LEADERSHIP IN SELF-MANAGING VIRTUAL TEAMS

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ABSTRACT

Self-managing virtual teams are becoming commonplace and they embody several unique dynamics. Virtual team leadership literature tends to borrow heavily from organizational theory, which has considered some of these different dynamics and developed distinct and non-overlapping leadership theories for them. In this conceptual article, we integrate these different theories in a coherent whole to explain how leadership contributes to team formation, continuing change, and transformation in self-managing virtual teams. Building on the virtual team literature, leadership theory, and structuration theory, we present a theory of leadership in self-managing virtual teams that describes leadership as a process that results in the reinforcement, creation and evolution of ongoing structures. We further distinguish between two types of leadership that empirical research suggests jointly influence team process and structures in these types of teams. We identify first-order leadership as leadership that works within and reinforces existing structures to elicit and guide group contributions. We identify second-order leadership as leadership that results in changes in the structure that guides group action. We argue that second-order leadership is enabled by first-order leadership, is action-based, and is enabled by substantive team member contributions. We propose that effective self-managing virtual teams will exhibit a paradoxical combination of shared, distributed first-order leadership complemented by strong, concentrated, and centralized second-order leadership.

Keywords: Self-managing teams, virtual teams, structuration theory, leadership

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In this conceptual article, we are developing leadership theory for self-managing virtual teams. Many organizations depend on self-managing teams to provide the adaptive and flexible responses necessary in today's environment (Maynard, Mathieu, Rapp, & Gilson, 2012). Virtual teams are commonly employed in organizations to connect expertise distributed across space and time, to create flexibility in staffing, to meet market demands, and to reduce travel costs (Hoch & Kozlowski, 2014). Consequently, self-managing virtual teams, which combine the benefits of both types of teams, have been pervasive (Lim, 2018). In a recent conceptual work related to teams research, Mesmer-Magnus et al. (2016) suggested that team work is sociomaterial, and that we should investigate how technology enables teamwork and how we can maintain effective team performance through technology. Self-managing virtual teams embody several uniquely different dynamics compared to organizational teams; For example, power distribution, authority and ownership are distributed within the team through a shared leadership model with members holding collective responsibility for project outcomes (Magpili & Pazos, 2018; Yang & Guy, 2011). Virtual team leadership literature tends to borrow heavily from organizational theory, which has considered some of these different dynamics and developed distinct leadership models: for example, action-embedded transformational leadership theory (Eseryel & Eseryel, 2013) is a unique adaptation of transformational leadership theory (Bass, 1985) to the virtual team setting. There are different theories for when the leadership is emergent (Carnabuci, Emery, & Brinberg, 2018; Hoch & Dulebohn, 2017), or shared (Hoch & Kozlowski, 2014), or when there were assigned leaders (Sharma & Kirkman, 2015; Morgeson, DeRue & Karam, 2010), but no theory that can apply directly to self-managing virtual teams, which tend to have both emergent and shared leadership, with or without external leaders. Other theories suggest that

leaders may have either transactional or transformational approach, assuming that leaders may use only one approach and this approach stays static throughout the lifecycle of the team. However, it is not clear how leaders may contribute differently at different stages of a team's lifecycle from team formation, team development (minor changes) and major, transformational team changes. Yet, many teams go through these stages. Finally, in much of the organizational leadership literature, the leader is positioned as the individual who develops strategies and motivates others to do the work. Self-managing virtual teams are typically action-oriented, where contribution to the team's work is crucial part of leadership (Eseryel & Eseryel, 2013), and where the leaders do not have the luxury of only focusing on strategy, motivation and task coordination. Therefore, we consider all of these factors in combining distinct leadership theories as explained in detail in the following sections.

Virtual teams are a new way of organizing and working that allow organization to bridge discontinuities of time and geography and to leverage human and intellectual capital wherever it resides globally (Duarte & Snyder, 2001). Unlike conventional co-located teams whose members work in relatively close proximity and interact regularly face-to-face, members of virtual teams are geographically and often organizationally or culturally separated (Watson-Manheim, Chudoba, & Crowston, 2002) and rely primarily or exclusively on technology mediation to bridge these discontinuities. This reliance on technology influences how leadership manifests in virtual teams as opposed to face-to-face teams as explained in the literature below.

In their review of leadership theory, Avolio and colleagues (2009) suggest that leadership processes in virtual teams differ from those in co-located teams as the discontinuities in the technology-mediated environment in which virtual teams interact challenges traditional (i.e., hierarchical, top-down) forms of leadership. Virtual teamwork is characterized by "behavioral

invisibility" (Bass, 2008) meaning that appointed leaders cannot easily observe team member behavior, making it difficult for them to manage team task and social dynamics. Team process is difficult to moderate because of the reduction in social interaction. Traditional forms of social control such as direct supervision, physical proximity, and shared experiences are largely absent (Pinsonneault & Caya, 2005). Finally, opportunities to give and to receive feedback are reduced, as are opportunities to assess perceived commitment to project or team goals (Konradt & Hoch, 2007).

We focus here on the nature of leadership in self-managing virtual teams since virtual teams often are self-managing. Leadership structures observed in virtual teams may include permanent leaders, rotating leaders, managing partners, structures in which facilitators or coordinators assist teams in completing their work, as well as leaderless (self-managing) structures (Beyerlein, Nemiro, & Beyerlein, 2008). However, the literature suggests that virtual teams are more likely to be self-managing regardless of whether a formal leader is appointed (Matheiu, Maynard, Rapp, & Gilson, 2008). Self-managing teams have been the focus of some theorizing and empirical inquiry. However, the theorizing work for self-managing teams has focused on the dynamics of self-management in co-located teams (Bell & Kozlowski, 2002; Hertel, Geister, & Kondradt, 2005; Matheiu et al., 2008). Andres (2006) suggests that the underlying dynamics by which self-managing leadership structures emerge will differ in virtual teams because of the discontinuities present in the virtual environment that impact all forms of leadership structures and dynamics. Accordingly, we argue that when teams exhibit high levels of both virtuality and self-management, their leadership dynamics will not be explained by traditional leadership theories, theories largely designed to explain interactions between

subordinates and a single individual who occupies a formal, appointed managerial or supervisory position in a hierarchical organizational setting (House & Aditya, 1997).

The purpose of this paper is to develop a theory of leadership in self-managing virtual teams, where majority of teamwork is done and coordinated virtually, and there are no internal or external formal leaders and no formal hierarchy. For our theorizing, we integrate several streams of non-overlapping leadership theories from the management literature and the virtual team literature from the management information systems field, using the meta-theory of structuration to integrate these theories together.

THEORETICAL & CONCEPTUAL BACKGROUND

In this section, we review the three streams of leadership literature on which we base our theory: (1) the existing literature on virtual team leadership, (2) the literature on leadership in self-managing teams, and (3) the shared leadership literature. The literature on leadership is voluminous, so we necessarily focus our review on the subset of the literature most relevant to our theorizing; Northouse (2018) provides a complete picture of the literature on team leadership. We use structuration theory as a meta-theory to integrate these steams of literature into a theoretical framework that focuses explicitly on leadership dynamics in self-managing virtual teams.

Leadership in Virtual Teams

The growing literature on virtual teams suggests that collaborating in virtual environments introduces discontinuities into the interactions of team members such that leadership in virtual settings differs from leadership in co-located organizational settings (Avolio et al., 2009; Bell & Kozlowski, 2002; Cascio & Shurygailo, 2003; Mathieu et al., 2008; Yoo & Alavi, 2004; Zigurs, 2003). Typically, the leadership research, even investigations of leadership

in virtual teams, has focused on the interaction between a single, appointed internal or external leader and other team members (Bass, 2008; Yukl, 2006).

Accordingly, research on leadership in virtual teams has most often adopted theoretical frameworks developed to investigate leadership dynamics in co-located rather than virtual teams. The majority of studies have been either implicitly or explicitly informed by functional behavioral leadership theories (D. L. Cogburn, L. Zhang, & M. Khothule, 2002; Kayworth & Leidner, 2002; Misiolek & Heckman, 2005a; S. Sarker, Grewal, & Sarker, 2002; Sudweeks & Simoff, 2005; Tyran, Tyran, & Shepherd, 2003; Weisband, 2002; Yoo & Alavi, 2004) that focus on the behavioral styles, orientations, or patterns that leaders manifest (Denison, Hooijberg, & Quinn, 1995; Hooijberg, Hunt, & Dodge, 1997; Lord, 1977).

In particular, the two-factor theory that underlies the functional theory of team leadership has been the predominant theoretical framework. Derived from Bales' (1950) work on small group dynamics, this theoretical perspective suggests that leaders engage in both task-oriented and relationship-oriented behaviors. Task-oriented behaviors are those that move the team forward in the accomplishment of its task, such as scheduling and planning work, initiating activity, coordinating subordinate activities, elaborating, problem-solving, proposing solutions, removing barriers or providing resources, providing feedback, and providing, elaborating, or summarizing information (Yukl, 2002, p. 53). Relationship-oriented behaviors are those that allow the team to maintain a positive psycho-social dynamic, such as gate-keeping, showing trust and confidence, expressing group emotion, conflict resolution, maintaining a positive atmosphere, sowing concern for others, expressing gratitude, keeping subordinates informed, and providing recognition for subordinates' accomplishment (Yukl, 2002, p. 53).

Subsequent research on leadership in co-located teams guided by this perspective has focused on identifying those task- and relationship-oriented behaviors that distinguish leaders from non-leaders in teams (Bass, 2008; Yukl, 2006). This analytic approach has also been adopted in studies of virtual team leadership based on this theoretical perspective. Empirical research investigating leadership dynamics in virtual teams suggests that these teams evolve leadership structures that differ from conventional, single-leader, hierarchical structures, and that leadership dynamics differ in virtual teams (Balthazard, Waldman, Howell, & Atwater, 2004; Carte et al., 2006; Cogburn et al., 2002; Connaughton & Daly, 2004; Hoyt & Blaskovich, 2003; Kayworth & Leidner, 2002; Misiolek & Heckman, 2005; Nicholson, Sarker, & Sarker 2002; Pauleen, 2003, 2004; Pearce, Yoo, & Alavi, 2003; Piccoli & Ives, 2000; Piccoli, Powell, & Ives, 2004; Sarker et al., 2002; Sarker, Sarker, & Schneider, 2009; Sudweeks & Simoff, 2005; Tyran et al., 2003; Weisband, 2002; Wickham & Walther, 2007; Yoo & Alavi, 2004).

Typically, in these investigations, individuals are assigned to teams and required to complete a task that may range in duration from a week to several months. In some of these studies, a team member was appointed as the team leader at the outset. In others, no team member was appointed as the team leader. Once teams had completed their tasks, team members were asked to identify who the team leader(s) had been. While some teams evolved a leadership structure in which a single team member emerged who was recognized by others as the team's leader, other teams evolved less centralized leadership, interaction, influence, and participation patterns. In the latter case, no single individual or core group of individuals was identified as the team leader(s). Even in studies in which a team member was appointed as the team's leader at the outset, individuals within the team other than the appointed leader were identified by other team members as having performed leadership roles (Kayworth & Leidner, 2002; Weisband, 2002):

- Leadership in virtual teams is often ***emergent***. Evidence from empirical studies of virtual team leadership suggests that, whether or not a leader is appointed, virtual teams *evolve* leadership structures based on the interactions of team members (Jarvenpaa & Leidner, 1999; Kayworth & Leidner, 2002; Misiolek & Heckman, 2005; Weisband, 2002; Wickham & Walther, 2007; Yoo & Alavi, 2004). Northouse (2018) defines emergent leadership as being a process-based phenomenon resulting from continued interaction among organizational or team members:

  > *When an individual is perceived by others as the most influential member of a group or organization, regardless of the individual's title, the person is exhibiting emergent leadership. The individual acquires leadership through people in the organization who support and accept that individual's behavior. This type of leadership is not assigned by position, but rather emerges over a period of time through communication.* (p. 5)

  In the absence of a formal or appointed leader, the literature suggests that different leadership structures evolve within virtual teams (D.L. Cogburn, L. Zhang, & M. Khothule, 2002; Misiolek & Heckman, 2005b; Piccoli, Powell, & Ives, 2004). Some teams evolve a leadership structure in which one or two emergent leaders take the initiative to structure and guide the teams' work. Others evolve a more distributed structure in which the leadership of the team is shared by its members (e.g., Misiolek & Heckman, 2005b; Yoo & Alavi, 2004). As was noted above, leaders emerge in the presence and in the absence of appointed virtual team leaders.
- Leadership attributions are ***perceptual***. While status, power, or hierarchical position within an organization often are associated with leadership attributions in co-located teams, these cues are absent in virtual teams. While it is possible in co-located team environments to rely

on external cues based on personal characteristics and interaction style on which to base leadership attributions, those cues are largely absent in virtual team environments. Instead, the literature suggests that leadership attributions are made on the basis of observed behaviors: the team leader (or leaders) are those individuals who are *perceived* by team members as having performed a leadership function within the team (Misiolek & Heckman, 2005; Sarker et al., 2002; Weisband, 2002; Yoo &Alavi, 2004). The following behaviors have been consistently associated with being identified as a virtual team leader: quantity of communication, initiation of communication, and communication content (Jarvenpaa, Knoll, & Leidner, 1998; Jarvenpaa & Leidner, 1999; Misiolek & Heckman, 2005; Piccoli et al., 2004; Sudweeks & Simoff, 2005; Tyran et al., 2003; Yoo & Alavi, 2004). Pescosolido (2002) and Hart and McLeod (2003) find that emergent leaders increase their task-oriented communication in order to reduce ambiguity, provide direction, and move the work of the team forward. This suggestion is in accord with Jarvenpaa and colleagues' (1998; 1999) observations concerning the relationship between communication content and the team lifecycle which suggest that social exchanges establish "thick" relationships among virtual team members as long as social exchange does not detract from the team's task focus. Communication content is valuable in that it is how leaders share knowledge either in the form of technical knowledge, expert opinion or procedural knowledge (Faraj, Kudaravalli, & Wasko, 2015). Most recently, it is also shown that beyond communication, individuals' work contribute to leadership perceptions in virtual teams (Eseryel & Eseryel, 2013; Faraj et al., 2015). This point is discussed specifically below.

- Leadership in virtual teams are often ***action-based*** (cite action-embedded leadership), meaning the contribution to the team's work appear to be the basis for leadership attributions

on the part of team members in virtual teams (Eseryel & Eseryel, 2013). The reduction in social cues and in social interaction within virtual teams appears to shift the basis for leadership attributions to action-based competencies and contributions (Carte et al., 2006; Misiolek & Heckman, 2005; Yoo &Alavi, 2004). A study on patterns of emergent leadership in virtual teams tentatively suggested that virtual teams may evolve either centralized or shared leadership structure depending on the contributions of team members to the process of completing a task as well as their contributions to the substance of the task (Misiolek & Heckman, 2005). Eseryel and Eseryel (2013) found that in virtual information systems development teams, the action-based leaders provide leadership that influence the team's vision and strategy for technology development by "significantly contributing to the software development effort" "over long periods of time" (p.109). Faraj et al. (2015) further supported this study's findings by showing that individuals perceived as leaders contribute to knowledge by providing software code, meaning they contribute to the software development by doing work, not only by providing technical knowledge and guidance. This is uniquely different than what traditional leadership theory stated for co-located teams where leaders influence vision and strategy through communicating a certain vision or strategy, rather than by doing work, which achieves a vision and strategy piece by piece over long periods of time.

While the studies from which these conclusions are drawn are informative, they also share three significant limitations: (1) often, the teams studied remained stable throughout the short duration of the studies, (2) in most studies, the tasks were relatively short-term in nature, ranging

from 2 to 15 weeks, and (3) the broad distinctions between task- and relationship-oriented communication may not capture more subtle leadership dynamics suggested by the literature. With respect to the third of these limitations, in virtual teams where members make diverse knowledge contributions, Misiolek & Heckman (2005b) found it useful to distinguish between two types of task roles, *task coordination* and *substantive task contribution*. Task coordination behaviors are those involved in organizing and directing the team's work (*e.g.,* scheduling, dividing labor, creating processes) while substantive task contributions are those that actually accomplish the team's work (*e.g.,* idea generation, evaluation, synthesis). Thus, leaders may exercise their influence by means of their substantive expertise as well as through their coordinating and directing activities. Eseryel and Eseryel (2013) took the concept of substantive task contribution one step further by considering "doing work" ask substantive contribution.

Despite the limitations noted, this body of literature provides evidence that the basic assumptions about the nature of leaders underlying much of "traditional" leadership theory (e.g., trait and new leadership theory, contingency and situational leadership theories, social exchange and strategic contingency theories, and leader-member exchange theories) need to be reconsidered for their applicability to leadership in the virtual team setting. Leadership emergence within teams has been the subject of inquiry within primarily four steams of "traditional" leadership theory: trait and new leadership theory, contingency and situational leadership theories, the literature on leadership in self-managing teams, the literature on shared leadership, and behavioral leadership theory. Only the latter three steams of literature implicitly or explicitly acknowledge that emergent leadership can take different forms such as centralized forms in which a single member emerges who is recognized by others as the team's leader, or less-centralized forms in which leadership is shared among team members, as suggested by the

evidence on virtual team leadership. These possible outcomes are consistent with the literature on self-managing teams, as well as that subset of the leadership literature focusing on shared leadership. Further, the evidence suggests that the basis for leadership attributions lies in the observed behaviors of team members rather than in formal status within hierarchical organizational structures, reinforcing the notion that leadership is an inherently behaviorally-based phenomenon, as suggested by behavioral leadership theory as well.

Leadership in Self-Managing Teams

A self-managing team is a group of individuals with diverse skills and knowledge with the collective autonomy and responsibility to plan, manage, and execute tasks interdependently to attain a common goal (Magpili & Pazos, 2018, p. 4). In self-managing teams, power is distributed among tea members where leadership is shred and all members are collectively responsible for project success (Magpili & Pazos, 2018; Yang & Guy, 2011). Although these definitions may appear to suggest that self-managing teams are "leaderless" in that formal leadership is absent, this is not necessarily the case. Since empowering the team to lead itself has challenges, external leaders are typically utilized to facilitate and develop team motivation and ability of members to lead themselves (Rapp, Gilson, Mathieu, & Ruddy, 2016).

Self-managing teams range from teams embedded within formal organizational hierarchies in which a formal leader is appointed by upper-level management to serve as the team's "leader" who is not a regular member of the team to loosely configured groups of individuals who come together to discuss or solve some issue or problem of interest to the group as is frequently seen in community-based organizing or in Internet-based groups such as open source software development teams. As such, self-management can be thought of as a continuum rather than as a state (Offerman & Scuderi, 2007).

Much of the empirical research in this area has focused on the conditions under which self-managing teams with designated team leaders (or managers) embedded within organizational hierarchies become fully self-managing (Druskat & Wheeler, 2003; Stewart & Manz, 1995; Stoker, 2007; Wageman, 2001). However, Pearce and Sims (2002) note that the literature on self-managing teams does recognize that team members can and do perform leadership roles that had previously been the performed by managers. Wageman (2001) notes that self-management is a behavioral process, in which self-managing teams are given the authority to execute work and to monitor and manage work processes, for both of which they are held accountable. Specification of team goals and objectives and team structure are assumed to be outside the domain of self-managing teams. Within this context, team effectiveness is considered to have three dimensions similar to those that have been investigated in the traditional leadership literature: (1) task performance, (2) group process, and (3) individual satisfaction (Wageman, 2001, p. 560).

The degree to which specification of team goals and objectives and determination of team structure are outside the domain of team members may be a function of the type of organizational context in which the teams are embedded. As technology facilitates the development of new means of interacting and organizing, the degree to which these domains are integrated within the scope of teams' domains may change. As represented on a continuum of self-management, self-managing virtual teams that interact primarily or exclusively via technology-mediation may take responsibility for determining goals and objectives as well as structure. External leadership may be in fact non-existent, or in the presence of the discontinuities present in the virtual environment, may be ineffective in providing this type of direction.

Other research has examined factors that contribute to the success of self-managing teams. Depending on the context in which team members interact, the literature on self-managing teams suggests that the development of shared mental models may be a critical component affecting team process and outcomes. Druskat and Pescosolido (2002) argue that it is critical that self-managing work teams develop shared mental models, which they define as "cognitive theories about how the system operates that underlie behavioral team process" (p. 285). Scozzi, Crowston, Eseryel, and Li (2008) investigated virtual teams that develop open source software and found many similarities in shared mental models of the core developers, although they also noted some differences. Based on their review of the published field, Druskat and Pescosolido (2002) propose that some shared mental models are more appropriate than others in self-managing teams. Specifically, they identify shared mental models of psychological ownership of team outcomes and processes that support continuous learning, and that promote heedful interaction as underlying success in terms of team process and outcomes. However, the authors also note that shared mental models of task and equipment may also influence teamwork, though these have not been examined in the literature.

Cohen and colleagues (1997) suggest that degree of team member involvement is the strongest predictor of team effectiveness, and that managerial, or supervisory, behaviors performed by formal, appointed team leaders are ineffective in self-managing teams. The implication of their findings is that a focus exclusively on external leadership may not adequately capture the team's internal and emergent leadership dynamics. Yang and Shao (1996) identify shared leadership as an outcome of effective self-management in teams. In research focusing on emergent leadership in self-managing virtual teams, Carte and colleagues (2006) suggest that the members of successful self-managing virtual teams exhibit a combination of shared individual

and collective emergent leadership behaviors. Specifically, higher performing teams engaged in significantly more concentrated behaviors oriented toward performance and more shared behaviors focused on process (i.e., keeping track of the team's work) than lower performing teams.

On the whole, the literature on self-managing teams reinforces the notion that leadership is both shared and emergent in these types of teams (Pearce & Manz, 2005). When external team leaders are appointed, their responsibilities are largely to facilitate (or mentor) rather than to direct the work of teams. The empirical finding also suggest that observed behaviors related to the process and the substance of the task are important factors related to team performance, as with virtual teams.

Shared Leadership

The final perspective we examine is shared leadership, defined by Pearce and Conger (2003b) as:

> A dynamic, interactive process among individuals in groups for which the objective is to lead one another to the achievement of group or organizational goals or both… (that) often involves peer, or lateral, influence and at other times involved upward or downward hierarchical influence (Pearce & Conger, 2003, p. 1).

This perspective, similar to the notion of distributed leadership (Gronn, 2002), conceptualizes leadership in terms of relational processes, shared phenomena occurring at different levels, and interdependencies among social networks or networks of influence (Fletcher & Kaufer, 2003, p. 21). It differs from conventional leadership theory by conceptualizing leadership as a group-level rather than an individual-level phenomenon. Fletcher and Kaufer (2003) note that in doing so it

creates an important theoretical link between leadership research and research on teams that has been largely absent in prior work.

Shared leadership research suggests that it is unlikely that a "single multirole leader" will emerge. Decades of research on small-team interactions supports the notion that different individuals perform different leadership roles as circumstances warrant. For example, Houghton and colleagues (2003) observed that when the task-oriented and social supportive-oriented leadership roles in small teams have been examined empirically, these leadership roles are often split between two or more individuals. They attribute this outcome to the tensions created when one individual attempts to fulfill both roles, noting that "the directive or task-oriented leader often creates tension within the group through the assignment of tasks…(and) may not be in the best position to fill the social supportive role of solving or soothing the problems created by the task-related tension" (Houghton et al., 2003, p. 126). Alternately, the split may be due to differing levels of expertise. For example, Klein and colleagues (2006) described how attending surgeons, fellows and residents dynamically shared leadership in a trauma care unit, as the surgeons routinely stepped back to allow fellows and residents to assume leadership roles.

Empirically, shared leadership is relatively unexplored area of inquiry (Pearce & Conger, 2003a; Pearce, Manz, & Sims, 2009; Wassenaar & Pearce, 2012). The few empirical investigations that have investigated shared leadership have examined it in organizational settings in which both vertical and shared leadership were present. For example, in Klein and colleagues' (2006) study of leadership in extreme action teams in an emergency medical center, attending surgeons formally outranked fellows and residents. Nevertheless, empirical research investigating the relationship between vertical and shared leadership and team effectiveness suggest that shared leadership is a useful predictor of performance (Ensley, Hmieleski, & Pearce,

2006; Pearce & Sims, 2002). Pearce and Sims (2002) investigated the relationship between vertical and shared leadership and effectiveness in 71 change management teams. Hierarchical regression analysis of the relative influence of vertical and shared leadership behaviors indicated that although vertical leadership explained a significant amount of the variance in self-ratings of team effectiveness, shared leadership behaviors accounted for more. Ensley and colleagues (2006) investigated the influence of shared versus vertical leadership in two samples of new venture top management teams on startup performance. Again, while both vertical and shared leadership were significant predictors of performance, shared leadership variables were found to account for a significant proportion of the variance in performance beyond that accounted for by vertical leadership alone in both samples.

In summary, the literature on shared leadership suggests that leadership can be a group-level phenomenon, and that shared leadership can co-exist within teams in which there are formal or assigned leaders. However, Wassenaar and Pearce (2012) do not rule out the possibility of "serial leadership emergence" in which teams demonstrate vertical or shared leadership depending on task demands over the course of a team's interactions. These authors note that "not all leadership roles are present or even necessary in shared leadership environments…. Some of these leadership roles can become more or less critical at certain times it the lifecycle of the team" (p. 378). While task-related leadership appears to predominate based on empirical examinations conducted to date, this possibility cannot be ruled out either theoretically or empirically.

Summary

The self-managing teams and shared leadership perspectives, and the results of empirical investigations of emergent leadership in virtual teams based on behavioral leadership theory,

suggest that leadership in teams can be both shared and emergent and that shared leadership can be an important contributor to team effectiveness. Behavioral leadership theory provides additional insights into the classes of leadership behavior that leaders in these types of teams manifest such as task-oriented and relationship-oriented behaviors, distinctions appear not to pertain to virtual team leadership based on the existing empirical literature. While behavioral leadership theory provides a framework for identifying classes of leadership behaviors, it falls short in explaining changes in leadership behaviors over time in response to changes in team composition and the environment. Existing theory and empirical research fail to explain how leadership behaviors enacted by individuals guide team interaction in self-managing virtual teams, and how structures for task performance and team interaction emerge in conjunction with ongoing interaction. Understanding these dynamics is the motivation for our theorizing.

MODEL DEVELOPMENT

To conceptualize the dynamic process by which individuals' actions can provide leadership in self-managing teams, we adopt a structurational perspective (Giddens, 1984).

Structuration theory posits a recursive relation between team structure (defined as the rules and resources that influence, guide or justify individual action) and the actions of those that live within, and that help to create and sustain, this structure (Figure 1). It is perhaps best described as a meta-theory; that is, rather than specifically describing particular factors of leadership or their relations, it describes the form that such a theory might take. Specifically, structuration theory suggests that a theory of leadership in self-managing virtual teams should consider structure and action in these teams and how the two are interrelated in different approaches to leadership (Bass, 2008). Numerous authors have used a structurational perspective to frame empirical analyses of team activities (e.g., Barley, 1986; DeSanctis & Jackson, 1994;

Newman & Robey, 1992; Orlikowski, 1992; Walsham, 1993) and in particular, the development of virtual teams (e.g., Suprateek Sarker, Lau, & Sahay, 2001). We chose this framework because it provides a way to conceptualize how the leadership behaviors of one team member might shape the actions of others, even in the absence of traditional modes of authority, a key issue in our theorizing about leadership in self-managing virtual teams.

----FIGURE 1 about here-----

In our work, we consider structure as comprising three kinds of rules and resources identified in prior work (Barley & Tolbert, 1997; Stein & Vandenbosch, 1996): (1) interpretive schema that create structures of signification, (2) authoritative and allocative resources that create structures of domination, and (3) norms and rules that create structures of legitimation. It should be noted that this division into three kinds of structure is an analytic convenience: in practice, they are overlapping and mutually reinforcing. For example, an individual team member may follow a set process for a task (an individual action) because that process is the accepted norm within the team (*i.e.*, because of a structure of legitimation).

Structure matters because the development of shared structure improves shared understandings among the team members, which improves effective contributions and thus the team performance (Scozzi et al., 2008). In this way, effective structure may serve as a substitute for conventional leadership in the way that it guides individuals' actions towards desired group outcomes. It is not a question of the presence or absence of structure, but rather its nature and the degree of agreement concerning existing structures among team members.

For example, without common interpretive schema (a shared structure of signification), individuals from different teams or backgrounds may interpret tasks differently based on their backgrounds, making collaboration and communication difficult (Dougherty, 1992). In the

absence of developed team norms (structures of legitimation), team members will draw on norms they have acquired in other settings to guide their actions, but these diverse norms may conflict. The tendency for individuals to interpret tasks according to their own perspectives is exacerbated when working in a virtual environment, with its more varied individual settings and less opportunity for informal discussion and mutual observation.

We turn now to the question of how structure is developed and the role of leaders and leadership in this development. The key notion here is the "duality of structure," meaning that the structural properties of a social system are seen as both the means and the ends of the practices that constitute the social system. As Sarason (1995) explains, in structuration theory:

> The central idea is that human actors or agents are both enabled and constrained by structures, yet these structures are the result of previous actions by agents. Structural properties of a social system consist of the rules and resources that human agents use in their everyday interaction. These rules and resources mediate human action, while at the same time they are reaffirmed through being used by human actors or agents. (p. 48).

Simply put, by doing things, we create the way to do things. According to the structuration perspective, repeatedly "doing things" reinforces scripts – "observable, recurrent activities and patterns of interaction" (Barley & Tolbert, 1997, p. 99). Because these scripts are enacted by all team members, they are more likely to become internalized and reinforce the developing structures. For example, the norm of using a particular process for a task is not a given, but rather is itself the outcome of prior actions by team members. By following the norm, members reinforce its legitimacy ("we always do it this way"); by taking different actions (*e.g.*, skipping a step because it is seen to be too time-consuming or using a different approach because the accepted approach seems unable to deal with important problems), they undermine its

legitimacy, perhaps eventually changing the norm. Indeed, as we argue, behaviors may be deliberately chosen for their effects on structure.

Figure 1, adapted from Barley and Tolbert (1997, p. 101), graphically summarizes the relationship between institution (which the authors use synonymously with structure) and action, and how both evolve over time. In this figure, the two bold horizontal lines represent "the temporal extensions of Giddens' two realms of social structure: institutions and action," while the "vertical arrows represent institutional constraints on action" and the diagonal arrows, "maintenance or modification of the institution through action" (p.100). For example, the influence of a team norm on a member to use a particular work process is represented by a downwards vertical arrow, while reinforcement or changes to the norm due to actions is represented by an upwards diagonal arrow. We use this model of action and structure as the basis for our theorizing about the nature of leadership in self-managing virtual teams.

Leadership in Self-Managing Virtual Teams

In this section, we develop an argument that leadership in self-managing virtual teams consists of behaviors that generate or reinforce structure (*i.e.*, the upwards diagonal arrows in Figure 1). While it might first appear that a consideration of leadership would be relevant primarily to an understanding of structures of domination, we propose that leadership in self-managing virtual teams is expressed through all three systems of structure: signification, domination and legitimation. We argue that self-managing virtual teams develop the full range of structure that then guides the actions of team members enabling them to overcome the challenges created by discontinuities. While all leaders likely help create structure that guides the actions of team members, we suggest that leaders in self-managing virtual teams exert influence through all three modalities of structure. Thus, we define leadership in this context as follows:

Leadership in self-managing virtual teams is a process that results in the creation, reinforcement, and ongoing evolution of team structures of signification, domination, and legitimation that guide the actions of team members.

If leadership in self-managing teams is a process that results in the reinforcement, creation and ongoing evolution of structures, how does this process operate? The structurational perspective suggests that some actions serve to reinforce existing structures, while others have the effect of creating and modifying structures. Although we acknowledge that the creation of structures may be influenced by the prior experiences, expectations, and beliefs of team members, our focus here is limited to the emergence of structures based on team member interactions. Based on our review of the empirical and theoretical literature, we suggest that task-based coordination contributions to the team will be more influential in developing these structures than other types of contributions as self-managing teams negotiate their virtual collaborative environments. We therefore propose:

Proposition 1: The structures of signification, domination, and legitimation that are created through interaction in self-managing virtual teams will be generated from the individual actions of team members, and specifically their action-based contributions.

Proposition 1a: Action-based contributions individual team members advance the development of structures of signification in self-managing virtual teams.

Proposition 1b: Process contributions (i.e., those related to the coordination of the team's work) advance the development of structures of legitimation in self-managing virtual teams.

Proposition 1c: Structures of domination emerge with continued team interaction and are subordinate to the development of structures of signification and legitimation in initial team interactions in self-managing virtual teams.

Relative to structures of signification, domination, and legitimation, these propositions suggest that self-managing virtual teams develop shared mental models early in their interactions concerning interpretive schemas and communication (signification), and norms and sanctions (legitimation). We propose that it is more important for self-managing virtual teams to develop structures of signification and legitimation early in their interaction because the literature suggests that task-focused behaviors are related to both perceived team effectiveness and performance (Burke, Stagl, Klein, Goodwin, Salas, & Halpin, 2006; Carte et al., 2006; Druskat & Pescosolido, 2002; Ensley & Pearce, 2001; Johnson & Lee, 2008; Misiolek & Heckman, 2005; Wageman, 1997). Structures of signification enable self-managing virtual teams to more quickly develop shared mental models concerning the substance (i.e., the "what") of the team's work. Structures of legitimation enable self-managing virtual teams to more quickly develop shared mental models concerning the process (i.e., the "how") of the team's work.

As discussed above, leaders of virtual teams may lack formal control over authoritative and allocative resources that produce structures of domination. Discontinuities in the virtual environment lessen the ability to influence via traditional sources of hierarchical power and attempts to exert influence via these means may be detrimental to team dynamics and performance (Bligh, Pearce, & Kohls, 2006; Erex, Lepine, & Helms, 2002; Hiller, Day, & Vance, 2006; Mathieu et al., 2008; Van der Vegt, de Jong, Bunderson, & Mollman, 2010; White & Smith, 2010). Further, as Barley and Tolbert (1997) point out, structures of domination do not necessarily equate to formal power to reward and sanction. Knowledge-based power, in the form

of specialized knowledge or expertise, can contribute to the development of structures of domination such as when the team is dependent on the specialized knowledge of a team member to assist in problem-solving. The need to leverage specialized knowledge may not be apparent at the outset of a team's interactions but may become apparent later on.

We distinguish between two orders of leadership that emerge with team interaction in self-managing virtual teams: one that influences behavior while maintaining or reinforcing existing structures (first-order leadership) and one that works by modifying team structures (second-order leadership).

First-order leadership is predominantly functional and operates within and reinforces existing structures of signification and legitimation. Second-order leadership is predominantly transformational and operates to modify or transform structures of signification and legitimation. The distinction we draw between first-order and second-order leadership is intended to parallel the distinction between single-loop and double-loop learning as proposed by Argyris and Schön (1978), and the distinction between first-order and second-order change as described by Watzlawick and colleagues (1974). We next discuss how we define first- and second-order leadership, the patterns that are likely to emerge in self-managing virtual teams, and which patterns are more likely to be associated with successful task performance.

---- FIGURE 2 about here----

First-order leadership

We define first-order leadership behavior that influences other team members to make effective contributions to the team task, while working within and reinforcing existing structures of signification, domination and legitimation that emerge during initial team interactions (Figure 2). Behavioral theories of leadership have identified four classes of leadership behaviors that we

view as associated with first-order leadership: (1) task coordination/process; (2) action-based leadership advancing team's work; (3) group maintenance; and (4) boundary-spanning. Stewart and Manz (1995) identify similar leadership behaviors as those associated the most significant long-term improvements in self-managing teams. These behaviors are especially important in self-managing virtual teams in which members decide for themselves what they will do (and not do), based on discussion with other members and observation of what they are doing (and not doing). In order to be able to contribute effectively in self-managing virtual teams, team members must share ideas about what is important to the team, the kinds of actions that are appropriate or necessary, and what resources will be available and to whom. In other words, team members must draw on shared structures of signification, domination and legitimation. As team members work in ways that also draw on these structures, they make them visible, reinforce them and by increasing their effect on the behavior of other members, improve the functioning of the team. We argue that these leadership behaviors provide first-order leadership when they work in the context of existing structures, drawing on them as resources to guide, legitimize, enable, and give meaning to these behaviors.

How might first-order leadership be exhibited in a self-managing virtual team? Research has documented that different teams faced with similar contextual and task demands often evolve very different role and leadership structures, and work practices (Abdul Karim & Heckman, 2005; Brown & Eisenhardt, 1997; Misiolek & Heckman, 2005b). For example, in one study, self-managing teams working on identical tasks within a controlled context developed very different leadership structures, some highly centralized with one or two strong leaders performing leadership behaviors, and others highly decentralized with leadership behaviors widely distributed, or shared, among team members (Misiolek & Heckman, 2005b).

We propose that effective self-managing virtual teams develop shared first-order leadership during the creation and reinforcement of shared structures. Our rationale for doing so is three-fold. First, research on face-to-face teams (e.g., Bales, 1950; Yukl, 2002) suggests that the same individual is unlikely to perform all four functional leadership roles equally well. Second, teams that attempt to integrate diverse, specialized knowledge workers may require many different kinds of first-order leadership in the form of substantive task contribution (Grant, 1996). Finally, we suggest that the presence of a leadership structure that incorporates both vertical and shared leadership implies the presence of distributed first-order leadership. Consistent with this view, in an empirical study, Taggar and colleagues (1999) found higher performance in groups where leaders and members both exhibit high levels of leadership. In short, the nature of work in self-managing virtual teams creates a pressure for shared first-order leadership. We thus offer the following propositions:

Proposition 2: First-order leadership is more likely to be fluid, shared, and emergent in effective self-managing virtual teams.

Proposition 2a: Shared, emergent, and fluid first order leadership will be more effective than centralized first-order leadership in reinforcing structures of signification, legitimation, and domination.

Note that this proposition does not preclude the emergence of centralized first-order leadership. The emphasis is on the linkage between the type of first-order leadership that emerges from team interaction and its linkage with team effectiveness. We suggest that distributed first-order leadership serves to reinforce scripts that characterize work in virtual team environments (Barley & Tolbert, 1997). Because these scripts are enacted by all team members, they are more likely to become internalized and reinforce the developing structures.

Second-order Leadership

We define second-order leadership as transformational leadership behavior that result in modifications to the structures of signification, domination and legitimation and, thus the way that team members work. While first-order leadership influences team member behavior through the reinforcement of these structures, second-order leadership effects change in the structures. Second-order leaders help other team members make sense of the world in different ways and to develop new norms of behavior and new processes to match changing needs over time. The literature on leadership dynamics in self-managing co-located teams suggests that the development or modification of structures that guide team members' interactions facilitates the work of these teams (Johnson & Lee, 2008), although this has not been investigated in self-managing virtual teams. For example, Foldy and colleagues (2008) discussed how a leader was able to help members of an organization understand an important element of the organization's work, and Taggar and Ellis (2007) described how a leader was able to increase the norm of collaborative problem solving in a group, both examples of the development or modification of structures that guide group members' actions.

As with first-order leadership, we propose that self-managing virtual teams will exhibit a variety of second-order leadership behaviors, but in the case of second-order leadership, we propose that a more centralized or concentrated form of leadership will be associated with effectiveness in the long run. When we talk about more centralized/concentrated leadership, we mean that a number of core team members will exhibit these behaviors, rather than a single individual. We propose that the most effective self-managing virtual teams will be characterized by a leadership structure that includes widely distributed and shared first-order leadership within the team, complemented by strong, second-order leadership centralized in a small number of

core team members. We argue that centralized second-order leadership will be more effective because of the need for clarity and agreement among team members about making changes to the structures that govern and constrain their behavior. As self-managing virtual teams progress in their work, to be effective, they must have a high degree of shared consensus about structures of signification, domination and legitimation. This is more likely to occur in teams in which centralized second-order leaders are able to clearly articulate a vision of these structures that is broadly embraced by all team members. Studies by Kayworth and Leidner (2002) and Piccoli and colleagues (2004) suggest that the most effective self-managing teams virtual teams were those in which one or two team members took the initiative to clarify team members' responsibilities and work process structures. Carte and colleagues (2006) found that self-managing virtual teams initially developed both centralized and decentralized leadership structures, but that over time, centralized leadership structures were associated with higher performance. Eseryel (cite) found that while all team members provided some knowledge and leadership to the team, the core team members provided visibly more leadership regarding the resolution of critical issues, which were central to the success of the team.

We thus offer the following proposition:

Proposition 3: Second-order transformational leadership is more likely to be centralized in a few members in effective self-managing virtual teams.

Proposition 3a: Centralized second-order leadership will be more effective than shared, fluent, and distributed second-order leadership in modifying and changing existing structures of signification, legitimation, and domination.

The Relationship between First- and Second-Order Leadership

A fundamental question remains: How do those who are able to influence change in underlying team structures gain the power to do so (*i.e.*, why do some actions change structures and others do not)? We propose that the answer to this question lies in the nature of the interrelationship between first-order and second-order leadership. We suggest that second-order leadership is action embedded*,* by which we mean that second-order leadership derives its authority from substantive, action-oriented contributions that provide evidence to other team members of an individual's abilities and thus ability to lead, and makes their attempts to alter structure credible and effective. However, the literature on leadership in virtual teams is mixed concerning what type of first-order leadership is likely to confer the credibility on team members that facilitates their emergence as second order leaders, and somewhat contradicts that on leadership emergence in self-managing co-located teams. We thus propose the following relationship between first- and second-order leadership:

Proposition 4: First-order leadership is a prerequisite for second-order leadership. Team members acquire "permission" to be second-order transformational leaders as a result of their having demonstrated first-order leadership in self-managing virtual teams.

Proposition 4a: Those individuals who emerge as second-order transformational leaders will have exhibited more substantive task-oriented first-order leadership than other team members in self-managing virtual teams.

Proposition 4b: Those individuals who emerge as centralized second-order leaders will have exhibited more coordination/process task-oriented first order leadership than other team members in self-managing virtual teams.

Given our definition of second-order leadership and its relation to first-order leadership, we might ask whether change in structures is incremental or discontinuous. Advocates of double-loop learning (Argyris & Schön, 1978) believe that change in underlying structures is only possible when teams have consciously reflected on conditions eliciting a need for change, have surfaced the team's deep assumptions and beliefs, and engaged team consensus for change. In effect, double loop learning theory requires that team members be consciously aware of team structures before they are able to change them. Before changes in theory-in-use (*i.e.*, the tacit structures that govern behavior) are possible, members "…require external references. There must be public representations of organizational theory-in-use to which individuals can refer…. These are the shared descriptions of the organization which individuals jointly construct and used to guide their own inquiry" (Argyris & Schön, 1978, p. 17).

In contrast to this highly rational, discontinuous change model, we propose that the structural change influenced by second-order leadership may sometimes also result from a more incremental, subconscious process. For example, a team's role structure may gradually evolve as the overall task is divided into pieces suitable for different kinds of participants. The job of coordinating task assignment is an example of first-order leadership on a day-to-day basis, and much of this coordination will be distributed self-assignment (*i.e.,* individuals voluntarily taking on tasks for which they have particular skills or interest). However, as structure evolves, second-order leadership will call attention to and clarify the newly emergent structure and influence the team to embrace it. The process of consciously surfacing and describing underlying structures may not be necessary in virtual teams using information and communication technology to collaborate, because the transparent dialogues themselves, archived for subsequent viewing,

become the external reference called for by Argyris and Schön (1978), the public representation of organizational theory- in-use to which individual members can refer.

We therefore offer the following proposition about the nature of structural change in self-managing virtual teams:

> *Proposition 5: Changes in structures of signification, domination, and legitimation in self-managing virtual teams will be incremental rather than continuous and disruptive.*
>
> *Proposition 5a: Self-managing virtual teams will recursively exhibit first- and second-order leadership as structural changes are introduced within the team.*

This proposition suggests that self-managing virtual teams demonstrate exhibit both first- and second-order leadership in order to create, reinforce, and modify structures over time. In response to changes in task demands, or perhaps in proactive anticipation of the next steps toward task completion, self-managing virtual teams manifest first- and second-order leadership as necessary in order to allow the team to adapt and move forward in the completion of their task.

DISCUSSION

We have presented a theory of leadership in self-managing virtual teams. Because traditional leadership theory does not fully explain leadership dynamics in self-managing virtual teams, we have expanded it to include the notion of second-order leadership, forms of leadership that influence changes in the structure that guides team behavior. We have proposed that effective self-managing virtual teams will exhibit a paradoxical combination of widely shared, distributed first-order leadership complemented by strong, concentrated, and centralized second-order leadership. Finally, we have proposed that there is a recursive relationship between first- and second-order leadership that evolves with continued team interaction.

Based on existing theory and empirical evidence, we have developed five propositions deductively from prior theory rather than inductively from systematic empirical observations. To support these propositions requires that they be systematically tested in future research. As well, the theory (like all theories) is only partial. Future research should extend the framework presented here by inductively exploring the antecedents, patterns and consequences of leadership in self-managing virtual teams.

Methodological Issues

A variety of research approaches could be applied to study the processes of leadership in self-managing virtual teams (Walsh, 1995). The use of interview data would enable exploration of the team members' perceptions of the leadership process and allow direct comparison between different members' perceptions of structures, thus explicitly examining how these are developed. On the other hand, content analysis of the interactions between members of self-managing virtual teams would enable detailed analysis of the influence process as it unfolds. Lastly, content analysis of the work that is being done will help with identifying Such analysis infers the deep structures and processes from informed examinations of the artifacts that these surface level dialogues provide. This approach has the advantage of avoiding reliance on the recollections of team members, which may degrade over time or be unreliable in other ways. Such research may be feasible in some cases. For example, many Internet-based collaborations maintain archives of their interactions that are publicly available and corporate virtual teams may have similar data that could be accessed. However, two guidelines for such research should be kept in mind. First, observations should be longitudinal and dynamic, carefully observing changes that occur over time. The phenomenon of leadership is inherently rooted in the passage of time and cannot be observed in a snapshot. Rather, it is a structurational process that can only be seen through a

longitudinal lens. Second, the unit of coding and analysis in such research should be the episode. Leadership is fundamentally an interaction process among team members, and such interactions are best observed episodically.

Managerial Implications

This theory suggests specific actions that members of self-managing virtual teams can take to facilitate team functioning and to improve effectiveness. These include ensuring that all first-order leadership functions are performed well, and preferably by many team members, in a decentralized and shared mode. It also suggests that there is value in centralizing second-order leadership functions. Self-managing virtual teams might more explicitly recruit or select members who are particularly skilled at these functions and pay more attention to the on-going process of developing shared interpretive schema, role structures and rules and norms. Since virtual work is increasingly common, educational programs for all kinds of workers might incorporate these ideas. For example, distance education classes that use technology support for instruction should provide instruction for students on the nature of leadership in self-managing virtual teams and thus set expectations for how the work can best be accomplished, as well as requiring team projects to provide an opportunity to practice these skills.

Whether these propositions are confirmed or disconfirmed by future research, understanding how teams of independent knowledge workers can more effectively work in self-managed virtual teams and virtual environments will improve both the traditional and non-traditional organizations within which they exist. The results of the research we hope to stimulate will then serve as a road map to improve organizational performance and foster innovation.

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FIGURES:

FIGURE 1: A Sequential Model of the Relation between Structure and Action (from Barley & Tolbert, 1997).

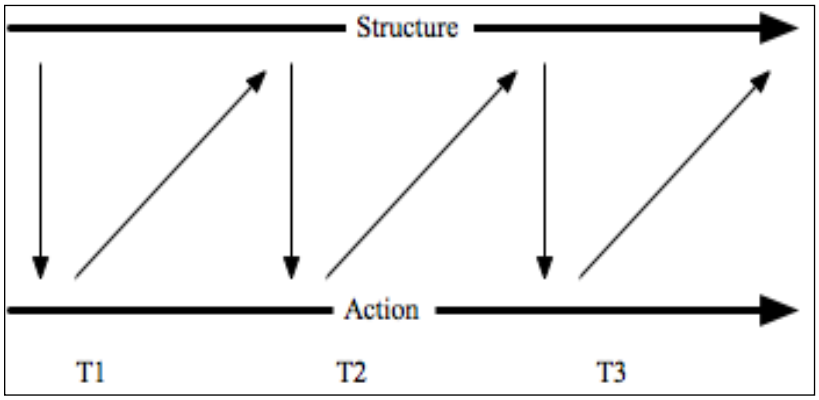

FIGURE 2: First and Second Order Leadership