

Virtual Teams Research: 10 Years, 10 Themes, and 10 Opportunities

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Ten years ago, Martins, Gilson, and Maynard reviewed the emerging virtual team (VT) literature. Given the proliferation of new communication technologies and the increased usage of work teams, it is hardly surprising that the last decade has seen an influx of VT research. In this review, we organize the last 10 years of empirical work around 10 main themes: research design, team inputs, team virtuality, technology, globalization, leadership, mediators and moderators, trust, outcomes, and ways to enhance VT success. These themes emerged inductively because they either represent areas with consistent results, a large proliferation of studies, or a grouping of studies and results that differed from where the literature stood a decade ago. Following the review section, we turn our attention toward 10 opportunities for future research: study setting, generational impacts, methodological considerations, new and emerging technologies, member mobility, subgroups, team adaptation, transition processes and planning, creativity, and team member well-being. Some of these opportunities emerged from our review of the extant VT literature; others are grounded in the broader team literature, are unresolved theoretical issues, or were linked to insights discussed within the VT practitioner literature. Within the domain of VTs, technological innovation continues to advance the way team members interact and enable individuals who previously could not be connected to work together as a

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team. Accordingly, VTs provide great promise to organizations, and the field continues to be rich with research opportunities for the coming decade(s).

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Given the numerous technological advancements (e.g., Priem, Li, & Carr, 2012) and the enthusiasm that surrounds the use of organizational teams (Mathieu, Maynard, Rapp, & Gilson, 2008), it is not surprising that the use of virtual teams (VTs) continues to rise. A recent survey suggests that approximately 66% of multinational organizations utilize VTs (Society for Human Resource Management, 2012), and 80% of companies surveyed believe this number will continue to grow (Perry, 2008). A decade ago, Martins, Gilson, and Maynard (2004) reviewed the VT literature. Since then, there has been an extensive amount of new research that has moved the domain forward, suggesting that the time is right to once again assess the state of the field and provide directions for future research.

The initial focus of this review is to synthesize the last decade of VT research. Given the prevalence of work in this area, integrating approximately 450 articles from 200 different journals crossing numerous research fields presents a somewhat daunting task! On one hand, the field is rich with a great deal of good work; on the other hand, a review should be more than a laundry list of findings. When embarking upon this review, we had no preconceived ideas about how the VT literature had developed over the past decade. However, in order to provide some structure to our review, we coded all empirical studies with regard to sample (i.e., types of teams, team size, duration of task, etc.), methodology used, and the specific inputs, processes, emergent states, and outcomes examined.

Inductively, on the basis of this detailed categorization, a number of themes began to emerge. Specifically, these themes were identified because they represent areas where there were either consistent results, a large proliferation of studies, or a grouping of studies and results that differed from where the literature stood a decade ago. Interestingly, some themes that emerge are broad and cover a range of constructs (i.e., inputs), whereas others are much more narrow and focused (i.e., trust and leadership).

While each theme is meaningful in its own right, rather than merely list the themes in a random fashion, we organized them such that they follow a somewhat traditional input-process-outcome (IPO) type logic (e.g., McGrath, 1964). We start with a broad contextual theme that incorporates *research design*, followed by a broad *team inputs* theme. Then, we highlight four themes that also consider team inputs but are more targeted: *team virtuality*, *technology*, *globalization*, and *leadership*. Next, we consider two themes that have considered both mediators and moderators—a broader *mediator and moderators* theme followed by a section detailing the robust literature that has examined *trust* within VTs. The final two themes highlight the *outcomes* that have been considered within this research stream and work that has considered *ways to enhance VT success*.

Within each section, we note some key works but predominantly focus on interpreting how research is shaping what we know, both practically and theoretically, about VTs. We identified studies to include in our review through a search of several electronic databases using a list of relevant terms (e.g., *team* and *virtual*, *virtuality*, *virtualness*); a manual scan of

leading journals in management, international business, information systems, and business communications; a search of proceedings from academic conferences; and a scan of the references from the articles identified. This initial search resulted in over 1,000 articles, which we narrowed to 441 on the basis of our assessment of whether the emphasis was truly on VTs. While we coded all 441 articles, we primarily focus our review on the 243 empirical examinations.

Again, we start our discussion highlighting the 10 themes that emerged out of our structured review of the extant literature. Within the second half of this article, we offer 10 areas that we identify as fruitful research opportunities. Several of these opportunities emerged organically out of our in-depth review of the empirical work examining VTs over the past decade. Additionally, a number of the research opportunities emerged from our review of practitioner-oriented articles. In several instances, the discussions surrounding VTs that we found within these practitioner outlets mirrored what was being suggested as avenues for future research in academic papers (i.e., new technologies, generational effects, and team member well-being).

Accordingly, while most of the review themes that we highlight are connected to a corresponding future research opportunity, there are a number of opportunities that might surprise the reader. For that, we are unapologetic, as our aim is to highlight what has emerged over the last decade as the most fruitful and practically salient areas that VT researchers should explore moving forward. As such, we ground the opportunities in the broader team literature, to unresolved theoretical issues, and to insights discussed within the VT practitioner literature.

Ten Years: 10 Prevalent VT Research Themes

Theme 1—Research Design

Previously, VT research predominantly occurred in lab settings using student teams, where VTs were compared to their face-to-face (FtF) counterparts. While some researchers continue this trend ($n = 51$ or 21% of studies coded), our review also found that there are now a number of in-depth case studies ($n = 43$, 18%), as well as work that has focused exclusively on VTs ($n = 78$, 32%). Lastly, a relatively new type of study, one in which virtuality is assessed ($n = 71$, 29%) has started to receive a fair amount of consideration and will be discussed more thoroughly in Theme 3 (Team Virtuality).

Across research designs, several key points emerge; first, studies are now very diverse in terms of their disciplinary focus as VTs are now being examined in disciplines such as accounting, applied psychology, business management, communication, computer technology, education, engineering, information systems, and software design. Second, much of the work has been very consistent with regard to the inputs (e.g., task features, compositional factors, technology, and leadership), mediators (e.g., communication, coordination, conflict, and trust), moderators (e.g., virtuality and interdependence), and outcomes (e.g., performance and affective reactions) considered. However, the manner in which these constructs have been examined is quite distinct. For example, in comparing VT and FtF teams, researchers have tended to focus on the implications of leveraging technology (e.g., Martinez-Moreno, Gonzalez-Navarro, Zornoza, & Ripoll, 2009), while those that have sought to unpack virtuality have examined the implications of the virtuality continuum in terms of

team dynamics and performance (e.g., Schweitzer & Duxbury, 2010). Finally, a number of researchers have qualitatively studied VTs in order to explore various constructs over time (e.g., Capece & Costa, 2009).

Additionally, it is encouraging to see that researchers have responded to calls for more work in field settings. In our sample, 50% of the empirical studies occurred within field-based settings. Thus, while student teams ($n = 108$, 44%) are still used, a positive trend has been the increase in work on real-world teams. That said, there has also been a tendency for much of this work to focus on expert groups, including information technology professionals (e.g., Baruch & Lin, 2012), software developers (e.g., Muethel, Gehrlein, & Hoegl, 2012), research and development (e.g., Stark & Bierly, 2009), consulting (e.g., Suh, Shin, Ahuja, & Kim, 2011), new product development (e.g., Stark & Bierly), and engineering teams (e.g., Forester, Thoms, & Pinto, 2007). This trend raises some design questions regarding whether this field-based research has been conducted on expert teams because these are the teams that are most likely to work virtually or whether these are merely convenience samples. In response, within Research Opportunity 1 (Study Settings), we outline how research over the coming decade can expand upon the types of teams and contexts within which VTs are examined.

Theme 2—Team Inputs

Inputs or drivers of VT effectiveness continue to receive a great deal of consideration. Whereas earlier research focused primarily on member demographics, knowledge, skills, and abilities, work conducted over the last decade has shifted to composition, culture, multiteam membership, and task considerations. In terms of composition, numerous studies have examined team size as well as member sex, race, age, and personality (e.g., Martins & Shalley, 2011; Mockaitis, Rose, & Zetting, 2012). For instance, Luse, McElroy, Townsend, and DeMarie (2013) found that openness to experience resulted in individual preference for VTs over FtF teams, but when the comparison was working in a VT versus working alone, extroverts tended to trust VT environments more than introverts. Interestingly, many of the prior negative effects associated with demographic differences are now less prevalent (e.g., Berg, 2012). In part, we suspect that such tendencies may be the result of newer generations who take VTs for granted. However, given that the question of whether workers from various generations view VTs differently has not received much empirical consideration, we highlight this as an opportunity for future research (see the Research Opportunity 2—Generational Impacts section).

Newer team inputs examined over the last decade include multiple team membership, the amount of time members allocate to a focal team (e.g., Cummings & Haas, 2012), experience working together, and familiarity (e.g., Bierly, Stark, & Kessler, 2009). In addition, researchers have started to delve more deeply into the implications of task characteristics. For instance, several studies have noted that task interdependence can improve VT performance (e.g., Chi, Chang, & Tsou, 2012) and that the formalization of decision making is associated with decision process quality (e.g., Bourgault, Drouin, & Hamel, 2008). Lastly, time or temporal factors (e.g., Caballer, Gracia, & Peiró, 2005) has started to be considered as an input and here, findings suggest that technology fit becomes more critical as time pressure increases. Taken together, inputs continue to be seen as important and receive considerable attention, and the number of new constructs makes this a vibrant area of inquiry.

Theme 3—Team Virtuality

Probably the biggest change in the VT literature over the last decade has been the inclusion of virtuality. This makes sense, given that most organizational teams can to some extent be considered virtual (e.g., Kirkman, Gibson, & Kim, 2012). While the definition of virtuality is multidimensional (e.g., de Guinea, Webster, & Staples, 2012), the two most consistently used dimensions are geographic dispersion and technology usage (e.g., S. G. Cohen & Gibson, 2003). Researchers also emphasize the salience of work practices (e.g., Chudoba, Wynn, Lu, & Watson-Manheim, 2005), the transitory nature of the team structure (Harvey, Novicevic, & Garrison, 2005), and member roles and relationships (Gibson & Gibbs, 2006).

While the literature has started to coalesce around the dimensions of virtuality, there remains a lack of consistency regarding whether it should be considered as an input (e.g., Gonzalez-Navarro, Orengo, Zornoza, Ripoll, & Peiró, 2010; Kock & Lynn, 2012) or a moderator (e.g., Andressen, Konradt, & Neck, 2012). As an input, virtuality has been found to reduce social loafing (e.g., Bryant, Albring, & Murthy, 2009) while increasing perceptions of manager's competence and team member satisfaction (e.g., Henderson, 2008). However, high levels of virtuality can impair team functioning by reducing perceptions of productivity (e.g., Henderson) and limiting extrarole behavior (e.g., Ganesh & Gupta, 2010). As a moderator, virtuality appears to strengthen the relationship between inspirational leadership, commitment, and trust (e.g., Joshi, Lazarova, & Liao, 2009) but dampen the relationship between hierarchical leadership and performance (e.g., Hoch & Kozlowski, 2012).

With regard to the operationalization of virtuality, geographic dispersion has been measured as a single item, asking team members to state how many times they met FtF (Kirkman, Rosen, Tesluk, & Gibson, 2004), and as an aggregate composite of multiple geographic dispersion components, such as the distance in miles among team members (Hoch & Kozlowski, 2012). Suh and Shin (2010) operationalized geographic dispersion at the dyadic level, asking each team member to indicate whether they work at the same location as each person on their team. They then utilized these scores to arrive at a team-level measure of geographic dispersion. For technology use, a common operationalization is to have team members allocate the percentage of communication that occurs via various computer-mediated communication (CMC) tools (e.g., Rapp, Ahearn, Mathieu, & Rapp, 2010), which can then be weighted on the basis of media richness to calculate virtuality (Ganesh & Gupta, 2010).

While there is considerable theoretical work in this area, it appears that empirical attention has lagged and is needed to better understand how virtuality, and its dimensions, fit within the broader nomological network. A first step is to derive a more unified measurement and treatment of the construct, which would allow for comparisons to be made across studies. Accordingly, in addition to more carefully considering how team virtuality is measured, we highlight a variety of other methodological opportunities that remain underexplored within the VT literature in our discussion of Research Opportunity 3 (Methodological Considerations).

Theme 4—Technology

Technology is frequently considered an input that serves to enable communication and performance monitoring (Hertel, Geister, & Konradt, 2005). However, most research finds that technology either impairs (e.g., Schweitzer & Duxbury, 2010; van der Kleij, Schraagen,

Werkhoven, & De Dreu, 2009) or has no effect on VT performance (e.g., Han, Hiltz, Fjermestad, & Wang, 2011). Work by Andres (2012) suggests that technology-mediated collaboration creates lags in information exchange, a greater occurrence of misunderstandings, a reduction in information seeking attempts, and more incoherent messages. In contrast, Lowry, Roberts, Romano, Cheney, and Hightower (2006) found VTs were better suited to overcome the challenges associated with increased team size than their FtF counterparts.

Taking a more fine-grained approach, Bryant and colleagues (2009) found that the use of certain CMCs can decrease the presence of social loafing. Likewise, the ease of CMC use can increase overall satisfaction (Chi et al., 2012), reduce status differences between team members (Anderson, McEwan, Bal, & Carletta, 2007), and offset challenges induced by task complexity for teams that leverage multiple CMC options (Kock & Lynn, 2012). Finally, in a study of consulting and software development teams, Suh and colleagues (2011) found that personalized CMC (i.e., e-mail and instant messaging) exhibited a positive effect on extra-group network size and structural holes, whereas communal CMC (i.e., group discussions, group calendars, audioconferences, and videoconferences) increased intragroup tie strength.

With regard to technology, it is interesting to note that the majority of studies continue to focus on traditional options, such as e-mail, chat, and discussion boards (e.g., Duranti & de Almeida, 2012; Lin, Chiu, Joe, & Tsai, 2010), but while multiple new CMCs exist (e.g., meeting tools, social networking), few have received research attention. In response, we highlight within Research Opportunity 4 (New and Emerging Technologies) some of the new technologies that merit attention. Likewise, given that many of these technologies are enabling team members to work from almost anywhere at any time, within Research Opportunity 5 (Member Mobility), we suggest directions that research can explore regarding the implications of mobility.

Theme 5—Globalization

Given that VTs allow organizations to build teams with less attention to geographic location (e.g., Martins et al., 2004), it is not surprising that many of the teams considered within the literature are composed of members located across the globe (e.g., Zakaria, Amelinckx, & Wilemon, 2004). Likewise, it is enlightening to note that the location of scholars who study VTs also has expanded to include almost every corner of the globe. Even with this expansion, across disciplines and global locations, there are a great number of similarities across studies.

Related to globalization is the construct of cultural diversity (e.g., Hoch & Kozlowski, 2012), where findings suggest that perceived differences in national culture and language barriers can adversely affect team identification (e.g., Au & Marks, 2012). Taking a more detailed approach, Mockaitis and colleagues (2012) found that within global VTs, members with a more collectivistic rather than individualistic orientation have more favorable impressions of team processes. Similarly, Dekker, Rutte, and Van den Berg (2008) found that team members from certain countries (e.g., the United States) felt it more important to include team members in discussions and decisions than did individuals from other locations (e.g., Belgium, India, and The Netherlands). There are several examples of work that examined Hofstede's (2001) dimensions of national culture. Specifically, Duranti and de Almeida (2012) found that some cultures (i.e., Brazil) prefer richer CMC options, such as audio- and

videoconferencing, while others (i.e., the United States) expressed a preference for weaker CMC tools, such as e-mail and chat.

Beyond these investigations, work also has investigated the impact of global VTs on the development of trust. Lowry, Zhang, Zhou, and Fu (2010) compared culturally heterogeneous (China and the United States) and homogeneous teams, finding no significant differences in trust formation between FtF teams and VTs (Lowry et al.). Moreover, in a longitudinal study of global VTs, Goh and Wasko (2012) found that when everyone's actions were visible, trust was not a key factor in resource allocation. Finally, in globally distributed teams, trust dampened the negative effects of member diversity on performance (Garrison, Wakefield, Xu, & Kim, 2010).

Lastly, given the geographic dispersion of members of global VTs, such teams are more likely to experience the creation and implications derived from subgroups (e.g., O'Leary & Mortensen, 2010). Subgroups can be based on cultural similarities, time zones, language, and the like, and research finds that subgroups can affect team effectiveness (e.g., Jarman, 2005). Given the likelihood of subgroups within VTs and the limited amount of work in this area, Research Opportunity 6 (Subgroups) details the need for more focused examinations of the formation and implications of subgroups within VT contexts.

Theme 6—Leadership

Research on VT leadership has grown precipitously, with two popular areas being leader behaviors and traits. Here, work has examined inspirational (e.g., Joshi et al., 2009) as well as transformational and transactional leaders (e.g., Huang, Kahai, & Jestic, 2010; Strang, 2011). In VTs, transformational leadership appears to arise from personality and communication factors (Balthazard, Waldman, & Warren, 2009) and can increase performance, satisfaction (Purvanova & Bono, 2009), and motivation (Andressen et al., 2012). A study by Ruggieri (2009) found that leaders who focused on relationships rather than task-based factors were perceived as more intelligent, creative, and original. In contrast, transactional leaders were described as authoritative, task focused, and possessing high levels of self-esteem.

Several studies have examined the interaction between leadership and virtuality, finding that team members are more satisfied with their team and leader and perceive their leader as being better able to decode messages when the leader is geographically distant from the team (Henderson, 2008). Hoch and Kozlowski (2012) found that virtuality dampened the relationship between hierarchical leadership and performance while enhancing the relationship between structural supports and performance.

In addition to these more prevalent leadership topics, work in this area has considered emergent leadership (e.g., Carte, Chidambaram, & Becker, 2006). Glückler and Schrott (2007) found that communication behaviors influenced who emerged as a leader. Similarly, leader-member exchange (Goh & Wasko, 2012), perceptions of supportive leadership (Schepers, de Jong, de Ruyter, & Wetzels, 2011), leadership functions (Konradt & Hoch, 2007), and cross-cultural leadership (Sarker, Sarker, & Schneider, 2009) have all received attention, as has work examining the impact of the type of recognition a leader utilizes to motivate workers (e.g., Whitford & Moss, 2009). Clearly, leadership within VTs is important. As such, we suspect leaders may play a central role in VT functioning, particularly as they influence how a team deals with obstacles and how the team ultimately adapts in the

face of such challenges. Given the prominence of team adaptation research (Baard, Rench, & Kozlowski, 2014), the salience of adaptation within VTs, and the role of leaders in assisting teams to adapt (e.g., Marks, Zaccaro, & Mathieu, 2000), in the Research Opportunity 7 (Team Adaptation) section, we describe the numerous opportunities that exist for examining the leadership, process, and performance implications of adaptation within VTs.

Theme 7—Mediator and Moderators

Employing the three team process categories introduced by Marks, Mathieu, and Zaccaro (2001), we find that while considerable research over the past decade has examined action and interpersonal processes, work in the area of transition processes (planning, goal specification, and strategy formulation) is noticeably lacking and is highlighted in Research Opportunity 8 (Transition Processes and Planning).

In terms of action processes, communication, coordination, and knowledge sharing have received the most consideration. These processes are critical in predicting team efficiency and effectiveness (e.g., Kock & Lynn, 2012). Work here has started to assess the relationships between conflict (i.e., task, process, or relationship) and communication genre (i.e., delegation, solicitation; Hsu & Chou, 2009) and combine communication and coordination processes, finding that while task-oriented communication is critical during early stages, task-knowledge coordination becomes more salient in predicting team performance later in the team's life cycle (Kanawattanachai & Yoo, 2007). Recently, Penarroja, Orengo, Zornoza, and Hernandez (2013) found that as virtuality increased, team coordination declined, but this relationship was partially mediated by levels of trust. Likewise, Cummings, Espinosa, and Pickering (2009) found that the use of synchronous CMC reduced coordination delays for members in overlapping time zones, but asynchronous CMC did not reduce coordination delays for teams with nonoverlapping work hours but, instead, reduced coordination delays for teams with members with overlapping work hours. Lastly, knowledge sharing, deep-level diversity (e.g., Pinjani & Palvia, 2013), frequency of interaction (e.g., Suh & Shin, 2010), team politics (e.g., Baruch & Lin, 2012), and social capital (Liu & Li, 2012) were all found to be key drivers.

Moving to interpersonal processes, most of the research continues to focus on conflict management (e.g., Chiravuri, Nazareth, & Ramamurthy, 2011). In part, this is attributable to work suggesting that conflict is more likely in VTs (e.g., Furumo, 2009). Here, Stark and Bierly (2009) find that relationship conflict negatively affects team satisfaction to an even greater extent as virtuality increases. In terms of antecedents to conflict, Cramton and Webber (2005) suggest that geographic dispersion adversely affects team processes, including conflict management. Wakefield, Leidner, and Garrison (2008) emphasize the important role that the VT leaders play in abating the impact of conflict. Finally, Furumo finds that less motivated VT members were more likely to utilize conflict avoidance management styles.

In terms of emergent states, potency and efficacy (e.g., Ortega, Sanchez-Manzanares, Gil, & Rico, 2010), team commitment (e.g., Lin et al., 2010), cohesion (e.g., Jarman, 2005), team identity (e.g., Au & Marks, 2012), team empowerment (e.g., Kirkman et al., 2004), and psychological safety (e.g., Maynard, Mathieu, Rapp, & Gilson, 2012) have all been found to be key predictors of success. Given that most research over the last decade has studied knowledge workers, recent work has also emphasized the important role that shared mental models

(e.g., Andres, 2012) and transactive memory systems (e.g., O'Leary & Mortensen, 2010) can have on VT performance.

Theme 8—Trust

It is interesting to note that despite its somewhat narrow focus, trust is one of the most studied variables in the VT literature. Understanding how, why, and under what conditions trust develops remains a popular topic of research. In part, the popularity of trust can be attributed to results that suggest that it positively affects VT success (e.g., Furumo, 2009). Within VTs, trust is influenced by communication behaviors, timely responses, open communication, and giving feedback (e.g., Henttonen & Blomqvist, 2005). Likewise, there is a tradition of considering swift trust as this form of trust has been found to be critical for VTs working on common tasks within a finite time span (Meyerson, Weick, & Kramer, 1996). More recent findings suggest that swift trust is most likely established through early communication and a positive tone (e.g., Coppola, Hiltz, & Rotter, 2004) and can influence performance by improving members' confidence and subsequent trust (Crisp & Jarvenpaa, 2013).

Within VTs, trust formation is often based on perceptions of other team members' ability (Clark, Clark, & Crossley, 2010). However, a critical new development is the linking of trust to knowledge sharing (e.g., Liu & Li, 2012), knowledge transfer, and exchange (Quigley, Tesluk, Locke, & Bartol, 2007). Pinjani and Palvia (2013) examined the role of functional and deep-level diversity, finding deep-level diversity to be more salient for both trust and knowledge sharing. Additionally, both interpersonal trust and trust in technology were found to be relevant for knowledge sharing (Golden & Raghuram, 2010), while insufficient knowledge sharing may result from a lack of interpersonal trust and trust in technology (Breu & Hemingway, 2004).

Theme 9—Outcomes

Within the VT literature, most research continues to examine team effectiveness and member affective reactions. Unfortunately, given the myriad of constructs included under the umbrella of effectiveness, it is actually quite difficult to gain a clear understanding of the impact of working in VTs. For example, research suggests that working in VTs can have a positive impact on effectiveness (e.g., Kock & Lynn, 2012; Maynard et al., 2012), whereas others provide evidence suggesting that working virtually negatively affects effectiveness (e.g., Cramton & Webber, 2005; Schweitzer & Duxbury, 2010). In addition, the *source* of how effectiveness is measured has varied tremendously. However, a positive trend seems to be that work within this domain is starting to leverage ratings from outside the team (e.g., Andressen et al., 2012; Cummings & Hass, 2012) as well as objective measures of team performance (e.g., Rapp et al., 2010; Rico & Cohen, 2005).

When considering the subdimensions of effectiveness, several researchers have examined project quality (e.g., Altschuller & Benbunan-Fich, 2010). This makes sense, given that VTs are often used for specific projects. In addition, the quality of decisions made, as well as time to arrive at a decision, have been considered as outcomes with findings typically being that it takes VTs more time to make a decision (e.g., Pridmore & Phillips-Wren, 2011). Lastly, the number of unique ideas that the team can generate (e.g., Alnuaimi,

Robert, & Maruping, 2010) also has been considered. That said, creativity is an outcome construct that has started to receive considerable attention in the team literature but has not received much consideration within the realm of VTs (see the Research Opportunity 9—Creativity section).

Moving away from effectiveness, satisfaction has been examined in terms of team members' satisfaction with internal discussions (e.g., Huang et al., 2010) as a process (e.g., Andres, 2012), outcome (e.g., Chiravuri et al., 2011), and overall measure (e.g., de Guinea et al., 2012). This work suggests that members of VTs can attain high levels of satisfaction (regardless of the specific type) as long as the intervening variables within the VT are adequately managed. For instance, if teams exhibit learning behaviors (e.g., Ortega et al., 2010), have goal commitment, effectively manage conflict (e.g., Pazos, 2012), have effective leadership (e.g., Purvanova & Bono, 2009), and have adequate technological capabilities (e.g., van der Kleij et al., 2009), satisfaction can be achieved. Finally, member willingness to work together in the future (viability), turnover intentions (e.g., Ortega et al.), organizational commitment (e.g., Horwitz, Bravington, & Silvis, 2006), and confidence in the team's capability (e.g., Turel & Connelly, 2012) have all started to receive empirical consideration.

Theme 10—Ways to Enhance VT Success

Potentially as a result of the realization that most teams are to some extent virtual, a great deal of research over the last decade has focused on mechanisms to enhance VT success. For example, Boros, Meslec, Curseu, and Emons (2010) emphasized the need for members to feel that they are equal and connected to improve cooperation and conflict management tactics. Likewise, VTs that establish goals early in their life cycle have demonstrated increased cohesion and performance (e.g., Brahm & Krunze, 2012). Similarly, a positive social atmosphere and reinforcing predictable communication patterns are essential for VT success (Coppola et al., 2004). Horwitz and colleagues (2006) discuss the value of creating strong relationships, whereas Cummings and Haas (2012) demonstrate the need for more dispersed teams to have members spend more time on the focal team task. Rice, Davidson, Dannenhoffer, and Gay (2007) detail how having formal and structured procedures and processes can increase effectiveness. Work in this area also suggests that team motivation and performance can be improved by utilizing mixed-incentive rewards (e.g., Bryant et al., 2009) as well as group-based rewards (e.g., Quigley et al., 2007). In addition to leveraging these techniques to improve overall VT performance, they likely have the benefit of positively affecting team member well-being, which has not been considered extensively in VTs to date (see the Research Opportunity 10—Team Member Well-Being section).

In trying to better understand what drives VT success, several studies have considered the role of training. Here, research supports training in topics as diverse as intercultural (e.g., Holtbrügge, Schillo, Rogers, & Friedmann, 2011), teamwork (e.g., Rosen, Furst, & Blackburn, 2007), and technology usage (e.g., Kanawattanachai & Yoo, 2007). In fact, training interventions appear particularly salient for VT members who lack VT experience (e.g., Dineen, 2005). This finding may explain the popularity of work focused on methods to train college students to ultimately function in VTs (e.g., Berg, 2012; Gilson, Maynard, & Bergiel, 2013).

Conclusions Based on 10 Themes and 10 Years of VT research

The goal of the 10 themes discussed above was to highlight some of the key areas of inquiry within VT research over the last 10 years. These themes suggest that what we know about VTs continues to grow, and areas such as leadership, action processes, and knowledge management that were previously labeled as gaps (Martins et al., 2004) have now received considerable attention. Researchers also have heeded the calls to integrate new settings, samples, methodologies, and theories. Likewise, within some key constructs, namely, leadership and trust, findings have coalesced. On the basis of this review, we now move to a discussion of 10 promising opportunities for future research.

The Next 10 Years: 10 Opportunities for Future VT Research

VT research offers a unique opportunity where theory and practice can work together. Therefore, while several future research opportunities are based on unresolved theoretical issues and were foreshadowed above, others emerged from the practitioner literature where issues such as emerging technologies and member well-being are frequently discussed (e.g., Bailey, 2013; Malhotra & Majchrzak, 2005). In keeping with the framework utilized in the review section of this article, we have ordered the opportunities so that toward the beginning, we discuss broad contextual considerations—*study settings* and *methodological considerations*. We also consider opportunities that involve various team inputs (*generational impacts, new and emerging technologies, member mobility, and subgroups*) followed by two opportunities that involve mediators (*team adaptation* and *transition processes and planning*). In closing, we discuss two outcomes that appear salient to VTs but have not yet received much research attention (*creativity* and *team member well-being*).

Research Opportunity 1—Study Settings

As discussed above, VT research has moved into the field, yet the types of teams studied have been composed primarily of knowledge-intensive workers. While these contexts certainly leverage VTs extensively, we see opportunities to expand to other settings. For instance, it is still an open question as to the efficacy of using VTs for workers of various skill levels. Research has yet to fully examine the dynamics at play when VTs are formed as low cost options or in response to the requirements of the task itself, such as within the oil and gas industry, where part of a team may need to be located offshore (e.g., Bayerl & Lauche, 2010). Likewise, while VTs can cross organizational boundaries (e.g., Shin, 2004), research examining cross-organizational VTs is limited. As such, a number of opportunities exist for future research that considers how VTs function across various organizations, industries, positions, and skill levels.

Another example of a new research setting is the medical field, which is increasingly leveraging technology to enhance efficiency and improve patient care. Technology is enabling physicians located in remote locations to supervise the care of patients at other geographic locations (e.g., Aust, 2012). Likewise, technology allows for specialists (i.e., radiologists) to be located in different locations and called on when needed (e.g., Lau, Ng, & Chhem, 2012). These multiteam systems (e.g., Marks, DeChurch, Mathieu, Panzer, & Alonso, 2005) are complex, and how technology or virtuality plays out within these settings

has not been considered. Accordingly, there are a great number of opportunities for research over the coming decade(s) to leverage the lessons being learned within the broader VT and organizational team literatures to enhance the ways in which interactions occur in novel contexts such as energy and health care.

Research Opportunity 2—Generational Impacts

To date, VT research has worked under the assumption that team members may encounter difficulties when communication occurs via CMC. As such, much of the extant research has focused on ways to mitigate barriers created by technology (e.g., Blaise, Erich, & Phillip, 2008; Rosen et al., 2007). Despite the barriers and difficulties highlighted by previous research, we contend that as the next generation of employees (i.e., millennial) enters the workplace, many of these previously hypothesized difficulties may be overstated.

The millennial generation is the first to grow up with computers and access to multiple means of CMC (Gorman, Nelson, & Glassman, 2004). Not surprisingly, their attitudes toward using and adopting technology differ from those of prior generations (Morris & Venkatesh, 2000). This increased comfort and acceptance of technology may allow millennial employees to be less affected by CMC and may necessitate a theoretical readjustment in how we study VTs. As described by Gorman and colleagues, the millennial generation has the “ability to effectively utilize broadly networked digital communication technologies to quickly and seamlessly accomplish a wide variety of tasks” (2004: 257). In effect, the younger generations may view working in a VT as commonplace and working in FtF environments as the exception.

Secondly, working in a VT may align with the values and expectancies of younger employees. The millennial generation is believed to place a greater value on work–life balance (Carless & Wintle, 2007). As VTs allow for greater flexibility and mobility, this may align with their expectations for balance. Furthermore, as a result of the speed that younger generations can access information through technology, they often expect instantaneous access (Hershatter & Epstein, 2010). This makes virtual, as opposed to in-person meetings, preferable. While an in-person introductory meeting was often touted as helpful for VT success (e.g., Martins et al., 2004), the next generation of employees may see this as a waste of time or even an unnecessary barrier. It has been noted that the millennial generation perceives CMC as a way to decrease boundaries and increase collaboration (Myers & Sadaghiani, 2010). Thus, participation in a VT may actually be optimal for younger employees.

When reviewing the last decade of VT research, it should be noted that while age and familiarity with technology are frequently controlled for, they have not been considered as a primary variable of interest. Currently, VT research often considers the impact of national or cultural factors (e.g., Lowry et al., 2010), but we posit that comparing the generational impact of members or subgroups may highlight some key differences. Furthermore, research should begin to explore some of the advantages that younger employees may bring to VTs, as these employees may be the most comfortable with using CMC as well as adapting it to the needs of a task or project (e.g., Gorman et al., 2004; Morris & Venkatesh, 2000). Moreover, exploring the behaviors of different generations (i.e., communication, knowledge sharing, and collaboration) may provide an understanding regarding how to eliminate perceived barriers created by virtuality. Lastly, research should consider decoupling whether barriers found

within the VT context are attributable to virtuality or experience with technology. When individuals resist or are fearful about reliance on technology, this could have a huge impact on how technology is used. Virtual competence is related to positive outcomes (Wang & Haggerty, 2011) but has been explored only minimally. Particularly because of the increased comfort that the younger generations have with technology, we propose that virtual competence and generational impacts are an interesting opportunity for future scholarship.

Research Opportunity 3—Methodological Considerations

Our review of the extant literature suggests that while great strides have been made, the majority of studies remain cross-sectional (e.g., Golden & Fromen, 2011). Because cross-sectional designs are subject to common method variance and other limitations (Schwab, 2004), we suggest that moving forward, researchers incorporate longitudinal designs. It is only through longitudinal work that the complex nature of team dynamics can really be understood. Some notable exemplars over the last decade highlight this point; for instance, Geister, Konradt, and Hertel (2006) studied 52 student VTs for 5 weeks and found that performance increased over time for those VTs that used an online feedback system. Likewise, Metiu (2006) conducted a 4-year ethnographical examination and found that status and geographical boundaries shaped interactions between VT members working in the United States and India.

In addition, longitudinal work is needed to understand the effects of time, which is critical for organizational teams (e.g., Kozlowski & Bell, 2003). For instance, within VTs, does it matter when new members are added because of their specific expertise or existing members are rotated off because their expertise is no longer needed? Does the effect of membership change differ depending on how long the team has worked together or where the team is with regard to its project life cycle? Longitudinal designs allow for assessments of reciprocal relationships and feedback loops central to the input-mediator-output-input framework (e.g., Ilgen, Hollenbeck, Johnson, & Jundt, 2005).

A promising trend within the empirical studies included in this review is the increased use of social network analysis (SNA; e.g., Behrend & Erwee, 2009; Hsu & Chou, 2009; Suh et al., 2011). SNA allows visual illustration of the underlying team structure and can provide a richer understanding of team dynamics that could be valuable in discovering the presence and the impact of subgroups because SNA produces quantitative statistics (e.g., network centrality) that can be combined with other numerical indicators (e.g., questionnaire data; see Scott, 1988). Capece and Costa (2009) used SNA to study social networks and knowledge creation in VTs and revealed how team configuration was related to dimensions of knowledge creation over time. Given the intriguing results that are emerging from the use of SNA, we call for future research to continue leveraging this technique to further our understanding of VTs.

Somewhat surprisingly, given that VT communication can be captured, we found very few studies that provided an in-depth analysis of communication records. Bjørn and Ngwenyama (2009) used team communication records as a means to investigate shared meaning, communication breakdowns, and transparency. In a similar manner, Hsu and Chou (2009) used e-mail transcripts to study communication genres among students. Interestingly, Sivunen and Hakonen (2009) found that VT members' interview results were partly contradicted by the analysis of the CMC transcripts. In interviews, members stated that CMC was

not sufficient for transmitting the fine-grained social cues needed to build a shared social identity (e.g., Fiol & O'Connor, 2005). However, the analysis of CMC transcripts revealed many strategies, such as self-disclosure and the use of humor, which were clearly aimed at building social identity. Given that using actual communication records may lessen the impact of same-source bias (e.g., Podsakoff, MacKenzie, & Podsakoff, 2012) and may actually pinpoint phenomena that are not evident on the basis of other data collection approaches (e.g., Miles & Huberman, 1984), we suggest that future research consider utilizing such an approach to a greater extent.

Finally, we see the need for VT research to more fully appreciate the potential for nonlinear relationships. A recent study by Kirkman, Cordery, Mathieu, Rosen, and Kukenberger (2013) considered the impact of national diversity on performance and found a curvilinear (U-shaped) relationship moderated by both media richness and psychological safety. Accordingly, future research may want to consider nonlinear relationships as a means to address the complex relationships within the team virtuality nomological network.

Research Opportunity 4—New and Emerging Technologies

The use of technology to communicate is an underlying assumption of VTs. Over the past decade, the range of CMC products has continued to grow, and teams can now leverage collaboration tools (e.g., Huddle, Blackboard Collaborate), document sharing (e.g., Sharepoint, Dropbox), document cocreation (e.g., Scribblar, Google Docs), meeting tools (e.g., GoToMeeting, Google Hangouts), project management tools (e.g., Microsoft Project, Basecamp), and social networking (e.g., Yammer, Jive). However, while this extensive list of CMC tools are being leveraged in practice, within research, the norm remains to examine conventional CMC tools. Consequently, new and emerging technologies that are *actually* being used have received scarce consideration (Koutsabasis, Vosinakis, Malisova, & Paparounas, 2012), meaning that here, research appears not to be keeping up with practice.

One emerging technology that is receiving a great deal of organizational and popular press attention is 3D virtual environments (3DVEs), which are communication systems where multiple participants share the same 3D digital space despite occupying remote physical locations. This technology allows participants to navigate, manipulate objects, and interact with one another via avatars (Sallnäs, 2005; Yee & Bailenson, 2007). While the uses of 3DVEs appear promising, we found only five articles on 3DVEs. Specifically, Luse, Mennecke, and Triplett (2013) noted the usability and fit of 3DVEs with work tasks, whereas Bosch-Sijtsema and Sivunen (2013) revealed that 3DVEs' main usages were for meetings, conferences, training, and building work-related communities. However, a downside associated with this newer CMC is that it is still plagued by technological problems and the need for adaptation to be useful. Theoretically, there are now technologies available that transcend much of what we know about media richness and question many of our assumptions with regard to virtuality. As teams start to leverage these sorts of complex technologies, what does this mean for our existing knowledge with regard to the levers necessary to help ensure VT success?

Another technological advancement that research has not adequately addressed is the use of social media (e.g., Culnan, McHugh, & Zubillaga, 2010). Social media is used extensively by large companies like Procter & Gamble, who use wikis for collaboration and blogs for knowledge sharing plus a social network application to ease finding others with a specific

expertise (Lai & Turban, 2008). Work by Gilson and colleagues (2013) noted that the first thing students do when placed in a VT is try to find other team members using social media. In addition to social media, there are cloud technologies and ubiquitous computing platforms that enable virtual teaming and have not received much attention in the literature. Accordingly, a great many opportunities exist for future research to examine these *newer* technologies.

Research Opportunity 5—Member Mobility

Researchers converge on the view that VTs are complex, adaptive, and dynamic systems that exist in the larger context of people, tasks, technologies, and settings (e.g., Martins et al., 2004). A unique feature of VTs is that they allow members to work together regardless of time, space, and place. Harrison and Dourish explain the difference between *space* and *place* being that “everyday actions take place in a place; space is the opportunity; place is the understood reality” (1996: 69). Baskerville and Nandhakumar (2007) proposed that the virtual workplace is an environment that facilitates communication and collaboration that moves with the team member. The ideas of mobility and multilocality are new to the literature and present a number of challenges and opportunities for future research and practice.

Until recently, it was assumed that work was conducted at a specific place. The increase of mobile computing has meant that individuals can now be multilocational (R. L. Cohen, 2010; Vartiainen & Hyrkkänen, 2010) in that VT members can work in completely different contextual environments or an individual’s workspace may be continually changing. Mobile technologies and wireless connections in particular make it possible for VT members to not only work in and from multiple places but also move between locations. This mobility means that work can truly be done *anytime, anywhere*. However, to date, VT research has yet to fully appreciate this fact and the influence it may have on the internal dynamics and performance of teams.

In addition to changing physical settings, mobility can influence individual mind-sets. Team members act in accordance with the norms and expectations of their space. Therefore, studying the possible moderating and mediating impacts that mobility may have on team processes and outcomes requires some careful conceptualization and operationalization. For example, what are the definitions of mobility, space, place, location, and even workplace?

Future research needs to consider how mobile work affects team processes, emergent states, adaptation capabilities, performance, and affective outcomes. While there is research addressing this topic in samples of teleworkers (Bélanger, Watson-Manheim, & Swan, 2013), this work does not consider team-level implications. Moving forward, a challenge will be identifying which methodologies are best able to capture the construct of mobility. Lastly, with regard to inputs, are there different member competencies needed for mobile work, and what technologies best support these work arrangements? In sum, furthering our understanding of how member mobility shapes VT success remains a critical question for research.

Research Opportunity 6—Subgroups

Subgroups can affect team success and failure and have received a great deal of attention in the broader team literature (e.g., Carton & Cummings, 2012). While theoretical work has discussed the implications of subgroups in VTs (e.g., Cramton & Hinds, 2005), empirical

work has not yet picked up this lead. This lack of attention is curious, given that VTs are frequently composed of members grouped in different geographic locations—a fact that is likely to contribute to the development of subgroups.

Theoretically, and in terms of inputs and processes, it is easy to posit that within VTs, subgroups may be activated and that the subgroup boundaries may become salient as a consequence of identity-based, resource-based, and knowledge-based differences between members (Carton & Cummings, 2012). In addition, subgroups may be activated as a result of other team structures and processes, which are especially likely in the context of VTs—geographical dispersion, task type, work practices, culture, multiple team memberships, communication technology, leadership, and power dynamics. If conditions are ripe for subgroups to form in VTs, then it is important that research start to examine how, when, and the implications of such groupings on VT processes, emergent states, and outcomes.

Moreover, the few studies that have examined subgroups have tended to suggest that they have a negative impact on team dynamics and outcomes. Polzer, Crisp, Jarvenpaa, and Kim (2006) found increased conflict and less trust within geographically distant student subgroups. Similarly, a qualitative study by Newell, David, and Chand (2007) documented problems of trust between sites of globally distributed teams. Finally, results by O’Leary and Mortensen (2010) suggest that subgroups weaken identification, create conflict, and impair team coordination. However, these results may not be representing the full story since research has not considered the conditions under which subgroups can result in enhancements to process and performance, as has been evidenced within traditional teams (e.g., Mathieu et al., 2008).

Research Opportunity 7—Team Adaptation

Teams are often used in dynamic environments that require adaptation and change. The topic of adaptation has become prominent within the broader team literature (Baard et al., 2014). While most teams face some sort of disruption or interruption that results in the need for adaptation, the *triggers* may be more likely within VTs, given their dynamic and often uncertain nature. Because of their more porous boundaries and greater fluidity of membership (e.g., Wageman, Gardner, & Mortensen, 2012), adaptation should be critical to VT success. In addition, VT members may need to adapt their behavior as a result of cross-cultural compositional factors (Anawati & Craig 2006). Cross-cultural adaptations become more complex depending on the numerical proportion of team members from different national cultures and virtuality (Zhang, Lowry, Zhou, & Fu, 2007). Lastly, there is the need for VTs to adapt their technology (Qureshi & Vogel, 2001) to ensure it continues to meet the team’s needs.

Accordingly, while it appears that the topic of adaptation is extremely salient to VTs, over the course of the last 10 years, it has not been considered extensively within the literature. Early research suggested that VTs were more task focused and often struggled or took a longer time to handle relationship issues (Martins et al., 2004). For adaptation, this focus on task may be beneficial, suggesting that in times of rapid change, VTs may be better poised to handle adaptation. Currently, team theories underpin most of the work on VTs. However, adaptation may be a topic where virtuality serves to drive practice as well as research in both the VT and broader organizational team literatures.

Research Opportunity 8—Transition Processes and Planning

VTs are often described as short-term project teams that come together to address a specific problem and disband upon its completion (e.g., Powell, Piccoli, & Ives, 2004). Given this, planning for how the team will work together both from a process and outcome standpoint should be paramount. Therefore, it is surprising that planning and strategy formulation have received only limited attention within the VT literature. While research has considered both the action and interpersonal processes extensively, the area of transition processes has largely been ignored. Accordingly, we note that unpacking the impact of various transition processes presents a significant opportunity. There is some evidence to suggest that planning activities are beneficial within VTs (e.g., Bosch-Sijtsema, Fruchter, Vartiainen, & Ruohomaki, 2011; Maynard et al., 2012). However, to date, work on transition processes has mainly focused on goal setting and the resulting benefits associated with allocating time to arriving at goals (e.g., Brahm & Kunze, 2012; Forester et al., 2007; Quigley et al., 2007).

Moving forward, team charters are a form of planning that, theoretically, should be important within a virtual context (Mathieu & Rapp, 2009). Here, questions abound as to who should be involved in developing the charter, how technology can best be leveraged for this task, and what the effects of said charters are on members' task commitment, as well as team processes, and outcomes. Studies on VT charters could compare planning at different project stages and at different times as well as the effects of planning when performed by individual members, subgroups, or the team as a whole. Furthermore, how might the various dimensions of virtuality interact with transition processes? Taken together, we posit that transition processes may hold a great deal of explanatory power regarding team virtuality and may help to tease apart some of the mixed performance results evidenced in studies of VTs.

Research Opportunity 9—Creativity

In today's complex, fast-paced, competitive work environment, creativity is regarded as critical for team and organizational success. A basic premise in the creativity literature has been that diversity and divergent thinking are necessary for creativity to ensue. However, getting diverse teams to work together has always been a challenge (Mathieu et al., 2008), but having people work virtually has been touted as a means to harness diversity and increase creativity (e.g., Zakaria et al., 2004). Using a sample of master of business administration student teams, Martins and Shalley (2011) found that the relationship between demographic diversity and team creativity was very complex. For instance, differences in age, sex, and race were not directly related to team creativity. Nationality diversity had a strong negative effect on creativity when there were differences in technical experience. However, for age, diversity had a positive association with creativity when there was high rapport and equal participation but a negative relationship when there was high process conflict or a larger difference in technical experience between team members. While these results are interesting, they are certainly nuanced and in need of replication before we can truly understand whether working virtually allows teams to better leverage diversity for increased creativity.

In addition to the ability to leverage the best people regardless of location, working virtually has been theorized to facilitate creativity because it allows team members to contribute ideas and suggestions with less fear of repercussion or potentially looking foolish. In an in-depth qualitative analysis of communication transcripts, Ocker (2005) found that creativity

was inhibited by the dominance of some members, downward norm setting, lack of shared understanding, time pressure, and technical difficulties. In contrast, creativity was enhanced by social influence and a collaborative team climate. As with diversity, these results are a great starting point for future research to examine how team virtuality affects creativity.

With regard to communication technology, early VT research proposed that initial FtF meetings should help facilitate performance (Geber, 1995). Han and colleagues (2011) extended this line of reasoning to creativity and compared modes of initial communication to assess the impact of initial media richness. Using teams composed of members from different countries, they found there were no differences in creativity regardless of the type of medium used for initial short meetings or when the team subsequently communicated via asynchronous text. While this study presents some interesting findings with regard to initial meetings, it does not address questions related to media richness or virtuality. With so many technologies available to teams, are there some that are better suited for idea generation or engagement in the creative processes? Given that creativity unfolds over time (Gilson, Lim, Litchfield, & Gilson, in press), are there some CMCs that are better early rather than late in the creative process? For creative processes to ensue, ideas need to be generated before they can be evaluated, screened, or selected (Amabile, 1996). As such, how do these steps align with various CMCs and what we know about VT processes? While team creativity has recently started to receive a fair amount of research attention (Gilson et al.), we still know relatively little about creativity in VTs.

Research Opportunity 10—Team Member Well-Being

Across the VT literature, team member well-being has been discussed as being theoretically important in shaping member affect and performance, given that members are often dispersed, work alone on a shared project, and may be unfamiliar with others on their team. However, there has been limited research on the topic of well-being and whether well-being is positively or negatively affected by working virtually. For instance, some VT members may feel a sense of isolation and loneliness, whereas others might relish the higher levels of autonomy and independence. This pattern of results has been found in research on telecommunicating (e.g., Bélanger et al., 2013) but, to date, has not been extensively integrated into work on VTs.

With regard to well-being, researchers need to consider that CMC can be emotionally charged and used to display both anger and happiness depending on the content as well as the interpretation (Cheshin, Rafaeli, & Bos, 2012). Within VTs, frequent use of CMC has been found to lower levels of positive affect among members (Johnson, Bettenhausen, & Gibbons, 2009). Likewise, satisfaction research has considered CMC type (e.g., Caballer et al., 2005); however, links to overall well-being have not been considered. In our literature review, we found one multiple-case study of global teams where it was reported that low visibility and awareness of local conditions, low access to information, and the lack of clarity in communication all resulted in psychological strain and overload for VT members (Nurmi, 2011).

As a result of the theorized salient role that well-being may play within VTs and the absence of empirical considerations of the topic, we echo the sentiments of Fineman, Maitlis, and Panteli (2007) who called for research to consider how emotions are constructed, modified, or suppressed within VT environments. A possible starting point might be to consider

the work engagement framework. This framework posits that engagement results in a positive state of mind characterized by vigor, dedication, and absorption, which ultimately drives performance (Bakker & Demerouti, 2008). Would the same engagement–state of mind–performance relationships hold in VTs, and how would virtuality affect the various associations? More specifically, does well-being influence, mediate, or moderate how VT members interact with each other and subsequently perform as a unit?

Likewise, we propose that this research opportunity could be partnered with some of the other directions noted. For example, does the presence of subgroups affect well-being and if so, how? Can the adoption of newer technologies (i.e., social media) benefit member's well-being by increasing virtual presence? Mobile technologies allow employees to work evenings, weekends, and during vacations (Towers, Duxbury, & Higgins, 2006), which can be a double-edged sword that suggests benefits with regard to productivity but underestimates the strain that workers may experience when always at work (Axtell, Hislop, & Whittaker, 2008). Finally, given that well-being is likely shaped by both individual- and team-level factors, this topic also could be examined through a multilevel longitudinal lens.

Conclusion

Recently, it has been noted that organizational teams are evolving (e.g., Wageman et al., 2012), and after reviewing the last decade of research, we contend that this is certainly true for VTs. Within the domain of VTs, technological advancements continue to change the way team members interact and enable those individuals who previously could not be connected to work together as a team. Accordingly, VTs provide great promise to organizations. Simultaneously, the topic of VTs within academic research has gained in prominence. Although when Martins and colleagues reviewed the literature in 2004, empirical work on VTs was “in its infancy” (823), this is no longer the case. In response, we have outlined 10 key themes that have emerged within the VT literature over the past 10 years. Likewise, we detailed 10 promising opportunities for future research in the hope that our suggestions will demonstrate that while much is known, there continues to be great promise in the use of VTs and great opportunity to learn more. We look forward to the continued evolution of this literature stream over the years to come.

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