRM survey of HR professionals found that approximately half of organizations used virtual teams, with multinational organizations utilizing virtual teams the most (66%; Society for Human Resource Management, 2012).

Factors Responsible for the Trend in Virtual Work Arrangements

There are a number of factors fueling the growth in virtual work arrangements. Globalization, technological advancements, increased focus on diversity and inclusion and the work-life interface, and fundamental changes in our understanding of how organizations are structured and how work is conducted have all contributed to employees' ability, motivation, and opportunity to engage in virtual work.

With the rise of globalization, organizations are increasingly spanning national boundaries and employing workers across the globe. To respond to increased global competition, organizations must effectively mobilize employees to address complex, dynamic problems. Virtual work arrangements enable organizations to connect top talent that is distributed across multiple locations in a cost effective manner. Indeed, engaging and connecting talent located in different geographic regions is frequently cited as the chief reason for the use of virtual teams (Society for Human Resource Management, 2012). Not only is this a critical function when collaboration across global business units is becoming more prevalent, but it is also vital at a time when organizational leaders are identifying talent acquisition and talent development as their greatest ongoing challenges (Center for Creative Leadership, 2007).

The development of advanced communication technology has given rise to greater engagement in virtual work by enabling employees working across the globe—or just across the office—to coordinate via multiple forms of electronic media. Beyond the near-universal use of email and mobile devices in today's organizations, recent advances in audio/visual technology and virtual messaging platforms have allowed teams to share richer information in real time. One key development in audio/visual technology is the telepresence system, which enables employees to connect virtually with a level of richness that more closely approximates face-to-

face physical presence than traditional video conferencing systems (Cascio & Montealegre, 2016). Employees working in two locations can meet virtually through a telepresence system and feel as if they are sitting on two sides of the same room together. In a different approach, the development of embodied social proxy technology enables individual employees working remotely to have a greater presence in the office by physically representing them through a life-size monitor or tablet, enabling them to participate in team activities and meetings as if they were in the office in person (Venolia et al., 2010). Alongside developments in audio/visual technology, the growth in virtual platforms has given rise to integrated virtual workspaces like Slack, an app now used by over 75% of Fortune 100 organizations (Hesseldahl, 2016). Slack enables employees to simultaneously share files, archive ongoing conversations about multiple topics, and send instant messages to stay in continuous contact. Other electronic tools, like the recently-released app Twist, facilitate team coordination but de-emphasize synchronous communication (Deahl, 2017), which can be a challenge for teams spanning multiple time zones and with members who often feel the pressure to be perpetually online. In light of these and other technological advancements, organizations have more choices than ever before for addressing traditional barriers to virtual work. In fact, the pace at which technological tools are upgraded and replaced underscores the importance of focusing not on the particularities of any given technology, but rather on how technology can be used to foster high-quality interactions.

In addition to technological advancements, a greater focus on the work-life interface and diversity and inclusion in organizations has made virtual work an increasingly strategic tool for attracting and retaining talent in a diverse workforce (Society for Human Resource Management, 2016b). For example, the workforce now includes more dual career couples, single parent households, older workers, and workers with disabilities than ever before (Bureau of Labor

Statistics, 2017). Virtual work arrangements help employees navigate the work-life interface by providing them with autonomy over where and when they work and enabling them to enact their preferred boundaries between work and non-work domains to reduce conflict between them (Allen, Jonson, Kiburz, & Shockley, 2013; Kossek & Michel, 2011). Virtual work arrangements can also serve as a tool for integrating workers with disabilities, as the Equal Employment Opportunity Commission has indicated that telecommuting may be considered a reasonable accommodation under the Americans with Disabilities Act (Equal Employment Opportunity Commission, 2005). Moreover, virtual work arrangements can play an important role in engaging older workers, as organizations seek to retain experienced employees and facilitate knowledge transfer (Bal, De Jong, Jansen, & Bakker, 2012; Beehr & Bennett, 2014).

Finally, two themes that underlie all of these developments are changes in organizational structure and a shift in how work is conceptualized. As traditional organizational hierarchies have flattened and organizations have adopted alternative structures, such as matrices, employees and teams are becoming increasingly interdependent. Employees are often members of more than one team, reporting to leaders both face-to-face and virtually. Moreover, as work becomes more dynamic and complex, organizations are turning to systems of teams to coordinate work, necessitating virtual communication and synchronization across multiple teams that are often geographically distributed (O'Leary, Woolley, & Mortenson, 2012). In tandem with these changes, work is more often conceived of as a set of behaviors that people engage in, rather than a place where people go. As such, virtual work arrangements have enabled us to fundamentally challenge traditional assumptions of how work is done. Employees can work from their homes and across the globe, connecting virtually with coworkers and organizational leaders through technological tools. Taken together, the growth in virtual work arrangements presents a rich

opportunity for researchers and practitioners to better understand the changing nature of interactions among leaders and employees and the importance of effective leadership in virtual settings.

The Importance of Leadership in the Context of Virtual Work Arrangements

These recent developments have created a new organizational reality for leaders. Leading individuals and teams in a virtual environment is more challenging than in traditional face-to-face settings (Bell & Kozlowski, 2002; Hoch & Kozlowski, 2014), yet the vast majority of senior leaders agree that virtual leadership is a necessary skill for leaders in their organizations (Center for Creative Leadership, 2007). When leaders and employees rely on electronic communication to connect with one another and complete their work, there is a greater possibility for misunderstandings to occur, greater barriers to fostering trust, and greater difficulty in coordinating tasks (Liao, 2017). Thus, virtual settings require leaders to employ a unique set of skills to facilitate the coordination of the group's work and build relationships with followers, whether it be a dyadic relationship with a single telecommuting employee or a set of relationships with members of a virtual team. Data from a survey of leaders conducted by the Center for Creative Leadership reflects widespread agreement that virtual leadership requires more from leaders: 87% of leaders—and 92% of senior executives—agreed or strongly agreed that virtual leadership requires a different set of skills than face-to-face leadership (Center for Creative Leadership, 2007).

Not only do virtual leaders need to draw from the same set of skills that enables them to lead effectively in traditional settings, but they must also hone an additional set of skills, including their facility with technology and the ability to set norms for technology use. Leaders must role-model the appropriate use of communication technology, exhibiting an awareness of

the appropriate type of media to use for a given situation or task and show adaptability and a willingness to learn new technologies (Blackburn, Furst, and Rosen, 2003). They must also be capable of adapting communication technology to help their followers respond to emerging problems or address shifting task requirements over time (Thomas & Bostrom, 2010b). Virtual leaders must also develop and communicate norms about how and when technology should be used. For instance, because it is more difficult to observe what others are working on in virtual settings, leaders must set clear expectations around transparency, open communication, and knowledge sharing in order to facilitate the effective coordination of work tasks (Blackburn et al., 2003). Moreover, when leaders are not working face-to-face with their employees, they must communicate clear expectations about when employees are expected to be available and how quickly they are expected to respond to others. Communicating appropriate technology and work time norms is especially important in the context of global virtual teams, when non-overlapping time zones mean that employees could be working 24 hours a day, 7 days a week. The use of real-time messaging platforms and other forms of electronic communication tools can mean that employees are always accessible, which can have negative consequences on their ability to manage work and non-work boundaries (Butts, Becker, & Boswell, 2015).

Virtual leaders must also be able to lead employees with varying levels of skill and motivation for working virtually, as well as with different demographic characteristics and cultural backgrounds. A recent study by Hill and Bartol (2016), for example, found that empowering leadership was critical for enabling virtual team members to utilize their knowledge and judgement about how to operate in dispersed team situations to engage in effective virtual collaboration and achieve higher individual performance. Past research also suggests that personality and culture are two key factors that leaders should take into consideration (Makarius

& Larson, 2017; Schulze & Krumm, 2007). For example, one study found that employees working in virtual arrangements who were higher in conscientiousness engaged in more self-management tactics, such as planning scheduled work times and following through with set goals (O'Neill, Hambley, & Chatellier, 2014). Moreover, another study found that teams engaging in decision-making using computer-mediated communication performed better when team members had higher levels of openness to experience (Colquitt, Hollenbeck, Ilgen, LePine, & Sheppard, 2002). Past work has also found that employees from individualistic cultures exhibit greater virtual team self-efficacy than employees from collectivistic cultures (Hardin, Fuller, & Davidson, 2007). Apart from personality and culture, other factors, such as generational differences, have received more limited attention in the literature. Despite being frequently cited as an important issue for virtual leaders, there is little empirical work examining generational differences among employees and their impact on virtual team processes and outcomes (Gilson, Maynard, Young, Vartiainen, & Hakonen, 2015). As new generations of employees who have grown up communicating virtually enter organizations in higher numbers, it is possible that some of the aspects associated with virtual work arrangements that have been traditionally viewed as challenges will be reduced, removed, or even leveraged as benefits.

Virtual Dyadic Leadership

The earliest explorations of the relationship between distance and leadership focused on dyadic interactions between supervisors and their subordinates (e.g., Bogardus, 1927; Katz & Kahn, 1978; Napier & Ferris, 1993; Shamir, 1995). Later, as work increasingly shifted from individual jobs to team-based work structures (Kozlowski & Bell, 2013), research expanded to consider leader distance at not only the individual but also the group level of analysis (e.g., Antonakis & Atwater, 2002). We review virtual team leadership research in the following

section, but first examine the conceptual and empirical advances that have emerged from studies on virtual leadership in the context of dyadic supervisor-subordinate relationships. We begin by discussing how leader distance has been conceptualized in the literature and its potential implications for virtual supervisor-subordinate interactions. We then review important developments in virtual dyadic leadership research, highlighting the different forms of leadership that have been examined and key conceptual advances and empirical findings in each area.

Leader Distance

Although the concept of distance in leadership relationships was originally proposed by Bogardus (1927) and appeared in writings over subsequent years (e.g., Katz & Kahn, 1978; Kerr & Jermier, 1978), Napier and Ferris (1993) were the first to offer an explicit definition of leader distance. In their integrative review of distance and supervisory leadership, they presented a model of Dyadic Distance consisting of three dimensions: psychological, structural, and functional. According to Napier and Ferris (1993, pp. 328-329), psychological distance refers to "the psychological effects of actual and perceived demographic, cultural, and value differences between the supervisor and subordinate." Structural distance addresses those aspects of distance that stem from physical structure (e.g., actual physical distance between work locations of a supervisor and subordinate), organizational structure (e.g., degree of centralization), and supervision structure (e.g., amount of task contact between a supervisor and subordinate). Napier and Ferris argue that all of these structural variables are associated with the amount of supervisor-subordinate interaction that is allowed or encouraged. Finally, functional distance describes the quality of the supervisor-subordinate relationship, or whether the employee is a member of the supervisor's in-group or out-group. In their model, Napier and Ferris position

functional distance as mediating the relationships of psychological and structural distance with subordinate outcomes (e.g., performance, satisfaction, withdrawal).

Building on the work of Napier and Ferris, Antonakis and Atwater (2002) present an updated review and theory of leader distance in which they propose three independent dimensions of distance. The first, perceived social distance, generally equates to the psychological distance dimension proposed by Napier and Ferris (1993) in that it deals with perceived differences in status, rank, social standing, and power. The second dimension, physical distance, captures how near or far followers are located relative to their leader. The third and final dimension they propose is perceived frequency of leader-follower interaction. Unlike Napier and Ferris (1993), they argue that this dimension is independent of social and physical distance. A physically distal leader, for example, may use technology to maintain frequent contact with followers. Antonakis and Atwater (2002) use these three dimensions to develop eight typologies of distant leadership, which they then link to leader outcomes at both the individual and group levels of analysis.

Researchers interested in virtual leadership in the context of dyadic supervisor-subordinate relationships have generally focused on two dimensions of leader distance. The first, and by far the most widely used, dimension is the physical distance or separation between the supervisor and subordinate. Although physical distance would seem to be a relatively straightforward construct, observers have noted that there exists considerable variation in how it has been defined and used within the literature (Kiesler & Cummings, 2002; Lewandowski & Lisk, 2013). For example, a number of studies have examined physical distance as a dichotomous variable representing whether or not the leader and follower are located in the same city or state/province (e.g., Bonet & Salvador, 2017; Kelley & Kelloway, 2012), whereas others

have asked employees to rate the extent to which they have regular contact with their supervisors (e.g., Neufeld, Wan, & Fang, 2010) or have focused on the proportion of time employees spend working outside the office (e.g., Golden, 2006; Golden & Veiga, 2008). A second dimension involves the nature of leader-follower interactions, specifically in terms of the degree to which they are mediated by technology. In their conceptualization of e-leadership, for example, Avolio and colleagues have emphasized the role of advanced information technology in mediating the effects of leadership as a social influence process (e.g., Avolio, Kahai, & Dodge, 2001; Avolio et al., 2014).

Although there are differences in how researchers have conceptualized and operationalized virtuality in supervisor-subordinate relationships, there are also some commonalities that cut across these various treatments. First, virtuality is conceptualized as a characteristic of the context in which the leadership relationship exists, rather than as a characteristic of the leader relationship itself (Shamir, 2013). As Avolio et al. (2001, p. 616) state, "In the case of e-leadership the context not only matters, it is part of the construct being studied." Second, these different conceptualizations are functionally similar, in that greater virtuality, whether due to physical distance or technological mediation, is viewed as inhibiting opportunities for leaders and followers to engage in direct observation and contact (Kiesler & Cummings, 2002; Shamir, 2013). It is important to note that although virtuality may present a barrier to direct leader-follower interactions, other forms of interaction may not be similarly affected. Observers have noted, for example, that technology can make it easier for leaders to reach others (Avolio & Kahai, 2003), so the scope and frequency of leader-follower contact may increase (Kahai, 2013).

As discussed earlier, virtuality is generally assumed to add a layer of complexity to the supervisor-subordinate dynamic. Consistent with this view, research has provided evidence that virtual leader-follower relationships are often characterized by lower levels of trust and support than more conventional relationships (Merriman, Schmidt, & Dunlap-Hinkler, 2007) and that greater leader-follower distance is associated with negative follower outcomes, such as reduced in-role performance (Podsakoff, MacKenzie, & Bommer, 1996). However, recent research has begun to adopt a more nuanced approach to studying the effects of virtuality on the leadership dynamic; one that examines how virtuality shapes the effects of different forms of leadership and how these effects may depend on various contingencies. The evolution of these research streams are reviewed below.

Behavioral Leadership

One approach that has been used to study the effects of virtuality in the context of supervisor-subordinate dyads is the behavioral leadership perspective. In particular, research has explored how virtuality influences the relative effectiveness of different types of leadership behaviors, relying primarily on transformational-transactional leadership theory (Bass, 1985; Burns, 1978), which is one of the most widely used leadership theories in the broader leadership literature. Transformational leadership focuses on inspiring and motivating team members to rise above self-interest and act in the interests of the group. Transactional leadership is based on an exchange process of contingent rewards and punishment. Research has revealed that transformational leadership is generally associated with positive outcomes, whereas findings have been more mixed across the different dimensions of transactional leadership (i.e., contingent reward leadership, active and passive management-by-exception). A meta-analysis by Judge and Piccolo (2004) found that contingent reward leadership exhibited a positive

relationship with leader and follower criteria, whereas both active and passive management-by-exception were more inconsistently related to the criteria.

Researchers have argued that more distal leader-follower relationships may make it difficult for leaders to demonstrate transformational leadership behaviors, such as providing meaning for the followers' work and listening to followers' concerns and needs. A series of studies by Howell and colleagues (Howell & Hall-Merenda, 1999; Howell, Neufeld, & Avolio, 2005) provides some support for this argument. They found that transformational leadership led to higher follower and business unit performance in close versus distant situations. Results for the different dimensions of transactional leadership were more mixed. Whereas contingent reward leadership led to higher follower and business unit performance when distance was high versus low, both active and passive management-by-exception leadership produced lower follower performance when followers were more physically distant. A study by Neufeld et al. (2010) on leader-follower dyads varying in physical distance found that ratings of leader effectiveness were positively related to transformational leadership but unrelated to either contingent reward leadership or physical distance. Unfortunately, Neufeld et al. (2010) did not examine whether the degree of distance in the leader-follower dyads moderates the effects of the different types of leadership behaviors. Finally, Kelley and Kelloway (2012) found that the effects of transformational leadership on several employee outcomes (i.e., job satisfaction, organization commitment, and manager trust) were similar in virtual and proximal leader-follower samples. Overall, these studies suggest that virtuality may moderate the effectiveness of transformational and transactional leader behaviors in leader-follower dyads. However, caution should be exercised since research in this area remains limited and has at times produced

mixed findings, which, as we discuss below, is also true for research that has examined the effects of transformational-transactional leadership in virtual team settings.

Leader-Member Exchange

A second and related perspective that has been used to study the effects of virtuality in supervisor-subordinate dyads is leader-member exchange (LMX) theory, which focuses on the relationship between an employee and his or her supervisor (Dienesch & Liden, 1986; Graen & Uhl-Bien, 1995). In high-quality LMX relationships, followers are considered members of the supervisor's in-group and receive greater levels of trust, special privileges, and other treatment that extend beyond simply economic exchange. Employees in low-quality LMX relationships do not receive these benefits and are treated in accordance with the employment contract. A recent meta-analysis by Dulebohn, Bommer, Liden, Brouer, and Ferris (2012) showed that high-quality LMX relationships are generally associated with more positive consequences (e.g., reduced turnover; higher performance, commitment, and justice).

Empirical research that has examined how virtuality influences the effects of LMX has yielded somewhat mixed findings. Several studies have found that the positive effects of high-quality LMX relationships are strengthened in situations characterized by a greater degree of virtuality (Gajendran & Joshi, 2012; Golden, 2006; Golden & Veiga, 2008; Hill, Kang, & Seo, 2014). Golden and Veiga (2008), for example, found that LMX quality exhibited a stronger, positive relationship with organizational commitment, job satisfaction, and job performance among workers who spent more time working virtually. However, others studies have found virtuality to have no effect on LMX-outcome relationships or to dampen the effects of LMX. Howell and Hall-Merenda (1999), for example, found that physical distance failed to moderate the relationship between LMX and follower performance. In a series of two studies, Kacmar et

al. (2003) found that LMX had a weaker relationship with employees' performance ratings when individuals reported infrequent communication with their supervisor.

Contingency Leadership Approaches

The mixed pattern of findings reviewed above suggest that the effects of virtuality on the supervisor-subordinate dynamic might be more complex than previously assumed. As Kahai (2013, p. 101) states, "the difference that IT can be expected to make for leadership is not likely to be uniform or simple." To better understand the influence of virtuality in the context of dyadic leader-follower relationships, research in this area may need to be more contingency based (Kirkman et al., 2012). That is, future research may need to focus greater attention on identifying the circumstances that determine when leader-follower virtuality is more or less challenging. A few studies have already started down this path. Bonet and Salvador (2017), for example, examined the effect of manager-worker separation on the performance of programmers and analysts working in a software maintenance center. They found that manager-worker separation led to lower levels of worker performance when tasks were high in technical and coordinative complexity, but not when they were low in complexity. In addition, they found that the costs of manager-worker separation were weaker when employees were collocated with a greater proportion of their project team members. Adopting a somewhat different approach, Kelley and Kelloway (2012) examine how several elements of the leader-follower relationship context differentially influence leadership in virtual versus proximal environments. They find that, in both virtual and proximal settings, employees' perceptions of control and unplanned communication positively predicted ratings of managers' transformational leadership style, which in turn related positively to several employee outcomes (job satisfaction, organizational commitment, manager trust). However, regularly scheduled communication and an employee's

familiarity with his/her manager exhibited a positive relationship with transformational leadership style in only the virtual context. These findings suggest that certain contextual factors may have a unique or disparate impact on supervisory leadership effectiveness in virtual environments.

Virtual Team Leadership

Virtual teamwork refers to collaboration that occurs between team members who are geographically dispersed and/or interact using technology rather than face-to-face (Bell & Kozlowski, 2002; Kirkman et al., 2012). Due to the demonstrated challenges of collaborating in a dispersed and technology-mediated team environment, researchers have identified leadership as critical for virtual team success and suggested that leadership may play a stronger role when teams are more virtual (Blackburn et al., 2003; Kirkman et al., 2012; Kozlowski & Bell, 2013). However, despite this general recognition of the importance of virtual team leadership, research in this area is still relatively nascent. In their 2004 review of the virtual team literature, Martins, Gilson, and Maynard (2004) identified leadership as a critical area in need of future research. Although a decade later, researchers have noted that "research on VT leadership has grown precipitously" (Gilson et al., 2015, p. 7), they also acknowledge that significant research gaps still remain in understanding virtual team leadership (Kirkman et al., 2012).

In this section, we trace important developments in virtual team leadership research. We highlight the different forms of leadership that have been examined and review key conceptual developments and empirical research findings in each area. In addition, we discuss important moderators and mediating mechanisms that underlie leadership's effects. We start by describing how virtuality has been conceptualized in teams and its implications for virtual team leadership.

Team Virtuality

Virtual team leadership researchers have focused on two dominant dimensions that are most commonly included in conceptualizations of team virtuality. The first dimension, technology dependence, is the extent to which team members rely on technology-mediated communication (e.g., email, videoconference, group decision support systems) rather than face-to-face communication (Bell & Kozlowski, 2002; Gibson & Gibbs, 2006; Kirkman & Mathieu, 2005). Some researchers also differentiate between different types of communication media (Kirkman & Mathieu, 2005), suggesting that a team is more virtual the more it uses media that limits the ability to convey rich and valuable information and restricts real-time interaction (e.g., email). The second dimension is the extent to which team members are geographically dispersed (O'Leary & Cummings, 2007). Geographic dispersion encompasses different measures of physical distance (e.g., spatial dispersion, time zone differences) and configurations of team member dispersion (e.g., geographic subgroups, isolated team members).

There is a strong body of research to show that technology dependence and geographic dispersion can create challenges to effective task execution and relationship development in teams. For example, greater reliance on technology and separation across physical distance and time zones can impede information sharing, task coordination, trust building and conflict management (for a review, see Kirkman et al., 2012). In addition, the configuration or pattern of team member dispersion has implications for virtual team functioning (O'Leary & Mortensen, 2010; Polzer, Crisp, Jarvenpaa, & Kim, 2006). For example, O'Leary and Mortensen (2010) found that geographic subgroups in teams led to stronger in-group/out-group categorization effects that weakened team member identification with the team and increased conflict and coordination problems (O'Leary & Mortensen, 2010). Further, uneven subgroups created an

imbalance that exacerbated these effects with larger subgroups having greater influence on team decisions. Where leaders are co-located relative to the different subgroups in the team also has implications for team functioning, since there is a risk that team members who are in the same subgroup as the leader may receive more attention from and build stronger relationships with the leader (Ocker, Huang, Benbunan-Fich, & Hiltz, 2011).

Given the challenges team virtuality can pose to effective team functioning and performance, a key focus of virtual team leadership research is to understand how different types of leadership help to mitigate these challenges and their effects. Virtual team leadership research begun with a focus on understanding the role of the formal or hierarchical team leader, but has grown to encompass informal emergent and shared leadership on the part of team members (Gibbs, Sivunen, & Boyraz, 2017). We trace this development in our review, starting with the different types of hierarchical leadership perspectives examined in a virtual team context.

Behavioral Leadership

Early virtual team leadership research adopted a dominant perspective used to study dyadic leadership, the behavioral leadership perspective. This perspective has also been broadly applied in more traditional team research (e.g., Burke et al., 2006; Fleishman et al., 1991; Salas, Dickinson, Converse, & Tannenbaum, 1992). The behavioral approach to team leadership distinguishes between two main categories of leader behaviors: relationship-focused (those addressing team members' concerns, well-being and development of effective interpersonal interactions) and task-focused (those that help to facilitate task accomplishment by orchestrating and monitoring the work of the team). Conceptual models of virtual team leadership based on the behavioral perspective (Dulebohn & Hoch, 2017; Liao, 2017) have suggested these behaviors are likely to have a stronger influence on team outcomes for more highly virtual teams. They

argue that relationship-focused leader behaviors can help to compensate for challenges to relationship development resulting from virtuality in teams, such as difficulty in building trust and managing conflict. Similarly, task-focused leadership behaviors provide structure and coordination that help to mitigate the effects of the communication and coordination challenges caused by virtuality.

Empirical virtual team leadership research aligned with the behavioral approach has focused to a large extent on the transformational (relationship focused)/transactional (task focused) leadership framework (Bass, 1985; Burns, 1978). There is empirical evidence from research using experimental teams that transformational leadership has a stronger effect on team outcomes that are more virtual due to their greater use of leaner vs. richer communication media (e.g., Huang, Kahai, & Jestice, 2010; Kahai, Huang, & Jestice, 2012; Purvanova & Bono, 2009). Similarly, transformational leadership (Joshi, Lazarova, & Liao, 2009) and other forms of relationship-focused leadership, such as leader-member exchange (Gajendran & Joshi, 2012), have demonstrated stronger effects in organizational teams that are more highly dispersed. However, there have also been mixed results. For example, some researchers have found no difference in effects of transformational leadership in teams using electronic communication media vs. face-to-face (e.g., Hambley, O'Neill, & Kline, 2007). Also, Hoch & Kozlwoski (2014) found that higher levels of virtuality (assessed as a composite of geographic dispersion, electronic communication and cultural diversity) weakened the positive relationship between transformational leadership and team performance. Similarly, for transactional leadership, some studies have found stronger effects for transactional leadership when teams use leaner communication media (Huang et al., 2010); however, other studies have found no significant differences based on the media used (Hambley et al., 2007; Hoyt & Blascovich, 2003).

In summary, as in more traditional teams, relationship-focused and task-focused leadership appear to have a positive impact in virtual teams. There is also some evidence that their effects may be stronger for teams that are more reliant on leaner communication media. Research has also demonstrated a stronger effect of relationship-focused leadership in teams where members are more geographically dispersed. However, there have also been mixed findings in this area, suggesting that there may be important moderators of relationship-focused and task-focused leadership effects. We discuss this further in a later section related to contingency effects in virtual team leadership research.

Functional Leadership

Researchers have also used the functional perspective (Morgeson, DeRue, & Karam, 2010) to understand the role of leadership in teams. This perspective is based on functional leadership theory (Lord, 1977; McGrath, 1962), which conceptualizes team leadership as the process of satisfying team needs in order to make teams more effective. Defining leadership functions as any leadership actions that contribute to need satisfaction allows for a broader examination of the different ways in which leadership can contribute to effective virtual team functioning. In addition, although most virtual team leadership research has focused on formal leadership enacted by the assigned hierarchical team leader, the functional perspective suggests that leadership functions can be enacted by different sources of leadership beyond the formal team leader, including informal leadership (i.e., shared or emergent leadership) enacted by team members (Morgeson et al., 2010).

Based on a functional team leadership perspective, Morgeson et al. (2010) developed a taxonomy of team leadership functions that can be enacted by different sources of leadership in the team at different phases of the team's task lifecycle. Although these functions were mostly

derived from a review of traditional team research, these researchers propose that some functions might have a stronger impact on team need satisfaction in more highly virtual teams. For example, when the level of geographic dispersion in a team is higher, the leadership functions of setting clear expectations, structuring and planning the team's work and monitoring team performance may assume greater importance because of the increased risk of virtual team members becoming disconnected from the team.

Drawing on the functional approach, researchers have developed models of leadership functions that are particularly germane to addressing the challenges encountered in global virtual teams (Bell & Kozlwoski, 2002; Carter, Seely, Dagosta, DeChurch, & Zaccaro, 2015; Malhotra, Majchrzak, & Rosen, 2007). For example, based on observations of 30 global virtual student teams working on a complex innovation task, Carter et al. (2015) linked the taxonomy of leadership functions proposed by Morgeson et al. (2010) to a global virtual team context by describing how these functions specifically apply to collaboration in global virtual teams. For example, in their framework, Carter et al. propose that leadership functions related to setting goals and expectations should include specific norms related to collaborating across different time zones and cultures. Further extending the functional leadership approach into the realm of virtual teams, researchers have also proposed new leadership functions that specifically support virtual teamwork, for example, functions related to managing the team's technology and technology support, ensuring that dispersed team members have sufficient information about other team members and their expertise, as well as reconciling differences in work approaches and processes resulting from different work locations and organizational membership (Bell & Kozlowski, 2002; Corderoy & Soo, 2008; Malhotra et al., 2007). However, despite these

conceptual developments, empirical virtual team leadership research based on the functional perspective remains sparse.

Empowering Leadership

Virtual team researchers have argued that the challenges of dispersed collaboration over time and space using technology-mediated communication increases demands on team leadership, which makes it difficult for a single hierarchical team leader to effectively lead the team (Bell & Kozlowski, 2002; Hill, 2005; Lipnack & Stamps, 2000). As a result, they have examined forms of leadership where the hierarchical leader shares leadership responsibility with team members (Bell & Kozlowski, 2002; Dulebohn & Hoch, 2017). For example, Bell and Kozlowski (2002) proposed that in more highly virtual teams, the role of the formal team leader is to create an environment in which team members can regulate their own performance. This requires that they share leadership responsibility for functions related to developing and shaping team processes as well as monitoring and managing team performance. Dulebohn and Hoch (2017) also proposed a model of virtual team effectiveness that emphasized formal team leaders sharing leadership responsibility with team members. They argued that this helps to compensate for the potential attenuation of leader influence in virtual teams.

One form of leadership that fits this distributed leadership approach is empowering leadership. Empowering leaders share power with team members while at the same time raising their level of intrinsic motivation and providing support for team members to effectively use the power that has been delegated to them (Arnold, Arad, Rhoades, & Drasgow, 2000). Although limited, empirical research that has examined empowering leadership in conjunction with virtuality in teams suggests that this form of leadership is more important when teams are more highly virtual (Hill & Bartol, 2016; Kirkman, Rosen, Tesluk, & Gibson, 2004). Hill and Bartol

(2016) found that the impact of the formal team leader's empowering leadership behaviors on the effectiveness of their team's virtual collaboration, and ultimately on team performance, was stronger for teams that were more geographically dispersed. In addition, although they did not measure leadership directly, Kirkman et al. (2004) found that team empowerment was more positively related to team effectiveness in teams that met less frequently face-to-face.

Shared and Emergent Leadership

Shared leadership, conceptualized at the team level, refers to team members sharing responsibility for leadership as part of a lateral influence process (Pearce & Conger, 2003; Pearce & Sims, 2000). Emergent leadership, an individual-level construct, refers to an individual team member who takes on the informal role of team leader even though that member has no formal assignment to that position (Schneider & Goktepe, 1983). As a natural extension of the distributed leadership approaches discussed above, researchers have theorized that informal leadership by team members in the form of shared and emergent leadership will positively impact virtual team functioning and performance (Hill, 2005; Hoch & Dulebohn, 2017). Further, researchers propose such leadership will play a stronger role when teams are more virtual, because greater involvement from team members is needed when the formal team leader has more limited ability to interact with and monitor the team (Bell & Kozlowski, 2002; Hill, 2005; Hoch & Dulebohn, 2013).

Empirical research examining emergent and shared leadership in virtual teams generally shows that these forms of informal leadership benefit team performance in teams with a high level of technology dependence and/or geographic dispersion (Carte, Chidambaram, & Becker, 2006; Cogliser, Gardner, Gavin, & Broberg, 2012; Hoch & Kozlowski, 2014; Muethel, Gehrlein, & Hoegel, 2012; Ocker et al., 2011; Pearce, Yoo, Alavi, 2004; Tyran, Tyran, & Shepherd, 2003).

In one of the rare empirical investigations of leadership specific to geographic subgroups in teams, Ocker et al., (2011) also found that the geographic configuration of the team (e.g., degree of distance, relative subgroup size) and the pattern of leader emergence in the team (e.g., relative size of subgroup where emergent leader is located) impacted leadership dynamics in partially distributed teams. In their study, teams benefited from decentralized leadership with emergent leaders in each subgroup.

Although several studies have examined informal leadership in virtual teams, they differ in the types of leadership behaviors that are the focus of the study. For example, Carte et al. (2006) found that geographically dispersed student teams had higher levels of performance when team members shared responsibility for monitoring the timeliness and quality of their team's task, and when these behaviors were exhibited early in the team's life. Hoch and Kozlowski (2014) found that shared leadership behaviors focused on facilitating important cognitive, affective, and behavioral processes were positively related to team performance in geographically dispersed research and development teams. Finally, Cogliser et al. (2012) found that task-oriented emergent leadership in the aggregate predicted team performance in student teams communicating using an electronic communication tool.

Although there is general agreement that hierarchical and shared/emergent leadership can exist simultaneously in teams (Bell & Kozlowski, 2002; Hill, 2005; Hoch & Kozlowski, 2014; Morgeson et al., 2010), as noted earlier, some researchers have proposed that shared leadership might be more important than formal hierarchical leadership in virtual teams (Hill, 2005). Empirical research comparing the effects of formal and informal leadership sources provides some support for this view. For example, Ocker et al.'s (2011) study of leadership effects in partially distributed student teams showed that emergent and shared leadership had stronger

effects on team performance than the assigned team leader. In addition, Pearce et al. (2004) found that shared leadership explained more unique variance than did vertical leadership in teams of geographically dispersed social workers participating in an action-learning project as part of an educational program. However, evidence that shared leadership is more strongly related to team performance in more highly virtual teams is still lacking. Hoch and Kozlowski (2014) examined the interactive effects of shared leadership and virtuality measured as a composite that included geographic dispersion and degree of electronic communication in teams on team performance, but the interaction was not significant.

Contingency Leadership Approaches

The research discussed thus far paints a picture of virtual team leadership that has had mixed empirical results in several areas. As a result, researchers have discussed the need for a contingency approach where the effectiveness of a particular type of leadership depends on various team and task characteristics. For example, Eisenberg, Gibbs, and Erhardt (2016) proposed that shared leadership has a stronger impact when task interdependence and task complexity is high and Gibbs et al. (2017) suggested that hierarchical leadership is more effective in virtual teams composed of organizational members whereas shared leadership is more effective for student teams.

Empirical research supports a contingency perspective. Specifically, the effects of leadership behaviors on virtual team outcomes have been found to vary depending on certain contextual factors such as team member anonymity (transformational and transactional leadership: Kahai, Sosik, Avolio, 2003; Sosik, 1997) and task type (participative and directive leadership: Kahai, Sosik, & Avolio, 2004) for teams interacting electronically using a group decision support system, and leader-member communication frequency in geographically

dispersed teams (leader-member exchange: Gajendran & Joshi, 2012). This contingency perspective is also relevant to research that has compared the effectiveness of different types of leadership. For example, empirical research comparing the relative importance of transformational vs. transactional leadership in student laboratory teams using different communication media have shown mixed results (Hambley et al., 2007; Hoyt & Blascovich, 2003; Kahai et al., 2003; Ruggieri, 2009; Sosik, 1997; Sosik, Avolio, Kahai, 1997). These comparative studies suggest that the type of leadership that is most effective is contingent on the task environment (e.g., team member anonymity, task type), the types of technology used, and the particular aspect of transformational or transactional leadership examined.

Mediating Factors

Although past research has focused primarily on the question of which types of leadership have the most positive impact on virtual team performance, researchers are increasingly seeking to understand the mediating mechanisms through which different types of leadership influence team effectiveness. As noted earlier, a dominant view is that virtuality challenges the development of team cognitive, motivational, and affective emergent states as well as the team processes that foster effective team outcomes. Therefore, the role of leadership is to help the team address these challenges. Mediators from traditional team research that have received particular attention in theoretical models of virtual team leadership are emergent states and team processes such as trust, cohesion, shared mental models, and team conflict (Carter et al., 2015; Dulebohn & Hoch, 2017; Liao, 2017). In addition, more recent theorizing has also included mediators that are specific to a virtual team environment such as virtual collaboration behaviors, which are behaviors that are particularly functional in dealing with the challenges of

interacting with teammates in technology-mediated, geographically dispersed teamwork environments (Hill & Bartol, 2016).

Although limited, some empirical studies have examined the mediating role of team processes and emergent states in the relationship between leadership and virtual team effectiveness (e.g., performance, satisfaction, cohesion). These studies support the notion that the effects of leadership on team outcomes are transmitted through intervening variables commonly examined in the traditional team literature—e.g., trust in leader and team trust (Chen, Wu, Yang, & Tsou, 2008; Hoyt & Blascovich, 2003), cooperative climate (Huang et al., 2010), and feedback positivity (Kahai et al., 2012). With regard to processes specific to virtual teamwork, Hill and Bartol (2016) found that team members' aggregate virtual collaboration behaviors mediated the relationship between team empowering leadership and team performance and that this indirect relationship was stronger for teams that were more geographically dispersed.

Future Research Directions

At the outset of this chapter we noted that advances in technology and the growing adoption of virtual work arrangements are rapidly reshaping not only how work gets done in organizations but also how leaders interface with their followers. To better understand the implications of these changes for effective leadership we have reviewed research on virtual leadership in the context of leader-follower dyads and teams. As summarized in Tables 1 and 2, this work has yielded a number of valuable insights. At the same time, it is clear that research in this area is still relatively nascent and there remains much to learn about virtual leadership. Given the rapid adoption of virtual work within organizations and the recognized importance of leadership in virtual environments, we are surprised by the limited number of empirical studies

that have been done in this area. Although others have expressed a similar sentiment (e.g., Kahai, 2013; Kirkman et al., 2012), it is critical that we take immediate action or risk falling farther behind ongoing developments in technology and work (Avolio et al., 2014). In this final section we highlight several new and necessary areas to be pursued by future research.

Considering the Advantages

Research on virtual leadership has generally assumed that physical dispersion and technology dependence represent obstacles to be overcome. Even research that has adopted more of a contingency based approach has often sought to understand the circumstances under which virtual leadership is more or less problematic (e.g., Bonet & Salvador, 2017). Researchers have suggested, however, that virtuality may confer a number of advantages to both leaders and followers. Shamir (2013), for example, shares how distance can allow leaders to hide their errors and vulnerabilities as well as provide greater opportunity for them to reflect and recharge. He also notes that distance from the leader may provide followers with greater autonomy and empowerment. These potential advantages have received some attention in research on the implications of psychological/social distance for leadership (e.g., Antonakis & Jacquart, 2013; Cole, Bruch, & Shamir, 2009; Katz & Kahn, 1978; Shamir, 1995), but have been essentially ignored in research on physical distance.

There is some evidence, however, that it may be worthwhile to focus greater attention on the bright side of virtuality for leaders and their followers. Bonet and Salvador (2017), for example, found that when workers were collocated with most of their team members, having the manager situated at a different location not only did not harm the workers' performance, it actually improved it. They suggest that coworker collocation can serve as a substitute for leadership, which then makes manager collocation dysfunctional. They also found that when

managers were inexperienced, separation resulted in higher levels of employee performance. Thus, distance may serve to insulate employees from managers who, due to inexperience, may interfere with their work activities. These findings, which emerged unexpectedly in their investigation, suggest that virtuality may, under certain circumstances, confer advantages that have thus far been largely overlooked. Kahai (2013) also discusses how advances in information technology are providing new opportunities for leaders to increase their effectiveness. For instance, by deploying social media leaders may be able to develop a more accurate view of their network and the communication activities of others.

Adopting a Multifaceted Approach

The majority of studies that have been conducted in the virtual leadership domain have focused on a single dimension of virtuality, such as physical distance/dispersion or technological dependence. When researchers have measured multiple dimensions of virtuality, most often they have combined them into a single composite measure (e.g., Gajendran & Joshi, 2012; Hoch & Kozlowski, 2014). The result is that our understanding of how different facets of virtuality influence the leadership dynamic remains limited. There is some evidence, however, to suggest that the effects of different dimensions may not be uniform. Gibson and Gibbs (2006), for example, examined four characteristics of virtuality – geographic dispersion, electronic dependence, structural dynamism, and national diversity – and found that not only were they not highly intercorrelated but that they also had independent and differential effects on innovation in aerospace design teams. Similar research is needed to examine how different dimensions of virtuality influence the effects of leadership on leader and follower outcomes.

At the same time, future research is needed that considers how aspects of physical distance influence and interact with other dimensions of distance, such as social distance and

perceived interaction frequency. Antonakis and Atwater (2002) stress that the different dimensions of distance are independent and, therefore, may emerge as various combinations that have different implications for leadership. For instance, the implications of a leader being physically distant but socially close to followers, may be quite different than if distance on both dimensions is high. Research to date has not focused attention on the interactive effects of different types of distance. As Avolio et al. (2014, p. 126) state, "We know of no research that has actually examined both social and physical distance together to determine how it effects the appropriation of AIT [advanced information technology] and in turn the impact it has on the appropriation of virtual leadership tools and processes."

Defining Virtual Leadership Functions

As noted earlier, the functional perspective has received considerable attention in both the broader team leadership literature (Morgeson et al., 2010) and theorizing about virtual team leadership (Bell & Kozlowski, 2002). However, empirical virtual team leadership research based on the functional perspective remains limited. The functional perspective holds considerable potential for understanding how leaders contribute to virtual team effectiveness and for uncovering the unique functions that team leaders need to perform in the virtual environment. For example, recent research provides evidence that effective virtual team leaders actively manage team adaptation of communication and collaboration technologies to improve interactions and team productivity (Thomas & Bostrom, 2010a), highlighting a potential important extension of functional leadership theory to the virtual team context. In addition, clearly defining virtual leadership functions will enable researchers to conceptualize and test relevant mechanisms that mediate the effects of leadership on team effectiveness. To date, virtual team leadership research that has explored mediating factors has focused primarily on

variables commonly examined in the traditional team literature. Greater attention to the functions virtual team leaders need to perform may help to uncover processes specific to virtual teamwork. The study by Hill and Bartol (2016) reviewed earlier is a first step in this direction, but more work is needed. As Kirkman et al. (2012, p. 808) state, "The radically different environment in which virtual team leaders lead will likely call for novel leadership theories and models that may be specific to virtual teams."

Setting Expectations and Managing Boundaries

As the introduction of new, synchronous technologies make it possible for virtual leaders and their employees to connect at any time, it is critical to understand how to strike an effective balance between fostering real-time interactions, which enable fast information sharing and immediate feedback (Daft & Lengel, 1984; Dennis, Fuller, & Valacich, 2008), and preserving time for distraction-free work. The ability to engage in "deep work," or work that is conducted during an uninterrupted period of concentration (Newport, 2016), is increasingly important as the pace of work quickens and jobs become more complex. Yet, informatics researchers have documented the startling frequency of interruptions and multitasking, which they find negatively impact productivity and performance on complex cognitive tasks (Mark, 2015; Mark, Gonzalez, & Harris, 2005; Mark, Gudith, & Klocke, 2008; Mark, Iqbal, Czerwinski, & Johns, 2015). Although these dynamics are relevant for all virtual work arrangements, they may be intensified in global virtual teams whose members may work from different time zones and have non-overlapping business hours.

In the face of this tension, it is crucial for future research to identify ways that leaders can actively establish and manage communication and work time norms with their employees. Future studies could examine how virtual leaders can facilitate the timely coordination of work

tasks while also accounting for differences in employee work/non-work boundary management preferences (Kossek & Lautsch, 2012). Furthermore, research could consider how leaders of global virtual teams can effectively establish communication norms when employees are nested within different cultural and regulatory contexts. As cultures vary in their orientation toward work time and establishing work/non-work boundaries (Allen, Cho, & Meier, 2014; Ollier-Malaterre & Foucreault, 2016), leaders must consider how the norms they establish fit with the cultural context in which employees are embedded. Moreover, the regulative institutions concerning work hours and technology vary across countries, which impact employee boundary dynamics (Piszczek & Berg, 2014) and have implications for how leaders structure communication with and among employees. A recent example of this is the French "right to disconnect" law that gives workers in companies with 50+ employees the right to negotiate over the conditions of electronic communication use (Boring, 2017).

Examining Virtual Leadership in Context

Observers have noted that our current understanding of virtual leadership is based largely on research that has been case study driven or conducted in the laboratory (e.g., Kirkman et al., 2012). However, the future directions we laid out above call for more research that examines virtual leadership in organizational contexts. In addition, field settings present an opportunity to examine issues, such as time and history, which have been relatively neglected within the virtual leadership literature to date. Furst, Reeves, Rosen, and Blackburn (2004), for example, tracked six virtual project teams over an eight-month period, from inception to project delivery, and found that the teams encountered different challenges at various points in their life cycles. These findings suggest that different virtual leadership functions may be important at different phases of a team's life cycle (Bell & Kozlowski, 2002). In recent years, a number of virtual leadership

studies have utilized field samples (e.g., Gajendran & Joshi, 2012; Hill & Bartol, 2016; Hill et al., 2014), suggesting the locus of research in this area may be shifting from the laboratory to real-world contexts.

Conclusion

Recent advances in technology and the growing adoption of virtual work arrangements introduce additional complexity and challenges for leaders, while also creating new opportunities for them to reach and touch others (Avolio & Kahai, 2003). Research conducted over the past two decades has made a number of important contributions to our understanding of virtual leadership in organizations, although much more work is needed to help leaders respond to the challenges and harness the opportunities that exist in virtual contexts. Our hope is that by detailing where we have been and where we need to go the current chapter will help guide these future efforts.

References

Allen, T., Cho, E., & Meier, L. L. (2014). Work–Family Boundary Dynamics. *Annual Review of Organizational Psychology and Organizational Behavior*, 1(1), 99–121. https://dx.doi.org/10.1146/annurev-orgpsych-031413-091330

Allen, T. D., Golden, T. D., & Shockley, K. M. (2015). How effective is telecommuting? Assessing the status of our scientific findings. *Psychological Science in the Public Interest*, *16*(2), 40–68. https://dx.doi.org/10.1177/1529100615593273

Allen, T. D., Johnson, R. C., Kiburz, K. M., & Shockley, K. M. (2013). Work-family conflict and flexible work arrangements: Deconstructing flexibility. *Personnel Psychology*, *66*(2), 345–376. doi:10.1111/peps.12012

Antonakis, J., & Atwater, L. (2002). Leader distance: a review and a proposed theory. *The Leadership Quarterly, 13,*673-704.

Antonakis, J., & Jacquart, P. (2013). The far side of leadership: Rather difficult to face. In M. C. Bligh & R. E. Riggio (Eds.), *Exploring Distance in Leader-Follower Relationships* (pp. 155-187). New York: Routledge.

Arnold, J. A., Arad, S., Rhoades, J. A., & Drasgow, F. (2000). The empowering leadership questionnaire: The construction and validation of a new scale for measuring leader behaviors. *Journal of Organizational Behavior*, *21*(3), 249-269.

Avolio, B. J., Kahai, S., & Dodge, G. E. (2001). E-leadership: Implications for theory, research, and practice. *Leadership Quarterly, 11(4),* 615-668.

Avolio, B. J., & Kahai, S. S. (2003). Adding the "E" to E-leadership: How it may impact your leadership. *Organizational Dynamics, 31(4),* 325-338.

Avolio, B. J., Sosik, J. J., Kahai, S. S., & Baker, B. (2014). E-leadership: Re-examining transformations in leadership source and transmission. *The Leadership Quarterly*, *25,* 105-131.

Bal, P. M., De Jong, S. B., Jansen, P. G. W., & Bakker, A. (2012). Motivating employees to work beyond retirement: A multi-level study of the role of i-deals and unit climate. *Journal of Management Studies*, *49*(2), 306–331. https://dx.doi.org/10.1111/j.1467-6486.2011.01026.x

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

Beehr, T. A., & Bennett, M. M. (2014). Working after retirement: Features of bridge employment and research directions. *Work, Aging, and Retirement*, 112–128. https://dx.doi.org/10.1093/workar/wau007

Bell, B. S., & Kozlowski, S. J. (2002). A typology of virtual teams: Implications for effective leadership. *Group & Organization Management, 27*, 14-49.

Blackburn, R., Furst, S., & Rosen, B. (2003). Building a winning virtual team: KSAs, training, and evaluation. In C. B. Gibson & S. G. Cohen (Eds.), *Virtual Teams That Work* (pp. 95-120). San Fransisco: Jossey-Bass.

Bligh, M. C., & Riggio, R. E. (2013). Introduction: When near is far and far is near. In M. C. Bligh & R. E. Riggio (Eds.), *Exploring Distance in Leader-Follower Relationships* (pp. 1-9). New York: Routledge.

Bonet, R., & Salvador, F. (2017). When the boss is away: Manager-worker separation and worker performance in a multisite software maintenance organization. *Organization Science, 28(2),* 244-261.

Bogardus, E. S. (1927). Leadership and social distance. *Sociology and Social Research, 12*, 173-178.

Boring, N. (2017). France: Right to disconnect takes effect. United States Library of Congress: Global Legal Monitor. Retrieved from: http://www.loc.gov/law/foreign-news/article/france-right-to-disconnect-takes-effect/

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*, 288-307.

Burns, J. M. (1978). *Leadership*. New York: Free Press.

Bureau of Labor Statistics (2017). Labor force statistics from the Current Population Survey. Retrieved from: https://www.bls.gov/cps/demographics.htm

Butts, M., Becker, W., & Boswell, W. (2015). Time sinks and hot buttons: The effects of electronic communication during nonwork time on anger and work-nonwork conflict. *Academy of Management Journal*, amj.2014.0170. https://dx.doi.org/10.5465/amj.2014.0170

Carte, T. A., Chidambaram, L., & Becker, A. (2006). Emergent leadership in self-managed virtual teams: A longitudinal study of concentrated and shared leadership behaviors. *Group Decision and Negotiation, 15*, 323-343.

Carter, D. R., Seely, P. W., Dagosta, J., DeChurch, L. A., & Zaccaro, S. J. (2015). Leadership for global virtual teams: Facilitating teamwork processes. In J. L. Wildman, R. L. Griffith (Eds.), *Leading global teams: Translating multidisciplinary science to practice* (pp. 225-252). New York: Springer.

Cascio, W. F., & Montealegre, R. (2016). How technology is changing work and organizations. *Annual Review of Organizational Psychology and Organizational Behavior*, *3*(1), 349–375. https://doi.org/10.1146/annurev-orgpsych-041015-062352

Center for Creative Leadership (2007). What's next? The 2007 changing nature of leadership survey. Retrieved from: http://www.ccl.org/wp-content/uploads/2015/04/WhatsNext.pdf

Chen, C. C., Wu, J., Yang, S. C., & Tsou, H. Y. (2008). Importance of diversified leadership roles in improving team effectiveness in a virtual collaboration learning environment. *Educational Technology & Society, 11*(1), 304-321.

Cogliser, C. C., Gardner, W. L., Gavin, M. B., & Broberg, J. C. (2012). Big five personality factors and leader emergence in virtual teams relationships with team trustworthiness, member performance contributions, and team performance. *Group & Organization Management, 37*, 752-784.

Cole, M. S., Bruch, H., & Shamir, B. (2009). Social distance as a moderator of transformational leadership effects: Both a neutralizer and an enhancer. *Human Relations, 62,* 1697-1733.

Colquitt, J. A., Hollenbeck, J. R., Ilgen, D. R., LePine, J. A., & Sheppard, L. (2002). Computer-assisted communication and team decision-making performance: The moderating effect of openness to experience. *Journal of Applied Psychology, 87(2),* 402-410.

Cordery, J. L., & Soo, C. (2008). Overcoming impediments to virtual team effectiveness. *Human Factors and Ergonomics in Manufacturing, 18*(5), 487-500.

Daft, R. L., & Lengel, R. H. (1984). Information richness: A new approach to managerial behavior and organization design. In L. L. Cummings & B. M. Staw (Eds.), Research in Organizational Behavior (Vol. 6, pp. 191–233). Homewood, IL: JAI Press.

Day, D. (2012). Leadership. In S. W. J. Kozlowski (Ed.), *The Oxford handbook of organizational psychology* (pp. 696-729). New York, NY: Oxford University Press.

Deahl, D. (2017). Todoist's Slack competitor is for people who hate constant notifications. Retrieved from: https://www.theverge.com/2017/6/21/15848640/twist-communications-app-doist-slack-competitor

Dennis, A. R., Fuller, R. M., & Valacich, J. S. (2008). Media, tasks, and communication processes: A theory of media synchronicity. *MIS Quarterly*, 32(3), 575–600.

Dienesch, R. M., & Liden, R. C. (1986). Leader-member exchange model of leadership: A critique and further development. *Academy of Management Review, 11,* 618-634.

Dulebohn, J. H., Bommer, W. H., Liden, R. C., Brouer, R. L., & Ferris, G. R. (2012). A meta-analysis of antecedents and consequences of leader-member exchange: Integrating the past with an eye toward the future. *Journal of Management, 38(6),* 1715-1759.

Dulebohn, J. H., & Hoch, J. E. (2017). Virtual teams in organizations. *Human Resource Management Review, 27*(4), 678-693. doi: 10.1016/j.hrmr.2016.12.004

Eisenberg, J., Gibbs, J., & Erhardt, N. (2016). The role of vertical and shared leadership in virtual team collaboration. In C. Graham (Ed.), *Strategic Management and Leadership for Systems Development in Virtual Spaces* (p. 22-42). Hershey, PA: IGI Global.

Equal Employment Opportunity Commission. (2005). Work at home/telework as a reasonable accommodation. Retrieved from http://www.eeoc.gov/facts/telework.html

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. *Leadership Quarterly, 2,* 245-287.

Furst, S. A., Reeves, M., Rosen, B., & Blackburn, R. S. (2004). Managing the life cycle of virtual teams. *Academy of Management Executive, 18(2),* 6-20.

Gajendran, R. S., & Harrison, D. A. (2007). The good, the bad, and the unknown about telecommuting: Meta-analysis of psychological mediators and individual consequences. *Journal of Applied Psychology, 92*(6), 1524–1541. https://dx.doi.org/10.1037/0021-9010.92.6.1524

Gajendran, R. S., & Joshi, A. (2012). Innovation in globally distributed teams: The role of LMX, communication frequency, and member influence on team decisions. *Journal of Applied Psychology, 97*(6), 1252.

Gibbs, J. L., Sivunen, A., & Boyraz, M. (2017). Investigating the impacts of team type and design on virtual team processes. *Human Resource Management Review, 27*(4), 590-603. doi: https://doi.org/10.1016/j.hrmr.2016.12.006

Gibson, C. B., & Gibbs, J. L. (2006). Unpacking the concept of virtuality: The effects of geographic dispersion, electronic dependence, dynamic structure, and national diversity on team innovation. *Administrative Science Quarterly, 51,* 451-495.

Gibson, C. B., Huang, L., Kirkman, B. L., & Shapiro, D. L. (2014). Where global and virtual meet: The value of examining the intersection of these elements in twenty-first-century teams. *Annual Review of Organizational Psychology and Organizational Behavior, 1*(1), 217–244. https://dx.doi.org/10.1146/annurev-orgpsych-031413-091240

Gilson, L. L., Maynard, M. T., Young, N. C. J., Vartiainen, M., & Hakonen, M. (2015). Virtual teams research: 10 years, 10 themes, and 10 opportunities. *Journal of Management, 41*(5), 1313.

Golden, T. D. (2006). The role of relationships in understanding telecommuter satisfaction. *Journal of Organizational Behavior, 27,* 319-340.

Golden, T. D., & Veiga, J. F. (2008). The impact of superior-subordinate relationships on the commitment, job satisfaction, and performance of virtual workers. *The Leadership Quarterly, 19*, 77-88.

Graen, G. B., & Uhl-Bien, M. (1995). Relationship-based approach to leadership: Development of leader-member exchange (LMX) theory of leadership over 25 years: Apply a multi-level multi-domain perspective. *The Leadership Quarterly, 6,* 219-247.

Hambley, L. A., O'Neill, T. A., & Kline, T. J. B. (2007). Virtual team leadership: The effects of leadership style and communication medium on team interaction styles and outcomes. *Organizational Behavior and Human Decision Processes, 103*, 1-20.

Hardin, A. M., Fuller, M. A., & Davison, R. M. (2007). I know I can, but can we? Culture and efficacy beliefs in global virtual teams. *Small Group Research*, *38*(1), 130–155. https://doi.org/10.1177/1046496406297041

Hesseldahl. A. (2016). Three million people now use Slack every day. Retrieved from: https://www.recode.net/2016/5/25/11772938/slack-usage-numbers-scale

Hill, N. S. (2005). Leading together, working together: The role of team shared leadership in building collaborative capital in virtual teams. In M. Beyerlein, S. Beyerlein, & F. Kennedy (Eds.), *Collaborative capital: Advances in interdisciplinary studies of work teams* (Vol. 11, pp. 183-209). New York: Elsevier JAI.

Hill, N. S., & Bartol, K. M. (2016). Empowering leadership and effective collaboration in geographically dispersed teams. *Personnel Psychology*, *69*(1), 159-198.

Hill, N. S., Kang, J. H., & Seo, M-G. (2014). The interactive effect of leader-member exchange and electronic communication on employee psychological empowerment and work outcomes. *The Leadership Quarterly, 25,* 772-783.

Hoch, J. E., & Dulebohn, J. H. (2013). Shared leadership in enterprise resource planning and human resource management system implementation. *Human Resource Management Review, 23*(1), 114-125.

Hoch, J. E., & Dulebohn, J. H. (2017). Team personality composition, emergent leadership and shared leadership in virtual teams: A theoretical framework. *Human Resource Management Review, 27,* 678-693.

Hoch, J. E., & Kozlowski, S. W. J. (2014). Leading virtual teams: Hierarchical leadership, structural supports, and shared team leadership. *Journal of Applied Psychology, 99*, 390-403.

Howell, J. M., & Hall-Merenda, K. E. (1999). The ties that bind: The impact of leader-member exchange, transformational and transactional leadership, and distance on predicting follower performance. *Journal of Applied Psychology, 84(5),* 680-694.

Howell, J. M., Neufeld, D. J., & Avolio, B. J. (2005). Examining the relationship of leadership and physical distance with business unit performance. *The Leadership Quarterly, 16*, 273-285.

Hoyt, C. L., & Blascovich, J. (2003). Transformational and transactional leadership in virtual and physical environments. *Small Group Research, 34*, 678-715.

Huang, R., Kahai, S., & Jestice, R. (2010). The contingent effects of leadership on team collaboration in virtual teams. *Computers in Human Behavior, 26*, 1098-1110.

Joshi, A., Lazarova, M. B., & Liao, H. (2009). Getting everyone on board: The role of inspirational leadership in geographically dispersed teams. *Organization Science, 20*, 240-252.

Judge, T. A., & Piccolo, R. F. (2004). Transformational and transactional leadership: A meta-analytic test of their relative validity. *Journal of Applied Psychology, 89(5),* 755-768.

Kacmar, K. M., Witt, L. A., Zivnuska, S., & Gully, S. M. (2003). The interactive effect of leader-member exchange and communication frequency on performance ratings. *Journal of Applied Psychology, 88(4),* 764-772.

Kahai, S. S. (2013). Leading in a digital age: What's different, issues raised, and what we know. In M. C. Bligh & R. E. Riggio (Eds.), *Exploring Distance in Leader-Follower Relationships* (pp. 63-108). New York: Routledge.

Kahai, S. S., Huang, R., & Jestice, R. J. (2012). Interaction effect of leadership and communication media on feedback positivity in virtual teams. *Group & Organization Management, 37*, 716-751.

Kahai, S. S., Sosik, J. J., & Avolio, B. J. (2003). Effects of leadership style, anonymity, and rewards on creativity-relevant processes and outcomes in an electronic meeting system context. *Leadership Quarterly, 14*(4-5), 499-524.

Kahai, S. S., Sosik, J. J., & Avolio, B. J. (2004). Effects of participative and directive leadership in electronic groups. *Group & Organization Management, 29*, 67-105.

Katz, D., & Kahn, R. L. (1978). *The social psychology of organizations.* New York: Wiley.

Kelley, E., & Kelloway, E. K. (2012). Context matters: Testing a model of remote leadership. *Journal of Leadership & Organizational Studies, 19(4),* 437-449.

Kiesler, S., & Cummings, J. N. (2002). What do we know about proximity and distance in work groups? A legacy of research. In P. J. Hinds & S. Kiesler (Eds.), *Distributed work* (pp. 57-80). Cambridge, MA: The MIT Press.

Kerr, S., & Jermier, J. M. (1978). Substitutes for leadership: Their meaning and measurement. *Organizational Behavior and Human Performance, 22,* 375-403.

Kirkman, B. L., Gibson, C. B., & Kim, K. (2012). Across borders and technologies: Advancements in virtual team research. In S. W. J. Kozlowski (Ed.), *The Oxford handbook of organizational psychology* (pp. 789-859). New York, NY: Oxford University Press.

Kirkman, B. L., & Mathieu, J. E. (2005). The dimensions and antecedents of team virtuality. *Journal of Management, 31*(5), 700-718.

Kirkman, B. L., Rosen, B., Tesluk, P. E., & Gibson, C. B. (2004). The impact of team empowerment on virtual team performance: The moderating role of face-to-face interaction. *Academy of Management Journal, 47*(2), 175-192.

Kossek, E., & Lautsch, B. A. (2012). Work-family boundary management styles in organizations: A cross-level model. *Organizational Psychology Review,* 2(2), 152–171. https://dx.doi.org/10.1177/2041386611436264

Kossek, E. E., & Michel, J. S. (2011). Flexible work schedules. In S. Zedeck (Ed.), *APA Handbook of Industrial and Organizational Psychology Volume 1* (pp. 535–572). Washington, DC: American Psychological Association.

Kozlowski, S. W. J., & Bell, B. (2013). Work groups and teams in organizations. In D. N. Schmitt & S. Highhouse (Eds.), *Handbook of psychology: Industrial and organizational psychology* (Vol. 2, pp. 412-469). Hoboken, NJ: Wiley.

Lewandowski, J., & Lisk, T. C. (2013). Foundations of distance. In M. C. Bligh & R. E. Riggio (Eds.), *Exploring Distance in Leader-Follower Relationships* (pp. 13-38). New York: Routledge.

Liao, C. (2017). Leadership in virtual teams: A multilevel perspective. *Human Resource Management Review*, *27*(4), 648-659. doi: https://doi.org/10.1016/j.hrmr.2016.12.010

Lipnack, J., & Stamps, J. (2000). *Virtual teams: People working across boundaries with technology* (2nd ed.). New York: Wiley.

Lord, R. G. (1977). Functional leadership behavior: Measurement and relation to social power and leadership perceptions. *Administrative Science Quarterly, 22*, 114–133.

Makarius, E. E., & Larson, B. Z. (2017). Changing the perspective of virtual work: Building virtual intelligence at the individual level. *Academy of Management Perspectives, 31*(2), 159–178. https://doi.org/10.5465/amp.2014.0120

Malhotra, A., Majchrzak, A., & Rosen, B. (2007). Leading virtual teams. *Academy of Management Perspectives, 21*(1), 60-70.

Mark, G. (2015). Multitasking in the digital age. Synthesis Lectures On Human-Centered Informatics, 8(3), 1-113.

Mark, G., Gonzalez, V. M., & Harris, J. (2005). No task left behind? Examining the nature of fragmented work. In CHI 2005: Proceedings of the SIGCHI Conference on Human Factors in Computing Systems. https://dx.doi.org/10.1145/1054972.1055017

Mark, G., Gudith, D., & Klocke, U. (2008). The cost of interrupted work: More speed and stress. In CHI 2008: Proceedings of the SIGCHI Conference on Human Factors in Computing Systems. https://dx.doi.org/10.1145/1357054.1357072

Mark, G., Iqbal, S., Czerwinski, M., & Johns, P. (2015). Focused, aroused, but so distractible: A temporal perspective on multitasking and communications. In CSCW 2015: Proceedings of the 18th ACM Conference on Computer Supported Cooperative Work & Social Computing. https://dx.doi.org/10.1145/2675133.2675221

Martins, L. L., Gilson, L. L., & Maynard, M. T. (2004). Virtual teams: What do we know and where do we go from here? *Journal of Management, 30*(6), 805-835.

McGrath, J. E. (1962). *Leadership behavior: Some requirements for leadership training [Mimeographed]*. Washington, DC: U.S. Civil Service Commission.

Merriman, K. K., Schmidt, S. M., & Dunlap-Hinkler, D. (2007). Profiling virtual employees: The impact of managing virtually. *Journal of Leadership & Organizational Studies, 14*(1), 6-15.

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.

Muethel, M., Gehrlein, S., & Hoegl, M. (2012). Socio-demographic factors and shared leadership behaviors in dispersed team: Implications for human resource management. *Human Resource Management*, 51, 525–548.

Napier, B. J., & Ferris, G. R. (1993). Distance in organizations. *Human Resource Management Review, 3(4),* 321-357.

Neufeld, D. J., Wan, Z., & Fang, Y. (2010). Remote leadership, communication effectiveness, and leader performance. *Group Decision and Negotiation, 19,* 227-246.

Newport, C. (2016). *Deep work: Rules for focused success in a distracted world*. New York: Grand Central.

Ocker, R. J., Huang, H., Benbunan-Fich, R., & Hiltz, S. R. (2011). Leadership dynamics in partially distributed teams: An exploratory study of the effects of configuration and distance. *Group Decision Negotiation*, 20, 273–292.

O'Leary, M. B., & Cummings, J. N. (2007). The spatial, temporal, and configurational characteristics of geographic dispersion in teams. *MIS Quarterly, 31*(3), 433-452.

O'Leary, M. B., & Mortensen, M. (2010). Go (con)figure: Subgroups, imbalance, and isolates in geographically dispersed teams. *Organization Science, 21*(1), 115-131.

O'Leary, M. B., Woolley, A. W., & Mortenson, M. (2012). Multiteam membership in relation to multiteam systems. In S. J. Zaccaro, M. A. Marks, & L. DeChurch (Eds.), *Multiteam Systems: An Organization Form for Dynamic and Complex Environments* (141–172). New York Routledge. https://doi.org/10.4324/9780203814772

O'Neill, T. A., Hambley, L. A., & Chatellier, G. S. (2014). Cyberslacking, engagement, and personality in distributed work environments. *Computers in Human Behavior, 40,* 152-160.

Ollier-Malaterre, A., & Foucreault, A. (2016). Cross-National Work-Life Research: Cultural and Structural Impacts for Individuals and Organizations. *Journal of Management*, 20(10), 1–26. https://dx.doi.org/10.1177/0149206316655873

Pearce, C. L., & Conger, J. A. (2003). *Shared leadership: Reframing the hows and whys of leadership.* Sage Publications, Thousand Oaks, CA (2003).

Pearce, C. L., & Sims, H. P., Jr. (2002). Vertical versus shared leadership as predictors of the effectiveness of change management teams: An examination of aversive, directive, transactional, transformational, and empowering leader behaviors. *Group Dynamics: Theory, Research, and Practice,* 6, 172–197.

Pearce, C. L., Yoo, Y., & Alavi, M. (2004). Leadership, social work, and virtual teams: The relative influence of vertical versus shared leadership in the nonprofit sector. In R. E. Riggio & S. S. Orr (Eds.), *Improving leadership in nonprofit organizations.* (pp. 180-203). San Francisco, CA US: Jossey-Bass.

Piszczek, M. M., & Berg, P. (2014). Expanding the boundaries of boundary theory. *Human Relations*, 67(12), 1491-1512.

Podsakoff, P. M., MacKenzie, S. B., & Bommer, W. H. (1996). Meta-analysis of the relationships between Kerr and Jermier's substitutes for Leadership and employee job

attitudes, role perceptions, and performance. *Journal of Applied Psychology, 81(4),* 380-399.

Polzer, J. T., Crisp, C. B., Jarvenpaa, S. L., & Kim, J. W. (2006). Extending the faultline model to geographically dispersed teams: How colocated subgroups can impair group functioning. *cademy of Management Journal, 49*(4), 679-692. doi:10.5465/AMJ.2006.22083024

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

Ruggieri, S. (2009). Leadership in virtual teams: A comparison of transformational and transactional leaders. *Social Behavior & Personality: An International Journal, 37,* 1017-1021.

Salas, E. Dickinson, T. L., Converse, S. A., & Tannenbaum, S. I. (1992). Toward an understanding of team performance and training. In R. W. Swezey & E. Salas (Eds.), *Teams: Their training and performance* (pp. 3-29). Norwood, NJ: Ablex.

Schneider, C. E., & Goktepe, J. R. (1983). Issues in emergent leadership: The contingency model of leadership, leader sex, leader behavior. In H. H. Blumberg, A. P. Hare, V. Kent, & M. F. Davies (Eds.), *Small groups and social interaction* (pp. 413–421). Chicester, England: John Wiley.

Schulze, J., & Krumm, S. (2017). The "virtual team player": A review and initial model of knowledge, skills, and abilities and other characteristics for virtual collaboration. *Organizational Psychology Review*, *7*(1), 66–95. https://doi.org/10.1177/2041386616675522

Shamir, B. (1995). Social distance and charisma: Theoretical notes and an exploratory study. *Leadership Quarterly, 6(1),* 19-47.

Shamir, B. (2013). Notes on distance and leadership. In M. C. Bligh & R. E. Riggio (Eds.), *Exploring Distance in Leader-Follower Relationships* (pp. 39-60). New York: Routledge.

Society for Human Resource Management. (2012). Virtual teams. Retrieved from: http://www.shrm.org/research/surveyfindings/ articles/pages/virtualteams.aspx

Society for Human Resource Management. (2016a). 2016 employee benefits: Looking back at 20 years of employee benefits offerings in the U.S. Retrieved from https://www.shrm.org/hr-today/trends-and-forecasting/research-and-surveys/pages/2016-employee-benefits.aspx

Society for Human Resource Management. (2016b). SHRM survey findings: 2016 strategic benefits - Flexible work arrangements. Retrieved from: https://www.shrm.org/hr-today/trends-and-forecasting/research-and-surveys/Documents/SHRM-Survey-Findings-Strategic-Benefits-Flexible-Work-Arrangements.pdf

Sosik, J. J. (1997). Effects of transformational leadership and anonymity on idea generation in computer-mediated groups. *Group & Organization Management, 22*(4), 460-487.

Sosik, J. J., Avolio, B. J., & Kahai, S. S. (1997). Effects of leadership style and anonymity on group potency and effectiveness in a group decision support system environment. *Journal of Applied Psychology, 82*(1), 89-103.

Thomas, D. M., & Bostrom, R. P. (2010a). Team leader strategies for enabling collaboration technology adaptation: team technology knowledge to improve globally distributed systems development work. *European Journal of Information Systems, 19,* 223-237.

Thomas, D. M., & Bostrom, R. P. (2010b). Vital signs for virtual teams: An empirically developed trigger model for technology adaptation interventions. *MIS Quarterly, 34(1),* 115-142.

Tyran, K. L., Tyran, C. K., & Shepherd, M. (2003). Exploring leadership in virtual teams. In C. B. Gibson, & S. G. Cohen (Eds.), Virtual teams that work (pp. 183–195). San Francisco, CA: Jossey-Bass.

Venolia, G., Tang, J., Cervantes, R., Bly, S., Robertson, G., Lee, B., & Inkpen, K. (2010). Embodied social proxy: Mediating interpersonal connection in hub-and-satellite teams. In *CHI 2010: Proceedings of the 28th International Conference on Human factors in Computing Systems*. New York: ACM Press. https://doi.org/10.1145/1753326.1753482

WorldatWork (2013). Survey on workplace flexibility 2013. Retrieved from https://www.worldatwork.org/adimLink?id=73898

Table 1

Summary of Virtual Dyadic Leadership Research

Leadership Theory	*Representative Studies*	*Key Findings*
Behavioral Leadership Leader behaviors categorized as relationship-focused (e.g., transformational leadership) and task-focused (e.g., transactional leadership)	Howell & Hall-Merenda (1999) Howell, Neufeld, & Avolio (2005) Kelley & Kelloway (2012) Neufeld, Wan, & Fang (2010)	• Some empirical evidence that distance may weaken the effects of transformational leadership, although one study found no difference in the effects of transformational leadership across virtual and proximal leader-follower samples • Some empirical evidence that contingent reward leadership has more positive effects when distance is high • Some empirical evidence that both active and passive management-by-exception have more negative effects when distance is high
Leader-Member Exchange Focuses on the quality of the relationship between an employee and his or her supervisor	Gajendran & Joshi (2012) Golden & Veiga (2008) Hill, Kang, & Seo (2014) Howell & Hall-Merenda (1999) Kacmar, Witt, Zivnuska, & Gully (2003)	• Several studies have found that the positive effects of high-quality LMX relationships are strengthened in situations characterized by greater virtuality • Other studies have failed to find an effect of virtuality on LMX-outcome relationships or have found that virtuality weakens the effects of LMX
Contingency Leadership Effectiveness of team leadership depends on other factors (e.g., task characteristics, familiarity)	Bonet & Salvador (2017) Kelly & Kelloway (2012)	• Some evidence that leader-follower separation is more detrimental when workers' tasks are high in technical and coordinative complexity • Some evidence that regularly scheduled communication and an employee's familiarity with his/her manager is more important for leader effectiveness in virtual settings

Table 2

Summary of Virtual Team Leadership Research

Leadership Theory	***Representative Studies***	***Key Findings***
Behavioral Leadership Leader behaviors categorized as relationship-focused (e.g., transformational leadership) and task-focused (e.g., transactional leadership)	Hambley, O'Neill, & Kline (2007) Hoyt & Blascovich (2003) Huang, Kahai, & Jestice (2010) Joshi, Lazarova, & Liao, (2009) Liao (2017) Purvanova & Bono (2009)	Mixed empirical results: • Some evidence that relationship-focused and task-focused leadership have stronger effects in teams that make more use of leaner vs. richer communication media • Other studies have found no difference in the effect of relationship-focused and task-focused leadership based on the type of communication media • Relationship-focused leadership shown to have a stronger effect in teams where members are more geographically dispersed
Functional Leadership Leadership conceptualized as the process of satisfying team needs in order to make teams more effective; describes leadership functions that contribute to team need satisfaction	Bell & Kozlowski (2002) Carter, Seely, Dagosta, DeChurch, & Zaccaro (2015) Corderoy & Soo (2008)	• Research in this area is mainly theoretical • Focused on understanding how leadership functions identified in traditional team research apply in virtual teams as well as identifying new leadership functions that are particularly germane to virtual teamwork

Empowering Leadership Leadership behaviors that involve a hierarchical leader sharing leadership responsibility with team members	Bell & Kozlowski (2002) Dulebohn & Hoch (2017) Hill & Bartol (2016) Kirkman, Rosen, Tesluk, & Gibson (2004)	• Theoretical research proposing that in more highly virtual teams, empowering leadership is more strongly related to team effectiveness • Some empirical evidence that empowering leadership has stronger effects in teams that are more highly dispersed or meet less frequently face-to-face
Emergent and Shared Leadership Informal leadership by an individual team member (emergent leadership) or shared among members of the team (shared leadership)	Carte, Chidambaram, & Becker (2006) Cogliser, Gardner, Gavin, & Broberg (2012) Hill (2005) Hoch & Kozlowski (2014) Muethel, Gehrlein, & Hoegel (2012) Ocker, Huang, Benbunan-Fich, & Hiltz (2011) Pearce, Yoo, & Alavi (2004)	• Theoretical research proposing that in more highly virtual teams, informal emergent/shared leadership is more strongly related to team effectiveness, but empirical evidence is lacking • Empirical studies generally show that informal emergent/shared leadership benefits team performance in highly virtual teams, but the focal leadership behaviors differ between studies • Some evidence that shared leadership is more strongly related to team effectiveness than formal hierarchical leadership in more highly virtual teams
Contingency Leadership Effectiveness of team leadership depends on other factors (e.g., team and task characteristics, team context)	Eisenberg, Gibbs, & Erhardt (2016) Gajendran & Joshi (2012) Hambley, O'Neill, & Kline (2007) Hoyt & Blascovich (2003) Kahai, Sosik, & Avolio (2003) Ruggieri (2009) Sosik, Avolio, & Kahai (1997)	• Contingency effects have been examined in relation to different types of leadership, including formal vs. informal leadership, transformational vs. transactional leadership, participative vs. directive leadership, leader-member exchange • The leadership contingencies examined include team characteristics (e.g., student vs. organizational team), task characteristics (e.g., task interdependence, task type), and team contextual factors (e.g., team member anonymity, leader-member communication frequency)