

Conflict, Leadership, and Performance: What Virtual Team Members Need to Know

Completed Research Paper

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ABSTRACT

Conflict and leadership are both individually well-studied elements of group development. In this paper we seek to understand how leadership and conflict coexist within a team's development and what the temporal context is within which they emerge for higher- versus lower-performing teams. In order to investigate this question we collected survey data, message postings and performance scores for 22 virtual teams over an 11-week period. Our results suggest that high-performing teams experience less relational conflict, engage in more task leadership, and respond more promptly to conflict with appropriate leadership behaviors. We situate these findings in the context of what virtual team members need to know.

Keywords:

Conflict, leadership, virtual teams, longitudinal

INTRODUCTION

One of the crucial determinants of team performance is managing conflict, conceptualized as the “perceived incompatibilities (Boulding & Ewart, 1962) or perceptions by the parties involved that they hold discrepant views or have interpersonal incompatibilities” (Jehn, 1995, p.257). Alternatively, conflict is the “process resulting from the tension between team members because of real or perceived differences” (De Dreu & Weingart, 2003, p.741). Regardless of whether one views conflict as a perception of differences or the behaviors resulting from such perceived differences, the implications for team outcomes largely have been negative (De Dreu & Weingart, 2003), and many research efforts have focused on conflict management (e.g., Miranda & Bostrom, 1993; Montoya-Weiss, Massey, & Song, 2001) as well as sources of conflict (e.g., Carte & Chidambaram, 2004).

In this paper we focus on how emergent team leadership may help mitigate the negative consequences of conflict. Leadership represents an important element for groups – one necessary for directing behaviors in pursuit of common goals (Hoyt and Blascovich, 2003). Often conceptualized as individual activities focused on guiding, structuring, and facilitating the behavior of others in pursuit of a shared goal (Sarker, Grewal and Sarker, 2002), many theories about leadership effectiveness abound, most of which tend to view the leader as a single, dominant individual occupying a formally defined leadership position in the social structure. However, virtual teams arguably are more analogous to self-managed work teams than to the more traditional leader-led teams previously studied (DeRosa, Hantula, Koch and D'Arcy, 2004); however assigned leader or not, leadership behaviors are necessary in order to move the team forward (Zigurs, 2003). Research into virtual team leadership suggests all members of the team contribute by sharing and rotating leadership roles resulting in leadership as a collective effort distributed among team members (Zigurs, 2003; Avolio, 1999).

While the outcomes of conflict are often negative, most researchers agree leadership positively impacts team outcomes. Further, some conflict researchers have argued that, if properly managed, some level of conflict can be beneficial. Interestingly, little work has been done that investigates the interaction of leadership and conflict in teams, and even less work has been done in this area specifically focusing on virtual teams. In a notable exception, Wakefield, Leidner, and Garrison (2008) investigated conflict and leadership in virtual teams and found correlations between monitoring behavior and reduced task conflict as well as mentoring and facilitating and reduced relational conflict. However, their study was based on cross-sectional data. We seek to build on their findings by investigating this phenomenon using a longitudinal experimental design. Thus, our main research question is:

Do higher-performing virtual teams engage in patterns of leadership and conflict that are different from the patterns of lower-performing virtual teams?

In order to address this question we collected data from members of 22 virtual student teams. In contrast to earlier work (Wakefield et al., 2008) that relied solely on survey data, we captured data from multiple sources; we captured perceived conflict via survey data, emergent leadership behaviors by coding posted messages, and performance through instructor evaluations. The results from analyzing this data provide interesting insight that should prove useful to anyone participating in a virtual team.

LITERATURE REVIEW

Much of the existing findings on teamwork rely on archetypes of groups which focus on a traditional team environment where members are collocated. Virtual teams, i.e., teams that are distributed in space or time and often rely partially or entirely on communication technologies to interact, often encounter significant challenges completing the stages of development outlined by Gersick's (1988) punctuated equilibrium and Tuckman's (1965) staged model in their respective lifecycle development. Furst, et al., (2004) specifically highlights the challenges which teams may have in establishing expectations, priorities, and norms for the work to be done by individuals. Recent studies have examined several ways to minimize the struggles faced by virtual teams when navigating stages of a team lifecycle. These moments of moderated guidance through the stages and punctuations of a lifecycle were shown to be effective for teams in varying capacities, with the overall intention for teams to self-manage and moderate their own progress (Furst, Reeves, Benson, and Blackburn, 2004). While there are certainly many variables at play in the interactions of virtual teams; most, if not all, of which might benefit from such "moderated guidance" for team members, we focus on developing a better understanding of conflict and the emergent leadership behaviors members can engage in to manage conflict and lead to more positive outcomes for the team.

Conflict

Conflict and its consequences for work groups have been well studied. In a meta-analysis DeDreu and Wiengart (2003) concluded that both task and relationship conflict result in poorer team-level results and less satisfied team members. Research indicates that many of the same types of conflict experienced by traditional teams (task and relational) still arise, often with higher frequency, in geographically dispersed teams (Hinds & Bailey 2003). The separation of conflict into categories of task and relational conflict has been useful for researchers to determine the types of activities or interactions which give rise to excessive conflict and allow managers to understand which is most destructive in a teamwork environment. Task conflict results when disagreements arise surrounding the activities and required tasks which must be done to complete parts of a team's project. Relational conflict is typically caused by misunderstandings of the ways in which tasks and messages are communicated and the overall interpersonal contexts they are sent and received within. Relational conflict typically is not correlated precisely with the tasks which team members are working on, but creates resentment between team members (Wakefield, et al., 2008).

Virtual teams may experience greater conflict or have more difficulty managing conflict due to insufficient communication cues provided by communication technologies (Hobman, Bordia, Irmer, & Chang, 2002) which can lead to frustration and lower levels of participation (Swann, 1999). Generally, virtual team members cannot see or listen to the reaction of other members fully and immediately and as such struggle to believe their frustrations are being "heard" by teammates. Alternatively, there is some research suggesting that the impersonal nature of the virtual environment (i.e., the lower social cues or less "rich" media) may act as a buffer, keeping conflict from becoming personal (Carte and Chidambaram, 2004). Such argument presuppose the individuals in the team make effective use of the media – maintaining the impersonal nature when dealing with conflict, thus eliciting differences of opinion that are valuable, all the while sharing sufficient personal information to develop shared team identity or a sense of cohesion (Chidambaram 1996). One possible approach individuals may take is to engage in extra-role behavior focused on the combined team goals of performance and group maintenance. Such behaviors are generally labeled emergent leadership.

Emergent Leadership

The functional leadership approach asserts that a team leader's main job is to "do, or get done, whatever is not being adequately handled for group needs" (McGrath, 1962, p. 5). Thus, team leadership is considered effective if task accomplishment and group maintenance are adequately addressed (Hackman and Walton, 1986). This dual focus on task and social needs is consistent with team development literature which suggests that groups may change their focus over time. For instance, the punctuated equilibrium model of group development (Gersick, 1988) asserts that as groups near the end of a

project, they tend to shift their focus from group interactions (social) to task deliverables (task). Similarly, the theory of Time, Interaction and Performance (TIP) suggests that over time, groups shift their focus between performance, member support, and well-being (McGrath, 1991); functions which have been subsequently aggregated and conceived of as task-oriented and socially-oriented by other researchers (see Dennis, Fuller and Valacich, 2008). Task-oriented leadership includes behaviors such as encouraging subordinates to follow rules and procedures, maintaining high standards for performance, and making leader and subordinate roles explicit. Socially-oriented leadership includes behaviors such as helping and doing favors for subordinates, looking out for their welfare, explaining procedures, and being friendly and available (Eagly and Johannesen-Schmidt, 2001).

The notion of task-oriented leadership is consistent with current articulations of directive leadership as guiding followers' participation and providing and seeking compliance with directions for accomplishing assigned tasks (Kahai, et al., 2004). Previous research has linked directive leadership styles to improved group participation and performance in technology supported teams (Kahai, et al., 2004). The improved performance was attributed to the directive leader's ability to reduce role ambiguity thus improving confidence and motivation to participate. Socially-oriented leadership is consistent with current articulations of participative leadership as characterized by increased follower participation and is defined as the equalization of power and shared problem solving between leaders and followers (Kahai, et al., 2004; Bass, 1990). This type of leader behavior can improve team performance through increased participation (Kahai, et al., 2004). Further, participative leadership can be especially effective in combination with the collaborative technologies used by virtual teams because it is consistent with the spirit of promoting participation that is common among these tools (Kahai, et al., 2004).

Virtual teams, while likely focused on the same performance and relationship enhancing outcomes as traditional teams, their leadership likely will take a different form due to changes in the availability of information, dispersion of the team, and permanence of the communications (Avolio and Kahai, 2003). Recent work on virtual teams suggests that their technology-mediated leadership might be better viewed as a developmental process to which all members of the team may contribute by sharing and rotating leadership roles and leadership becomes a collective effort distributed among team members (Zigurs, 2003; Avolio, 1999). As such, rather than focus on formal leadership, we focus on emergent leadership; e.g., leadership that is spontaneously accorded by fellow team members; develops over time through group processes. Emergent leaders earn their status through incremental influences and contributions to the team (Yoo and Alavi, 2004). Emergent leadership can also take the form of task or social behaviors (e.g., Carte, Wang, and Schwarzkopf, 2010).

METHODS

Subjects

Twenty-two largely 5-person teams¹ were assembled from 107 students enrolled in an introductory database course at three US-based universities. For twenty percent of their course grade the teams were tasked with developing a database. The assignment was completed in four phases over 11 weeks (as described in Table 1).

The task was directly relevant to the students' experience and course of study, consistent with DeSanctis' (1988) suggestion that any concerns about the use of student respondents are lessened if the students are performing tasks relevant to their experience. No formal leaders were assigned. Participant demographics are provided in Table 2.

Research Procedures

The project teams used *Yahoo! Groups*, a commercially available web-based groupware tool, to communicate with each other and to post project deliverables. Each team had a shared workspace in *Yahoo! Groups* that included threaded discussion boards as well as a shared file space that students could use to create directories, upload files, and post their final deliverables for instructor evaluation.

Independent Variables

Our measures of task-oriented and socially-oriented leadership behavior were coded from messages posted on *Yahoo! Groups*. Messages were read and incidents of leadership behaviors were identified within each message. As such, a particular message could contain multiple behaviors. In all, 3,972 messages were exchanged and subsequently coded. The primary coder evaluated all messages in all 22 teams. A second coder evaluated two randomly selected teams and interrater reliability was adequate at 93.8% [measured as $1 - (\text{number of disagreements} / (\text{number of messages} \times \text{number of behaviors}))$]

¹ There were three four-person teams.

indicating that the first coder was applying the coding scheme in a replicable fashion.² Because gender might influence coder perceptions (Lord et al, 1980) we used one male and one female coder.

Table 1: Research task description and duration

Task description	Task duration
Draft conceptual data model: teams delivered draft data model consisting of entities and relationship developed using the VISIO CASE tool.	Three weeks
Final conceptual data model: teams revised their draft models and delivered a finalized data model consisting of entities, relationships, and attributes using VISIO, data dictionary using MS Word.	Two weeks
Logical data model: teams delivered a normalized data model with foreign keys inserted using VISIO and revised data dictionary using MS Word	Three weeks
Implementation: teams delivered final conceptual and logical models using VISIO, fully populated MS Access database as well as 10 queries, two input forms and one report using MS Access.	Three weeks

The Leaderplex model (see Figure 1) was used to guide our coding because previous work has been done to develop a coding scheme along these eight dimensions (see Carte, Chidambaram, and Becker, 2006). Following the previous work suggesting a two-factor solution (i.e., Vilkinas and Cartan, 2006) and coding guidance for the eight behaviors, we coded behaviors engaged in by our participants as socially oriented if they demonstrated properties of facilitating, mentoring, or innovating. We coded behaviors as task oriented if they demonstrated properties of brokering, producing, directing, coordinating, or monitoring. In our analysis, task leadership behaviors and social leadership behaviors were represented by the total number of leadership behaviors individuals on each team engaged in within each category (i.e., task or social) for each time period.

Surveys were administered to capture relational and task conflict utilizing previously validated measure (Miranda and Bostrom, 1993). Exploratory and confirmatory factor analysis indicated acceptable construct validity, and reliabilities were stable over all time periods ($\alpha=0.747, .681, .829$, and $.739$ respectively).

Table 2: Demographics

Variable	Mean (SD)
Age (in years)	22.7 (4.60)
Work experience (in years)	3.98 (4.02)
Grade point average	3.15 (0.44)
Gender	Male=83; Female=24

Dependent variable

Performance was assessed on a 100-point scale by each of the three instructors after engaging in a calibration exercise. The average of the three scores was used for data analysis.

² Given the high interrater reliability it was decided that additional coding by the second coder would not produce any additional insight.

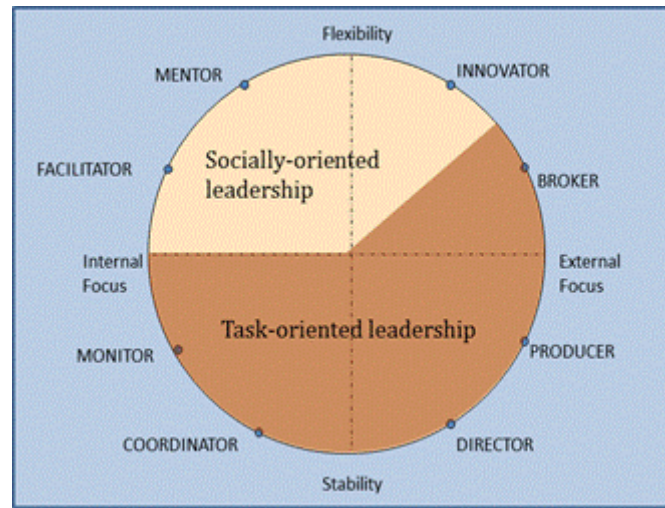


Figure 1: Leaderplex Model based on Behavioral Complexity in Leadership (BCL)
Source: Adapted from Denison, Hooijberg, and Quinn, 1995

ANALYSIS

In order to assess our data while still taking into account the longitudinal nature of the data, we began our analysis by splitting our sample into high and low performing teams. We first averaged each team's scores over the four time periods, and then we calculated the average of this number for all 22 teams. Using this mean ($\bar{x} = 88.81$), we split the sample resulting in 12 lower performing teams and 10 higher performing ones. Our analysis then focused on the differences in behavior across these samples using t-tests³. Before comparing leadership behaviors across these teams, though, we first assessed whether there were any differences in ability. Using self-reported GPA as a surrogate for ability, we found no significant differences between samples ($p = .1879$, $\bar{x}_h = 3.202$, $\bar{x}_l = 3.113$).

Table 3: Independent Results for Conflict and Leadership

	Task-Oriented		Relationship/Socially-oriented	
	Conflict	Leadership	Conflict	Leadership
High-performing team average	15.548	138.300	9.694	36.100
Low-performing team average	15.335	115.333	11.724	34.083
T-test p-value	0.389	0.078	0.012	0.360

We began our analysis with independent assessments of conflict and leadership differences in our high- and low-performing teams. As noted in Table 3, there were significant differences in terms of relationship conflict ($p=.012$) and task leadership ($p=.078$). Relational conflict was, on average, higher in low performing teams throughout the project. For high performing teams, perceptions of relational conflict consistently averaged about 2.5 (on a 7-point Likert scale). Low performing team members perceptions averaged closer to 3.0. Further, task-oriented leadership was significantly higher in the high performing teams at an average of 138.3 occurrences, while low performing teams averaged 115.3 instances. In order to further understand the patterns of leadership and conflict over time we constructed graphs (see Figure 2). These graph show that while task leadership and relational conflict exhibit overall differences in level (as indicated by our t-test results), task

³ While we believe our data includes rich understanding of our phenomenon or interest, ultimately our sample size is 22, as such we restrict our analysis to t-tests and correlations.

conflict and social leadership exhibit time-based differences not detected by our overall analysis. *Post hoc* analysis showed significant differences between our high- and low-performing teams for task conflict in time 2 ($p = .088$, $\bar{x}_h = 4.19$, $\bar{x}_l = 3.78$) and for social leadership in time 1 ($p = .050$, $\bar{x}_h = 10.50$, $\bar{x}_l = 7.08$) and time 2 ($p = .064$, $\bar{x}_h = 10.20$, $\bar{x}_l = 7.58$).

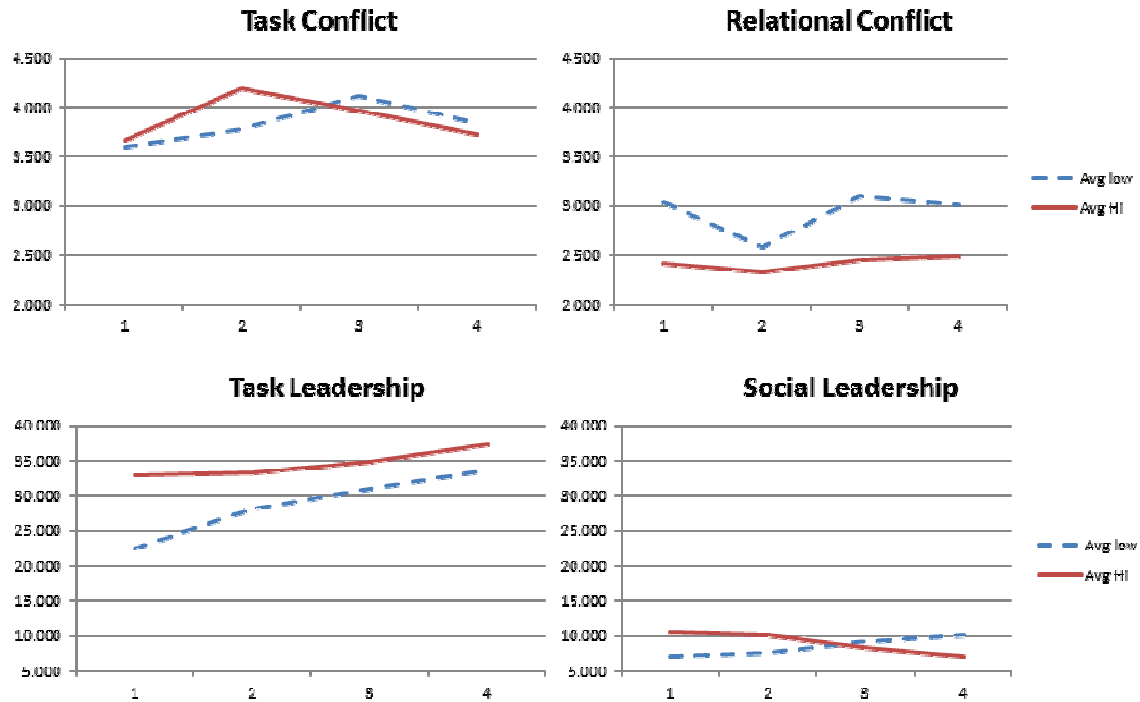


Figure 2: Time-based Conflict and Leadership

These results suggest differences among our high- and low-performing teams in terms of perceived conflict and emergent leadership separately, we now turn our attention to combined patterns of conflict and leadership among the high- and low-performing teams. Again, while we believe we have collected a rich data set, our small sample size precludes many data-analysis techniques. We calculated Pearson correlations between each of our four variables for high- versus low-performing teams. Results (including significance levels for a 2-tailed test) are provided in Table 4. These results show that task leadership and both types of conflict were correlated for our low-performing teams but not the high-performing teams. Further, socially-oriented leadership was correlated with both types of conflict for our high-performing teams but only relationship conflict among our low-performing teams. These results suggest that meeting conflict with task-focused leadership behaviors may be detrimental to team outcomes. Instead, our high-performing teams dealt with conflict in more participative ways (i.e., socially-focused leadership behaviors). This is inconsistent with previous findings that suggested that monitoring (a task-focused leadership behavior) was negatively correlated with task conflict and mentoring and facilitating (relationally-focused leadership behaviors) were negatively correlated with relational conflict (Wakefield, et al., 2008).

Table 4: Correlations

		Task Conflict	Relationship Conflict
Task-oriented leadership	High-performing teams	-0.025 (ns)	0.056 (ns)
	Low-performing teams	0.688 (p<.01)	0.750 (p<.01)
Socially-oriented leadership	High-performing teams	0.502 (p<.10)	0.677 (p<.02)
	Low-performing teams	0.193 (ns)	0.631 (p<.02)

Again, these overall correlations may be obscuring time-based perceptions and behaviors within our teams. Our time-based correlational analysis found in our high-performing teams task-based conflict in time 1 was positively correlated with social leadership in time 1; conversely in our low-performing teams, task conflict in time 1 was correlated with both task and social leadership – but not until time 3. Further, relational conflict was correlated with social leadership in our high-performing teams in time1, but in our low performing teams relational conflict was correlated with task leadership. Perhaps the most interesting correlations occurred in the low performing teams, where both task leadership and relational leadership behaviors exhibited during periods 3 and 4 were connected with perceived task conflict in both periods 3 and 4. Additionally, relational conflict was perceived during period 3 and 4 in connection with task leadership in both periods 3 and 4, as well as relational conflict perceived in period 4 correlated with relational leadership in periods 3 and 4. In our high-performing teams, there were very few significant correlations in times 3 and 4, and where they were found, the correlations were negative (these were correlations between task leadership and relational conflict). Interpreted in light of Figure 2, these negative correlations suggest greater incidences of leadership being correlated with lower perceived conflict.

DISCUSSION

We set out to answer the question:

Do higher-performing virtual teams engage in patterns of leadership and conflict that are different from the patterns of lower-performing virtual teams?

In order to address this we collected survey data, message postings, and performance data from 22 virtual teams over an 11 week period. Our findings suggest the answer this question is: yes. High performing teams engaged in more task leadership and experienced less relationship conflict than low-performing teams. Further, high-performing teams exhibited more social leadership when conflict was perceived and such leadership behaviors occurred earlier in the team's lifecycle and concurrently with the conflict. These findings extend those of Wakefield et al. (2008) by utilizing different measures for all constructs (conflict, leadership, and performance) and by extending the design to include time.

In order to effectively navigate virtual team processes individual team members must actively engage with their team and become effective computer-mediated communicators. Part of effectively applying these skill sets requires individuals to understand *when* certain efforts may be more valuable to the team. Our results specifically shed light on how individual team members may help manage team conflict by engaging in emergent leadership behaviors.

Conflict

Conflict is an integral part of group development and does not necessarily have to have a detrimental effect on group outcomes if properly managed. Task conflict can contribute to greater team participation (Robey & Farrow, 1982) and help teams make better decisions by exploring more of the solution space; although meta-analytic results suggest task conflict is more likely to have negative consequences (DeDreu and Weingart, 2003). In contrast, relational conflict has been linked to reduced cooperation and teamwork and greater hostility (Robey & Farrow, 1982). Virtual teams can experience greater conflict or have more difficulty managing conflict due to insufficient communication cues provided by communication technologies (Hobman, et al., 2002), physical distance between members (Hinds & Bailey, 2003), and separate contexts amongst members (Cramton, 2001)—all of which are known to lead to more frustration and withdrawal (Swann, 1999). Generally, virtual team members cannot see or listen to the reaction of other members immediately or properly and as such struggle to believe their frustrations are being “heard” by teammates. The teams in our study perceived more task conflict than relational conflict; although this may be related to the limited duration of the study. And our higher-performing teams experienced less relational conflict than their lower-performing counterparts. While our task conflict findings are inconclusive, the relational conflict findings are consistent with this previous work.

Leadership

Lack of a designated leader is a common challenge for virtual teams (Tyran, Tyran and Shepherd, 2003), and self-leadership is often required in a virtual context due to the geographic distance separating teammates (Zigurs, 2003). In essence, each member of a virtual team is expected to exhibit leadership behaviors in order to facilitate task accomplishment for the team. Our high-performing teams engaged in more task leadership than their low-performing counterparts. While they did not engage in more overall social leadership than the low-performing teams, they did seem to engage in social leadership that was better timed than the low performing teams. In order to understand this, we turn to models of team development.

Team development

Two major team lifecycle models as illustrated by Tuckman (1965) and Gersick (1988) describe the different processes that occur in a team-based work environment. In the punctuated equilibrium model, teams strategize and create expectations for their assigned tasks, and then once the midpoint of the project timeline occurs, a noticeable shift in project focus happens, where teams prioritize completion of tasks before their project deadline. Alternatively, a team's lifecycle could be conceived of as a set of stages (i.e., forming, storming, norming, performing) (Tuckman, 1965). More recently, these models have been combined to suggest the stages of the Tuckman model could be traversed by a team both before and after a midpoint transition (Chang, Bordia, and Duck, 2003). In addition to these general models of development, previous research suggests that in comparison to face-to-face teams, virtual teams are generally more task-oriented (Bhappu et al., 1997) and take longer to exchange social information compared to face-to-face teams (Chidambaram, 1996; Walther, 1992).

Observations of our high- and low-performing teams align well with the Tuckman (1965) stage model of a group life cycle, where teams that performed well experienced their struggles early on and were able to set themselves on a track to complete their tasks without excessive conflict. Our high-performing teams engaged in more task leadership in the first half of their lifecycle (specifically in time 2) compared to low-performing teams. This effort coincided with a sharp downturn in task conflict in the second half of their lives. This does not tell the whole story though. Our correlation analysis suggests that it was well-timed social leadership behaviors that likely contributed to the management of their conflict. Most importantly, stopping the escalation of task conflict allowed the high-performing teams to avoid this conflict becoming personal (i.e., developing into relationship conflict). This is inconsistent with previous studies – that virtual teams are primarily task focused. High-performing teams must overcome this bias toward task focus in order to effectively manage conflict. Forming and storming likely took place early on for the high performing teams, as they moved quickly into a mindset of task oriented goals. Conversely, our low-performing teams may have struggled with the storming stage, traditionally characterized by an increase in team disagreement and arguments, as a spike in conflict for these teams emerged later on in the project than for their counterparts. Perhaps as a result, they struggled with greater relational conflict. Further, when our low-performing teams perceived conflict, they appeared to engage in task leadership. While this is a potentially natural response from a virtual team, it appears to be a dysfunctional reaction to conflict.

LIMITATIONS

Like any study, this one is not without limitations. We do not have face-to-face data to serve as a baseline to provide evidence that our findings are specific to virtual teams. Further, there may be other differences in our teams that explain the differences in outcome. For example, perhaps the high-performing teams had members with more database experience – although we saw no evidence of this in the data.

CONCLUSION

Most organizations today utilize virtual teams to varying degrees, and their use is likely to grow in coming years as companies look for more and more ways to leverage technology in pursuit of improved efficiencies. Hence, understanding how such teams may differ from traditional face-to-face teams is not simply of interest to researchers, it can potentially provide valuable prescription to practice. Our findings suggest that individuals engaged in virtual team activities may be poised to add greater value in their team when they take care to engage in both task and social leadership early on. Further, they may help their teams by taking care to express conflict when they feel it so that the team can appropriately address it.

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