The Pennsylvania State University

The Graduate School

College of the Liberal Arts

A TEAM PROCESS AND EMERGENT STATES APPROACH TO

UNDERSTANDING TEAM CONFLICT AND OUTCOMES

A Dissertation in

Psychology

by

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Submitted in Partial Fulfillment
of the Requirements
for the Degree of

Doctor of Philosophy

August 2010

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ABSTRACT

It has been suggested that a central challenge of leading teams is stimulating productive conflict that may contribute to positive outcomes while minimizing the presence of dysfunctional conflict. This study examined the roles of four emergent states: Goal Commitment, Knowledge of Team Roles, Transactive Memory Systems and Performance Feedback in influencing Team Conflict and consequently, team effectiveness (Performance and Innovation). It was hypothesized that Team Trust would moderate the relationship between the emergent states and conflict and between conflict and the two team outcomes, Innovation and Performance. It was also hypothesized that team conflict would mediate the relationship between the emergent states and the two team outcomes.

Study participants consisted of 231 members of thirty-three (33) work teams from organizations in the Washington, DC region. The teams were recruited from organizations in the Washington DC area and consisted almost exclusively of teams from local municipal governments (31 teams). The final sample consisted of thirty-one teams with a mean team size of 7.45 (sd = 4.38) and a mean participation rate of 90% (sd=.15).

The team members completed a confidential fifty-four item Team Questionnaire, describing their team and team experience on the variables of interest. The team data collection meetings were held at the teams' location and lasted from 20-30 minutes.

Hierarchical multiple regression was used to evaluate the study hypotheses involving the relationships of Goal Commitment, Specialization, Coordination, Credibility, Role Knowledge, and Performance Feedback with team Conflict. Trust, the hypothesized moderator variable, was entered into the equation as part of an interaction term with each predictor of interest in the various regression models.

Due to psychometric issues that required the analysis of overall Team Conflict instead of the Relationship and Task Conflict subscales, several of the hypotheses involving the subscales could not be tested. However, the core hypotheses were tested using the overall Team Conflict score and the Transactive Memory subscales, Specialization, Coordination and Credibility.

The hypothesized moderator role of Team Trust was partially supported. The findings indicated that Trust moderated the relationship between the level of perceived Credibility of team member information and Team Conflict. Trust also moderated the relationship between Performance Feedback and Team Conflict. The hypothesized moderator role of Trust in the relationship between Team Conflict and team outcomes was also partially supported. Trust did not moderate the relationship between Team Conflict and Performance, but did moderate the relationship between Team Conflict and Innovation. Lastly, the hypothesized mediator role of Team Conflict in the emergent state – team outcomes relationship was not supported.

Despite methodological issues the findings highlight the important role of trust in influencing team effectiveness, either directly or through interaction with other team emergent states and processes.

TABLE OF CONTENTS

List of Figures

List of Tables

Acknowledgements

I would like to thank the following people for their help and support in completing my degree:

My dissertation committee for their support, guidance, and flexibility. Especially to my Chair, Dr. Rick Jacobs and Dr. Jim Farr whose long term patience and commitment is unbelievable. Also to Dr. Susan Mohammed and Dr. Sumita Raghuram whose willingness to step in and help me conclude this journey is deeply appreciated. I also thank the late Dr. Frank Landy who challenged and encouraged me.

Dr. Harold Conley who inspired me and a generation of students at Hampton Institute.

Ms. Sherri Gilliland and Pauletta Leathers whose helpfulness is deeply appreciated, and Ms. Jean Courter, whose unwavering kindness and support is legendary.

The participating leaders and teams without whom the study would literally have been impossible.

My colleagues and friends at ILS and George Washington University, and many of our clients.

My brothers and sisters and many friends whose steady stream of prayers, help, and encouragement always kept the wind at my back.

My parents, Ozzie and Sarah Harvey, the wisest, most loving, fiercest supporters, anyone could ever have in their corner. Your faith, encouragement and prayers no know limits. This degree is just as much yours as it will ever be mine.

My fantastic boys, Donovan and Dylan, who missed so many fun times, but still had the time to say "Daddy you can do it!" and "I want to help."

My beautiful, wonderful, brilliant wife Dr. Jacquelyn Duval-Harvey. You've been there almost from the beginning and have been the inspiration and support when getting to this point seemed the least likely.

To God for the opportunity and grace to allow it to happen.

Chapter 1

INTRODUCTION

Rousseau, Aube, and Savoie (2006) have noted that in many organizations the fundamental unit of work structure is the team. Others have suggested that a central challenge of leading teams is stimulating productive conflict that may contribute to positive outcomes while minimizing the presence of dysfunctional conflict (Kotlyar & Karakowsky, 2006). Given the above, it is not surprising that intragroup conflict is a common focus of interventions designed to improve team performance. A significant amount of practitioner intervention efforts focuses upon identifying the appropriate leader style or approach, improving the relationships of the team members via teambuilding activities (e.g. facilitated efforts to increase communication and trust), or use of structured problem solving approaches (e.g. Interest Based Problem Solving) to address specific conflicts. However, it is proposed here that the investigation of the role that several important emergent states may play in shaping team conflict and performance holds substantial promise for understanding and addressing team dynamics and outcomes.

This study examines a model that describes the mechanisms by which **Emergent Affective and Cognitive States** (Goal Commitment, Knowledge of Team Roles, Transactive Memory Systems, and Performance Feedback) influence **Team Conflict** (Task and Relationship), which mediates their relationship with important **Team Outcomes** (Team Innovation, and Performance). The conceptual model also suggests that **Trust** plays an important moderator role in influencing the relationships

between several of these variables. The study investigates some of the core relationships in the model through an empirical study in organizational settings.

The model proposed here represents a departure from the traditional Input-Process-Output (IPO) framework used in a significant amount of research on teams. Although the Input-Process-Output model has been the predominant organizing framework for studying teams, some have suggested that the IPO model is too limited to effectively capture the rich and dynamic nature of how teams function. For example, Ilgen, Hollenbeck, Johnson and Jundt (2005) confirm the beneficial impact of the IPO model in shaping team theory and research, but suggest that "the convergence on consensus regarding the utility of IPO models as a guide to empirical research fails to capture the emerging consensus about teams as complex, adaptive systems". They suggest that the IPO model is insufficient for characterizing teams in at least three ways:

1. Many of the mediational factors that link input to outcomes are not processes. Marks, Matthieu, & Zaccaro (2001) describe some of these non-process mediational factors as emergent cognitive or affective states.

2. The IPO framework reflects a "single-cycle", linear approach to team dynamics, despite the fact that many conceptualizations of team functioning acknowledge the likelihood of feedback loops (e.g. Hackman, 1987).

3. The IPO model reflects a progression of main effects (i.e. inputs influencing processes which influence outcomes) however many research findings reflect interactions of the Inputs X Process, process X process, or input or process X emergent state (Colquit et al, 2002; De Dreu & Weinsart, 2003).

Ilgen et al (2005) go on to suggest that a more appropriate model for the current dynamic perspective on teams is an Input-Mediator-Output-Input model.

The model investigated in this study is consistent with Ilgen and colleagues' IMOI model, and as such does not limit the mediational factors to traditional team process variables. Further, it is anticipated that several key relationships will reflect interactions as opposed to main effects.

Model

A graphic representation of the variables and relationships that were investigated in this study is provided in Figure 1. Hypotheses regarding the relationships described in the model are listed in the section following the model.

It is important to note that it is not presumed that team processes and emergent states are the only factors influencing team conflict and performance. Clearly factors such as team make-up (e.g. levels of diversity), supportiveness of the broader organizational culture, and resource issues, play a key role. However, while these factors are acknowledged as influences of team conflict and performance, they are not focused upon in the present study. Instead, the focus is on several emergent states believed to be factors over which the typical team leader in an organization has some control. As such, they are important targets for increasing our understanding of their relationship to team conflict and performance.

Emergent States

Goal Commitment

Team Role Knowledge

Transactive Memory System

Performance Feedback

Team Conflict
- Relationship
- Task

Team Outcomes
- Innovation
- Performance

Team Trust

Team Trust
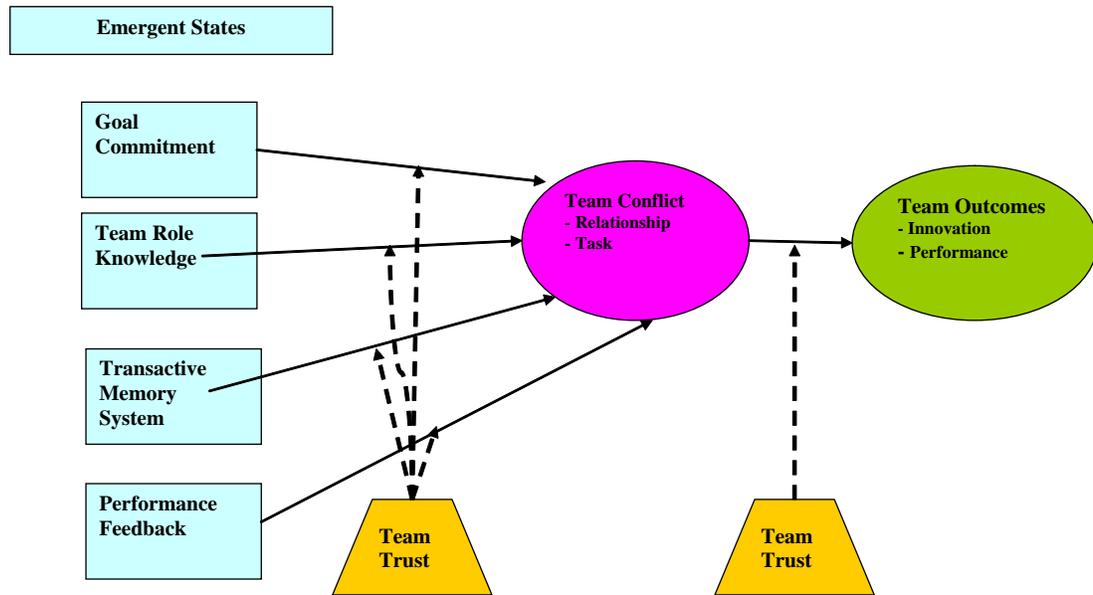
Figure 1-1 Emergent State- Conflict Model Investigated in the Current Study

The following chapters will provide an overview of the literature relevant to the variables of interest in the study and the hypothesized relationships between them, a description of the methodology, a description of the results, and a discussion of the key findings, implications, and study limitations.

Chapter 2

REVIEW OF THE LITERATURE

The following sections provide an overview of the literature relevant to the core variables of interest examined in this study. This is followed by a description of the study hypotheses.

Team Cognitive Structure

Although the concept of team cognitive structure is only two decades old (Cannon-Bowers, Salas & Converse, 1993) it has accumulated substantial empirical support for its importance in the dynamics and performance of teams. The work of DeChurch and Mesmer-Magnus (2010), Mohammed, Ferzandi and Hamilton (2010), Salas, (2004) and Peltokorpi (2008) amply support the impact of various conceptualizations of cognitive structure on teams. DeChurch and Mesmer-Magnus' (2010) meta-analysis of sixty-five studies investigates team cognition and its relation to teamwork processes, motivational states and performance outcomes. The study makes significant contributions in documenting the impact of team cognition. It also clarifies the relationship of team cognition to team processes and suggests a framework for integrating the disparate research conducted under the broad heading of team cognitive process.

Specifically, DeChurch and Mesmer-Magnus found that team cognition has strong positive relationships to team behavioral processes, motivational states and team performance. Their analyses also indicate that the impact of team cognition on

performance holds true, even after controlling for the effects of motivational states and behavioral processes.

In their examination of team cognition, DeChurch and Mesmer-Magnus investigated the "nature of emergence" dimension of team cognition described in Kozlowski and Klein (2000) which suggested that team cognitive approaches could be differentiated on the basis of how they emerge. The distinction is made between team cognitions whose emergence is compositional in nature, in that it represents an aggregation of the individual level cognitions, and thus are similar in form and function to those at the individual levels, versus those that are compilational, which is a team level construct that is derived from, but different than the individual level cognitions that are its root.

Transactive memory (TMS) is an example of this compilational form of team cognition (Kozlowski & Klein, 2000; DeChurch and Mesmer-Magnus, 2010). The TMS approach to team cognitions is composed of the individual knowledge sets, coupled with an awareness of who knows what. These are demonstrated by the application of the knowledge to the coordination of information within the team. DeChurch and Mesmer-Magnus (2010) also found that while both compositional and compilational cognitive processes are positively related to team processes and performance, the relationships are stronger for compilational emergence.

Also, among the cognitive moderators examined by DeChurch and Mesmer-Magnus was the impact of the particular content of the cognition studied. Cannon-Bowers, Salas, & Converse (1993) initially suggested four content areas for team cognition: technology and equipment, job or task, team interaction, and team. However, Mathieu, Heffner, Goodwin, Salas and Cannon-Bowers (2000) proposed that these were subsumed under two broad areas: team-related cognition, and task-related

cognition. Task-related cognition refers to elements such as the team's job, major task duties, equipment and resources. Team-related cognition addresses how members act and are inter-dependent with one another. An example of this is the roles that members play.

There has been consistent empirical support for the impact of both task and team based cognitive structures on team processes, states and performance (Salas & Fiore, 2004). Cannon-Bowers and Salas (2001) proposed that the nature of the content may impact how the cognitive structures influence teams. Specifically, they suggest that task-based structures may influence team performance more strongly, while team-based cognitive structures may exert a stronger influence on team processes.

DeChurch and Mesmer-Magnus (2010) found that the content of cognitive structures (task-based versus team-based) did not moderate the cognition-performance relationship, but did moderate the cognition-process relationship. Team-based cognitive structures had stronger relationships with team processes than did task-based relationships.

Transactive Memory

Wegner, Giuliano, and Hertel (1985) define transactive memory systems (TMS) as a set of information possessed by each member of a group combined with a shared awareness of who knows what within the group. Research suggests that TMS positively affects group performance by facilitating members' ability to specialize in individual knowledge areas and use each other as cognitive aids (Kozlowski & Iglen, 2000, Peltokorpi, 2008).

Several factors influence the development and effectiveness of TMS (Hollingshead, 2001; Brandon & Hollingshead, 2004; Peltokorpi, 2008). According to Peltokorpi (2008), the first factor is the extent to which people are cognitively interdependent, interact with each other, and are motivated to share knowledge and learn from what others know. Second, there needs to be agreement on who the experts are and this agreement should match the reality of who is actually the expert. Third, there should be sufficient complexity in the tasks to promote team members' collaborating and using information from each other. Finally, groups should have sufficient membership stability to avoid the disruptions in TMS that come with group turnover.

There has been substantial research on TMS systems in two broad domains. True to its origins, in Wegner and colleagues early work with couples, significant research has involved couples and other dyads. This work supplied substantial support for the existence of TMS and its positive impact on performance. A review of this body of knowledge is provided by Peltokorpi (2008). Peltokorpi (2008) also reviews the research on TMS in teams/groups, finding positive relationships among TMS, team processes and performance.

Austin (2003) examined the relationship between TMS and performance in a group of mature teams in an organizational setting and found that TMS was positively related to performance as measured by group goal performance, as well as internal and external ratings. Lewis (2003) developed a 15-item scale to assess TMS based on the dimensions of specialization (the differentiated structure of members' knowledge), coordination (effective, orchestrated knowledge processing), and credibility (members' beliefs about the reliability of other members' knowledge. The scale was designed to aid in the assessment and investigation of TMS in field settings, an option that had

previously been lacking. In the field test of the instrument with graduate student consulting teams, Lewis(2003) found that TMS was positively related to functional communication as well as advisor and client ratings. In the second study, Lewis (2003) used the same scale in a sample of teams in high technology companies and found similar positive relationships of TMS to functional communication and ratings of team performance.

In a study by Rau (2005), TMS in top management teams were examined. She focused on a representation of TMS operationalized by two dimensions: (1) composition of expertise (depth and breadth) and (2) the awareness of the location of expertise within the team. Rau posited that the relationship between the TMS dimension and team performance would be moderated by relationship conflict and trust. Specifically, she proposed that the location dimension of team transactive memory would have a less positive effect for teams with higher levels of conflict as opposed to lower levels. It was also proposed that the location dimension would have a more positive effect on performance in teams with high trust. Rau found that relationship conflict moderated the location dimension-performance relationship in the hypothesized manner, however the hypothesis that trust would moderate the relationship between knowledge of the location of expertise was not supported.

Conflict

Early theories of the relationship between conflict and team outcomes generally posited a negative relationship between these variables, a view that was supported by empirical findings (Gladstein, 1984, Saavedra, Earley & Van Dyne, 1993; Wall and Nolan, 1986).   However, work by Hollenbeck and colleagues (Hollenbeck Colquit, Ilgen,

LePine, & Hedlund, 1998) and others suggested that low levels of conflict may be beneficial in achieving team outcomes. In the mid 1990s, Jehn (1994, 1995, 1997) developed and began using an instrument that assessed two separate dimensions of conflict: relationship conflict and task conflict. Relationship conflict was defined as "interpersonal incompatibilities…which typically includes tension, animosity and annoyance". Task conflict represents disagreements about " the content of the tasks being performed, including differences in viewpoints, ideas, and opinions.

Jehn proposed that although relationship conflict has a negative effect on performance and satisfaction, task conflict can be beneficial to performance under certain circumstances. She noted that in situations where tasks have a level of complexity, task conflict may improve performance by contributing to the team's deeper deliberation and innovation. Jehn (1995) and others (Van de Vliert & De Dreu, 1994; Amason & Schweiger, 1997) found empirical support for the beneficial effects of task conflict.

De Dreu and Weingart (2003) conducted a meta-analysis of 30 studies that measured relationship and/or task conflict and included measures of team performance, team member satisfaction, or both. Results of the meta-analysis found strong negative correlations between relationship conflict and team performance, and relationship conflict and team member satisfaction. However, the researchers also found strong negative correlations of task conflict with performance, and team member satisfaction. The findings regarding task conflict were counter to the conceptualization of the task-conflict-performance relationship posited by Jehn (1994, 1995, 1997) and others.

De Dreu (2006) suggests that conflict can promote individual creativity and work team innovation. Specifically, he cites research that suggests the positive impact of minority dissent on independent and creative thought (Nemeth & Chiles, 1998;

Gruenfeld, Thomas-Hunt, & Kim, 1998). In his investigation of this phenomenon in two field studies (De Dreu, 2006) he found evidence of a curvilinear relationship between task conflict and team innovation.

In a recent point-counterpoint article, De Dreu (2007) makes a spirited case that the support for beneficial effects of conflict in organizations is weak. Among other criticisms, he points out that the positive functions of conflict are found only under a very narrow set of circumstances, even under favorable conditions a number of serious negative functions can be identified, and the negative functions easily outweigh positive functions.

Trust

Interpersonal trust is one factor that may play an integral role in the interrelationship of team inputs, processes, states and outcomes. Rousseau, Sitkin, Burt and Camerer (1998 p. 395) define trust as "a psychological state comprising the intention to accept vulnerability based upon positive expectations of the intentions or behavior of another".

Several reviews of factors that affect team effectiveness have highlighted the important role of trust. The underlying assumption for most of this interest is that trust has a positive impact on important individual and organizational outcomes. Salas, Sims and Burke (2005) argue that based on the body of team research, there are five core components of teamwork. These components are leadership, mutual performance, monitoring, backup behavior, adaptability, and team orientation. They further suggest that mutual trust is one of three coordinating mechanisms that support the core components. The other two mechanisms are closed loop communication and team

mental models. Salas and colleagues (2005) suggest that a culture of mutual trust plays a key role in supporting the components because it influences how team members interpret each other's behaviors (Simons & Peterson, 2000).

In their review of research and theory relevant to work teams, Ilgen and colleagues (2005) emphasize the role of trust as an important affective mechanism in the forming stage of teams. They suggest that "for team members to trust the team they must feel that the team is competent enough to accomplish their task... and that the team will not harm the individual or his/her interests" (pp. 521). Several studies were cited by these authors to illustrate the positive role of team members' collective belief that they can be effective (Campion et al., 1996; Marks, 1999; Hecht, Allen, Klammer, & Kelly, 2002).

Ilgen and colleagues (2005) also discuss the element of trust that addresses confidence in team members' intentions. They note the discrepancy between the theoretical detail found by Jones & George (1998) theoretical article and the few empirical studies that had examined interpersonal trust-related constructs.

Jones and George (1998) proposed a framework for understanding how trust evolves in organizations and how it influences cooperation and teamwork. They suggest that trust evolves from the interactions among people's values, attitudes, moods and emotions. Jones and George (1998) differentiated between "conditional trust" and "unconditional trust". Conditional trust was defined as " a state of trust in which both parties are willing to transact with each other as long as each behaves appropriately, uses a similar interpretive scheme to define the situation, and can take the role of the other" (p. 536). Unconditioned trust is " an experience of trust that starts when individuals abandon the pretense of suspending belief, because shared values now structure the

social situation and become the primary vehicle through which individuals experience trust" (p. 536).

Jones and George (2005) propose that when an organization needs employees to perform cooperative behaviors that are arduous or time consuming, or require significant personal trust, conditional trust may not be enough to engender the desired behavior. They suggest it is in these situations where unconditional trust is most important because when it exists, people want to perform these acts.

One of the trust-related empirical studies cited by Ilgen and colleagues (2005) was Edmondson's (1999) work on psychological safety. Edmondson defined this concept as a "shared belief that the team is safe for interpersonal risk-taking (pp.354). In a study of fifty one teams in a manufacturing setting, she found that psychological safety was positively related to learning behavior and that learning behavior mediated the relationship between psychological safety and team performance.

Dirks and Ferrin's (2001) review of the literature on trust in organizational settings suggested that there is less empirical evidence for direct positive benefits of trust on organizational outcomes than might have been previously thought. Their work suggests that trust is still an important factor in creating individual relationships and/or organizational climates that facilitate key outcomes such as employee attitudes and behavior and unit performance. However, the principal means by which it achieves this influence is by playing a moderator role between individual/organizational characteristics and the outcomes of interest.

Dirks and Ferrin (2001) posit two propositions to explain the moderator role of trust in organizational settings. First, trust moderates the relationship between motivational constructs and workplace behaviors/outcomes (p. 456). Second, trust

moderates the relationship between a partner's action and the truster's response (p. 459).

Consistent with Dirk and Ferrin's (2001) conclusion that the role of moderator is a principal mechanism by which trust influences team outcomes, several studies have investigated the interactive relationship of trust and other team characteristics. Curseu and Schruijer (2010) conducted two studies investigating the relationship between trust, conflict and team effectiveness. In the first study of 174 student teams, the researchers examined two path models including task conflict, relationship conflict, and trust acting as mediators between diversity and team performance. The models alternated the order of the trust and conflict variables in the hypothesized path. Both models fit the data, though the model with trust as the antecedent of conflict was slightly better. The second study involved a longitudinal investigation with forty nine student teams.

The collective results of the studies support previous findings that trust positively influences team effectiveness (Langfred, 2007; Peterson & Behfar, 2003). Their results also indicate that trust moderates the relationship between task conflict and relationship conflict such that the relationship between the two is highest when team trust is low. Lastly , it suggests that in situations where trust emerges early in the life of a team, it is likely to reduce conflict experienced at later stages.

Peterson and Behfar (2003) examined performance feedback, task conflict, and relationship conflict in a longitudinal study of sixty-seven groups. These researchers found that negative initial performance feedback leads to subsequent increases in task and relationship conflict, but that negative effect is mitigated somewhat in groups with high levels of early conflict.

One could also make the case that the impact of the team's goal commitment on its level and/or type of conflict may well be influenced by the level of trust within the

team. In situations where there is high trust, high levels of commitment may lead to increased task related conflict. In this case, team members feel more compelled to share conflicting views because they believe in the goal and/or feel comfortable that they can share these conflicting views in this "trusting environment." On the other hand, even though individuals are truly committed to the goal and believe that their dissenting view is the correct one, they may be reluctant to share it, due to their lack of trust in their fellow team members to respond in a way they feel appropriate.

There has been some support for a moderator effect of trust as relates to team conflict. Simons and Peterson (2000) found that intragroup trust moderated the relationship between task conflict and relationship conflict. Specifically, in situations where trust was low, high levels of task conflict were associated with high levels of relationship conflict. However, when trust was high there was only a weak relationship between task conflict and relationship conflict. Their explanation for the finding was that in situations where trust is low, team members are more apt to perceive legitimate discussion of conflicting views on substantive issues (i.e. task conflict) as being personal. They are therefore more apt to subsequently respond with the type of personal attack and dislike associated with relationship conflict.

The above findings and rationale of a moderator role for trust have implications for how conflict may be expected to influence important team outcomes. Specifically, the proposed benefits of task related conflict on team effectiveness may be more likely to occur in situations where there is a high level of trust between the parties. Further, the prevalence of relationship conflict, and the negative impact of that relationship conflict on team outcomes, may well be greatest when trust between the parties is low.

Goal Commitment

Research investigating the impact of goal setting on performance has indicated a positive relationship between the two at both the individual and group level (Locke & Latham, 1990, 2002; O'Leary-Kelly, Martocchio & Frank, 1994). Goal setting theory suggests that "goal commitment is a necessary condition for goal setting to work" (Hollenbeck & Klein, 1987, pp. 219). Hollenbeck and Klein define goal commitment as the determination to try for a goal and an unwillingness to abandon or lower that goal. In teams, goal commitment implies that team members feel an attachment to the team goals and are determined to reach those goals (Weldon & Weingart, 1993).

Aube and Rousseau (2005) note that although there have been some studies have examined the relationship between team goal commitment and team performance (Hecht, Allen, Klimmer & Kelly, 2002; Hyatt & Ruddy, 1997) this area of research is still in the early stage of development. Aube and Rousseau (2005) examined the relationship between goal commitment and performance in seventy-four teams and found that team commitment was positively related to team performance, the quality of group experience and team viability. These researchers also found that task interdependence moderated the relationship between goal commitment and the team performance criteria. Specifically, the relationship between goal commitment and team effectiveness was stronger at higher levels of task interdependence. There was no moderator effect for the quality of group experience or team viability criteria.

Aube and Rousseau (2005) also found that supportive behaviors mediated the relationship between the goal commitment-performance and the goal commitment – quality of group experience relationships but not the goal commitment –team viability relationship.

Performance Feedback

Knowledge of performance outcomes has generally been investigated from the standpoint of the availability of performance feedback. Performance feedback has a well documented relationship with performance at the individual level (Kluger and DeNisi, 1996). Nadler (1979) documented an impact of feedback at the team level. He reported that group level feedback resulted in improved attitudes toward the team, whereas individual level feedback resulted in performance improvements for the team. Similarly, DeShon et al (2004) found that teams receiving team level feedback performed better than teams receiving feedback on individual performance, or those receiving individual and team oriented feedback.

While Kluger and DeNisi, (1996) and Nadler (1979) suggest benefits of performance feedback, they do not address the role of conflict. However, there are a small number of studies that have investigated both feedback and conflict. In one such study, Peterson and Behfar (2002) examined the role of initial feedback, trust, and conflict in groups and found that negative feedback leads to increases in both task and relationship conflict. They also found that establishing early intragroup trust tends to mitigate some of the detrimental effects of negative feedback on subsequent conflict.

Peterson and Behfar (2002) discussed their results in terms of the detrimental impact of negative performance feedback on the group's self-efficacy, which then affects subsequent conflict and performance. They describe conflict- efficacy- performance spirals that progress upward or downward dependent upon the whether the initial feedback was positive or negative.

However, the Peterson and Behfar (2002) study did not investigate situations where groups received no interim performance feedback. The argument can be made that absence of feedback, should be detrimental to teams in the sense that it robs the

team of any credible information upon which to assess progress, make adjustments, and develop collective efficacy. As relates to team conflict, the provision of sufficient performance feedback may help to inform and guide the discussions and decisions related to the substantive issues facing the team. In addition, to the extent the feedback is timely, it may also minimize the commitment of resources (time, emotion, material, etc.) to an incorrect course of action, thus reducing the development of non-productive conflict and blame placing when individuals and/or the team feels that time/effort has been wasted.

Summary of Literature Review

The review of literature related to the key variables investigated in this study provides a substantial framework for the appropriateness of investigating the variables examined in this study, as well as the approach to doing so. The contemporary team effectiveness models and reviews of the team effectiveness literature (Ilgen, et al, 2005; Salas et al, 2005; Marks et al, 2001) support the examination of the type of emergent state, team process and team outcome variables investigated in this study. Similarly, the role of team conflict as a mediating team process and the role of trust as an emergent state that potentially influences key team outcomes by moderating the effects of emergent states and processes are consistent with the overall team effectiveness frameworks, as well as the specific existing research regarding these two variables (De Dreu & Weingart, 2003; Dirks & Ferrin, 2001).

The literature on team cognition structures in general (DeChurch & Mesmer-Magnus, 2010) and transactive memory systems in particular (Peltokorpi, 2008) document a strong relationship to team processes and outcomes. However, the growing

but still relatively small amount of research on transactive memory systems in field settings suggests the desirability of additional research in this area. Similarly, although there has been substantial investigation of the roles of goal commitment and performance feedback at the individual level, these potential relationships could benefit from investigation at the team level (Aube and Rousseau, 2005; Nadler, 1979; DeShon et al, 2005).

Hypotheses

Emergent States – Team Conflict

HI. Team trust will moderate the relationship between Goal Commitment, Transactive Memory, Team Role Knowledge, Performance Feedback and Team Conflict.

H1. As relates to the Emergent State variables and Task Conflict: There will be a stronger positive relationship between the Emergent States and levels of Task Conflict in teams where there is high trust, than there will be in low-trust teams.

H2. As relates to the Emergent State variables and Relationship Conflict: In high trust teams there will be a negative relationship between Transactive Memory and Relationship Conflict, between Goal Commitment and Relationship Conflict, as well as Role Knowledge and Relationship Conflict. However, in low trust teams Transactive Memory, Goal Commitment, and Role Knowledge will not be related to relationship conflict.

H2a. In high trust teams, there will be a negative relationship between Performance Feedback and Relationship Conflict. In low trust teams, Performance Feedback and Relationship Conflict will be positively related.

Task Conflict and Team Outcome Measures

H3. Trust will moderate the relationship between Task Conflict and the Team Outcome Variables (Performance, Member Satisfaction, and Innovation). In high trust groups there will be a positive relationship between Task conflict and Team Outcomes. In low Trust Groups there will be a negative relationship between Task Conflict and Team Outcomes.

H4. Trust will moderate the relationship between Relationship Conflict and Team Outcome Variables (Performance, Member Satisfaction, and Innovation). In high Trust groups there will be a moderate negative correlation between Relationship Conflict and Team Outcomes. In low Trust groups there will be a stronger negative correlation between Relationship Conflict and Team Outcomes.

Role of Conflict in the Emergent State - Team Outcome Relationships

H5. It is hypothesized that conflict will serve as a mediator variable between the Emergent State variables and the Team Outcome variables, Innovation and Performance.

Chapter 3

METHOD

Participants

Study participants consisted of 231 members of thirty-three (33) work teams from organizations in the Washington, DC region. The teams were recruited from organizations in the Washington DC area and consisted almost exclusively of teams from local municipal governments (31 teams). However, the sample did include one private sector and one academic team, as well. All were formal work teams. The teams represented a variety of functional areas, hierarchical levels, and organization sizes. The sample also consisted of a mix of teams from urban and suburban settings.

Team size among the original thirty-three teams ranged from 3 to 34 members. In all but one instance, the number of team members participating in the study represented at least 60% percent of the total team. Twenty seven of the teams had participation rates of 70% or greater, with the mean participation rate being 88% (sd = .17).

Based upon participation rate and team size, it was decided to exclude two teams from further analysis. The team with the lowest participation rate (40%) was dropped from the sample. Also, the largest team (34 members) was dropped from the analysis, since it was almost twice the size of the next largest team (18 members). As a result of the removal of these two teams, the final sample consisted of thirty-one teams with a mean team size of 7.45 (sd = 4.38) and a mean participation rate of 90% (sd=.15). Team size in the final sample ranged from 3-18 members.

Approximately 16% of the participants had been with their team for less than a year, approximately 23% had been with their team for 1 to 2 years, and approximately 56% had been with their team for 3 or more years. Approximately 5% of the participants did not indicate their tenure.

Procedure

Permission was sought and received from one large municipality and a regional planning group to contact alumni of their management development programs to invite their participation in the study. Similarly, a variety of other private and non-profit organizations were contacted to inquire regarding their interest in participating in the study. As part of participation in the study, teams and leaders were eligible to receive feedback regarding their team or leadership characteristics at a later date.

Once approval was received, the researcher scheduled a data collection session with the participating team. During the session, the researcher explained the purpose and procedures of the study and provided informed consent materials to the participants. Team members were asked to refrain from including identifying information on the questionnaires and were told that the only persons that would see individual surveys were the researchers. They were also informed that all data would be handled confidentially. The team members then completed the fifty-four item Team Questionnaire, which is described below. The team data collection meetings generally lasted from 20-30 minutes.

The vast majority of participants completed the Team Questionnaire in the data collection sessions. If for some reason all team members were not able to attend the data collection meeting, questionnaires and self-addressed stamped envelopes were left with

the team leader to be given to the missing members, so that they could complete the questionnaires and mail them to the researcher. Of the small number of participants that were absent from their team's data collection sessions, the bulk of them did subsequently return their questionnaires via the mail.

Measures

The Team Questionnaire used in the study contained items from several tools utilized in previous research, as well as items specifically designed to be used in this study to assess the variables of interest. After initial conversations with leaders in some of the potential participating organizations, several questions were added to the questionnaire in order to enrich the feedback available to the teams after the study. With the exception of two items that addressed Team Interdependence, these items were not included in the analyses. The Team Interdependence items addressed the extent to which participants felt their work affected the work of their teammates and the extent to which they felt their teammates' work affected their own.

The only demographic information collected was team members' tenure with the team. Given the small sizes of some of the teams, it was desirable to minimize any potential concerns regarding possible breaches of confidentiality, therefore, demographic information was limited to this one item. The final questionnaire included one demographic item and 54 Likert scale items addressing characteristics of the team. The principal variables of interest addressed by the survey included Goal Commitment, Transactive Memory Systems, Team Role Knowledge, Performance Feedback, Team Trust, Team Performance, and Team Innovation. The scales/items addressing these

variables are described below. A copy of the Team Questionnaire is included in the Appendix.

Team Emergent State Variables

Goal Commitment: Goal Commitment was assessed by a modified version of several items designed to measure individual goal commitment described in Klein, Wesson, Hollenbeck, Wright, & DeShon, (2001). The items were modified to be more appropriate for team goals. In addition, two new items were added, "I understand the goals of our team" and "We think it is important to reach the team's goal".

Transactive Memory: Transactive memory was measured by Lewis' (2003) Transactive Memory System Scale. The scale contains three subscales which assess the specialized knowledge, credibility, and coordination aspects of Transactive Memory Systems. Specialization refers to the existence of a differentiated structure of team membership knowledge. Credibility entails the extent to which team members feel confident about information provided by their colleagues, Coordination refers to the team's level of effective, orchestrated knowledge processing within the team (Lewis 2003). The Transactive Memory System Scale contains 14 items.

Team Role Knowledge: Team Role Knowledge was assessed via 9 items that addressed team members' knowledge of the roles within the team, including their own and those of other team members. The scale was composed of six items designed to assess role ambiguity relevant to their own role (Rizzo, House and Lirtzman,

1970), as well as three questions that addressed their understanding of the roles, challenges, and contributions of their teammates.

Performance Feedback: Performance Feedback in the teams was assessed through three items created for this study. The items addressed team members' agreement with statements indicating that they received feedback regarding:

--how well they are performing;

--how well the team is performing; and

--how their efforts are contributing to the team's performance.

Moderator/Mediator Variables

Team Trust: Team trust was hypothesized as a moderator of several relationships in the study. It was assessed by a four item Likert scale used in Langfred (2004) and based upon Simons and Peterson's (2000) 5-item scale assessing perceptions of group wide trust among top management teams.

Conflict: Team conflict was measured through Jehn's (1995) conflict survey that assesses Task Conflict and Relationship Conflict dimensions through two four-item Likert Scales.

Team Outcome Variables

The hypotheses concerning team outcomes focused on two self-report measures of team Performance and Innovation, which were assessed as described below.

Team Performance: Team Performance was measured by team members'

responses to two questions:

"At times this team fails to approach its task adequately"; and

"This team consistently accomplishes its performance goals".

Innovation was assessed through team members' responses to two questions:

"This team is good at coming up with ways to complete their tasks"; and

"The team effectively deals with uncertainty and unexpected events".

Scale Reliabilities and Modifications

Cronbach's Alpha was used to assess the internal consistency reliability for all

scales used in the study. The initial reliability analyses were conducted at the individual

participant level.   Examination of the reliability estimates and intercorrelations of

several of the original scales indicated that adjustments should be made to improve their

psychometric properties. These three adjustments to the approach to measuring the

variables of interest addressed the Performance, Transactive Memory, and Conflict

variables.

The adjustment to the team performance measure was necessitated because the

original two-item measure had an unacceptably low internal consistency reliability

estimate (Cronbach alpha = .48). The measure was revised by removing one of the

original items ("At times this team fails to approach its task adequately") and replacing it

with a performance related item from the Coordination subscale of the Transactive

Memory measure ("Our team works well together in a coordinated fashion"). As a result,

team Performance was assessed by the combined responses to "Our team works well

together in a coordinated fashion" and "This team consistently accomplishes its performance goals". The change in the scale items markedly improved the reliability of the Performance measure (from rxx=.488 to rxx=.72). The removal of the item from the Coordination subscale had only a minimal effect on its reliability, leaving the revised Coordination scale with a Cronbach's reliability estimate of .82.

It was also necessary to adjust the approach to utilizing the Transactive Memory measure. The original intent was to use the overall score, but as a result of the initial psychometric analyses there were several concerns with this approach. The revised Transactive Memory Scale score had a Cronbach's alpha estimate of .72, despite being composed of thirteen items. Also, a review of the intercorrelations among the three Transactive Memory subscales indicated that although the Credibility and Coordination subscales were positively correlated (rxy= .62***), neither Credibility nor Coordination was correlated with Specialization. As a result of these factors, the three Transactive Memory subscales were used in subsequent analyses, as opposed to using the overall Transactive Memory score.

The last adjustment addressed the measure of team conflict. The initial research plan focused upon investigating the Task Conflict and Relationship Conflict subscales separately, however the high correlation between the two (rxy=-.84***) suggested that it would be more appropriate to use the overall Team Conflict score in the analyses.

The Cronbach alpha estimates calculated at the individual and team levels, as well as the number of items for the final versions of each scale are listed in Table 3.1.

SCALE	Number of Items	Cronbach's Alpha Reliability Individual Level (n=231)	Cronbach's Alpha Reliability Group Level (n=31)
Goal Commitment	5	.86	.90
Transactive Memory*	13	.73	**
Specialization subscale	5	.62	.76
Credibility subscale*	4	.73	.83
Coordination subscale	4	.82	.91
Knowledge of team roles	9	.84	.88
Performance Feedback	3	.89	.91
Total Conflict	8	.94	.97
Task Conflict	4	.96	**
Relationship Conflict	4	.87	**
Trust	4	.89	.95
Performance*	2	.72	.84
Innovation	2	.71	.76
Interdependence	2	.78	.80

* = Modified from original as indicated in Measures section
** = Team level reliability not reported because variable was not used in team analyses

Table 3-1 Scale Reliability Estimates

Chapter 4

RESULTS

Appropriateness of Analysis at the Team Level

Within-group agreement (Rwg) analyses were conducted to confirm the appropriateness of team level analysis of the data. These analyses were conducted via the approach described in LeBreton and Senter (2008). Traditionally, a cutoff value of .70 has been advocated to determine the appropriateness of data aggregation (Lebreton et al, 2003; Lance, Butts, and Michels, 2006). However, LeBreton and Senter (2008) suggest a continuum to guide decision makers in making this determination. The continuum ranges from Lack of Agreement (values ranging from 0 - .30) to Very Strong Agreement (values ranging from .91 – 1.0).

Analyses of within group agreement (Rwg) were conducted for each of the variables of interest in the study. The median Rwg value was .90 with 84.5% of the values falling above .70 (i.e. in the Strong Agreement or Very Strong Agreement range). As a result of the strong agreement levels, aggregating data to the team level was deemed appropriate.

Descriptive Statistics for Team Questionnaire

Descriptive statistics for the team Questionnaire Scales are provided in Table 4.1. Completed survey data was analyzed for 31 teams. All scale scores represent the sum of the responses to the items within the scales.

Scale/Item	Mean	SD
Goal Commitment	21.8	1.8
Transactive Memory		
Specialization	19.8	2.2
Credibility	15.7	1.5
Coordination	15.4	2.0
Team Role Knowledge	51.1	4.0
Performance Feedback	10.6	1.6
Team Trust	28.9	4.7
Team Conflict	25.0	10.8
Relationship Conflict	11.7	6.5
Task Conflict	13.3	4.8
Innovation	8.4	0.8
Performance	7.6	0.9
Interdependence	6.2	1.0
Team Size	7.7	

All scale scores represent the sum of the responses to the items within the scales

Table 4-1 Descriptive Statistics for Team Survey Variables

Correlations

The matrix in Table 4.2 provides the correlations for the variables of interest. Almost all correlations among the variables of interest were statistically significant, the

exceptions being most of the relationships involving the Specialization variable, and the relationship between Coordination and Performance Feedback. Excluding the non-significant relationships mentioned above, the magnitude of the correlations among the independent and moderator variables ranged from approximately .40 to .62, with the notable exceptions being three correlations in the .70 range (Team Role Knowledge and Goal Commitment, (r = .69, p<.001); and Team Role Knowledge and Performance Feedback (r =.71, p<.001); and Coordination and Trust (r=.76, p<.001).

As mentioned earlier, Task and Relationship Conflict were very highly correlated (r=.84, p<.001). As a result of the high correlation, the overall scale score Team Conflict was used in all subsequent analyses. Team Conflict was negatively correlated with all variables of interest except Specialization. The team outcome variables, Innovation and Performance were strongly correlated with one another (r= .66, p<.001).

Three team characteristic variables, Team Size, Team Member Tenure, and Team Interdependence, were examined , although they were not part of the study hypotheses. Although these variables are sometimes found to be correlates of team dynamic and outcome variables, they were generally unrelated to the variables of interest or with each other. The only significant correlations were between Team Size and Performance Feedback (r=-.42, p<.05) and Team Interdependence and Goal Commitment (r=.45, p<.05).

The magnitude and consistency of the correlations, combined with the fact that the study data were collected via a single instrument raises concerns about method variance being a factor in the observed relationships. Ultimately, they also provoked concern regarding the potential for multicollinearity issues in the regression analyses used to evaluate the hypotheses.

	Goal Commitment	Coordination	Credibility	Specialization	Total Role Knowledge	Performance Feedback	Task Conflict	Relationship Conflict	Team Conflict	Innovation	Performance
Team Size											
Team Tenure											
Inter-dependence											
Goal Commitment	1.00										
Coordination	.61	1.00									
Credibility	.60	.62***	1.00								
Specialization	-.30	-.35	-.23	1.00							
Total Role Knowledge	.70***	.59***	.47	-.40*	1.00						
Performance Feedback	.42	.27	.42	-.24	.71***	1.00					
Task Conflict	-.66***	-.68***	-.64	.24	-.76***	-.55	1.00				
Relationship Conflict	-.71***	-.71***	-.73	.31	-67***	-.51**	.84***	1.00			
Team Conflict	-.72***	-.73***	-.73	.29	-.74***	-.55**	.95***	.97***	1.00		
Innovation	-.50**	.65***	.80	-.24	.45*	.46*	-.56***	-.74***	-.70***	1.00	
Performance	.57***	.87***	.47	-.44*	.63***	.31	-.58***	-.67***	-.66***	.66***	1.00
Team Trust	.56***	.76***	.62	.30	.46**	.53**	-.57***	-.73***	-.70***	.72***	.73***

Level of significance: * = at the p < .05 level   ** = at the p < .01 level   *** = at the p <.001 level

Table 4-2 Association between subscale variables of Team Survey (n=31

Hypothesis Tests

Hierarchical multiple regression was used to evaluate the study hypotheses involving the relationships of Goal Commitment, Specialization, Coordination, Credibility, Role Knowledge, and Performance Feedback with team Conflict. Trust, the hypothesized moderator variable, was entered into the equation as part of an interaction term with each predictor of interest in the various regression models. The sequence of variable entry into the equation involved first entering Trust into the equation alone to control for any main effect, then entering the predictor variables together to examine any of their main effects when controlling for each other, and lastly, entering the block of interaction effects. In order to control for multicollinearity between the main and interaction terms, all independent variables were centered by subtracting the variable mean from all observations. Consistent with Aiken and West's (1991) recommendation, in instances where a significant interaction effect was found, regression lines were plotted to illustrate the nature of the relationship between the independent and dependent variable at different levels of Trust (i.e. -1 and +1 sd from the mean).

Role of Emergent States and Trust in Team Conflict

Hypothesis 1 predicted that team Trust would moderate the relationship between Goal Commitment, Transactive Memory, Team Role Knowledge, and Performance Feedback with Task Conflict, while hypothesis 2 and 2a predicted that team Trust would moderate the relationship between these predictors and Relationship Conflict. Given the need to use the overall Total Conflict measure instead of the Relationship Conflict and Task Conflict subscales, these specific hypotheses could not be investigated. However,

the extension of the hypotheses to the case of overall Team Conflict, (i.e. Team Trust would moderate the relationship between the constructs indicated above and Team Conflict) was tested. In addition, the Transactive Memory subscales were investigated as predictors instead of the overall Transactive Memory score.

As shown in Table 4.3, the hypothesis that Trust would moderate the relationship between the emergent state variables and Team Conflict received partial support. There was a significant interaction effect of Credibility X Trust (β= .47, p<.01) as well as a significant interaction effect for Performance Feedback X Trust (β= -.47, p<.01). There was also a significant main effect of Trust on Team Conflict (β= -.45, p<.05). None of the other interaction effects were statistically significant. Each of the three models contributed to a significant increase in R^2 resulting in 92% of the variance in Team Conflict being explained by the terms in model 3 (p<.001).

The significant interactions were examined by creating graphs of the relationships between the independent and dependent variable of interest at different levels of Trust (-1 and +1 sd from the mean of Trust), in order to assess whether the observed relationships were consistent with the hypotheses (Aiken and West, 1991). The X (predictor) values chosen for the regression equation were -1 and +1 sd. from the predictor mean.

As Figure 4.1 indicates, at high levels of Trust there appears to be only a minimal appeared to be a strong negative relationship. An analysis of the simple slopes for the regression of Team Conflict at low and high levels of Trust indicated a significant negative relationship at low levels of Trust (b=-5.24, p<.01) while the relationship between Credibility and Team Conflict at high levels of Trust was not statistically significant (b=1.68, ns).

Emergent State	Model 1		Model 2		Model 3	
	β	t	β	t	β	t
Team Trust	-.69	-5.05***	-.13	-.61	-.45	-2.42*
Goal Commitment			-.07	-.46*	-.06	-.37
Coordination			-.21	-.99	.18	.85
Credibility			-.28	-2.07*	-.24	-1.61
Specialization			-.04	-.42	-.01	-.074
Role Knowledge			-.45	-2.24*	-.25	-1.38
Performance Feedback			.03	.16	-.08	-.54
Goal Commitment X Team Trust					.13	1.0
Coordination X Team Trust					-.18	-1.51
Credibility X Team Trust					.47	3.34**
Specialization X Team Trust					-.07	-.61
Role Knowledge X Team Trust					.28	1.39
Performance Feedback X Team Trust					-.47	-3.31**
R^2	.48***		.81***		.92***	
F	25.49		13.8		14.24	
$R^{2change}$			.34***		.11*	
F^{change}			6.7		3.6	
*p < .05, ** p < .01, *** p <.001						

Table 4-3   Regression Results with Team Conflict as the Dependent Variable
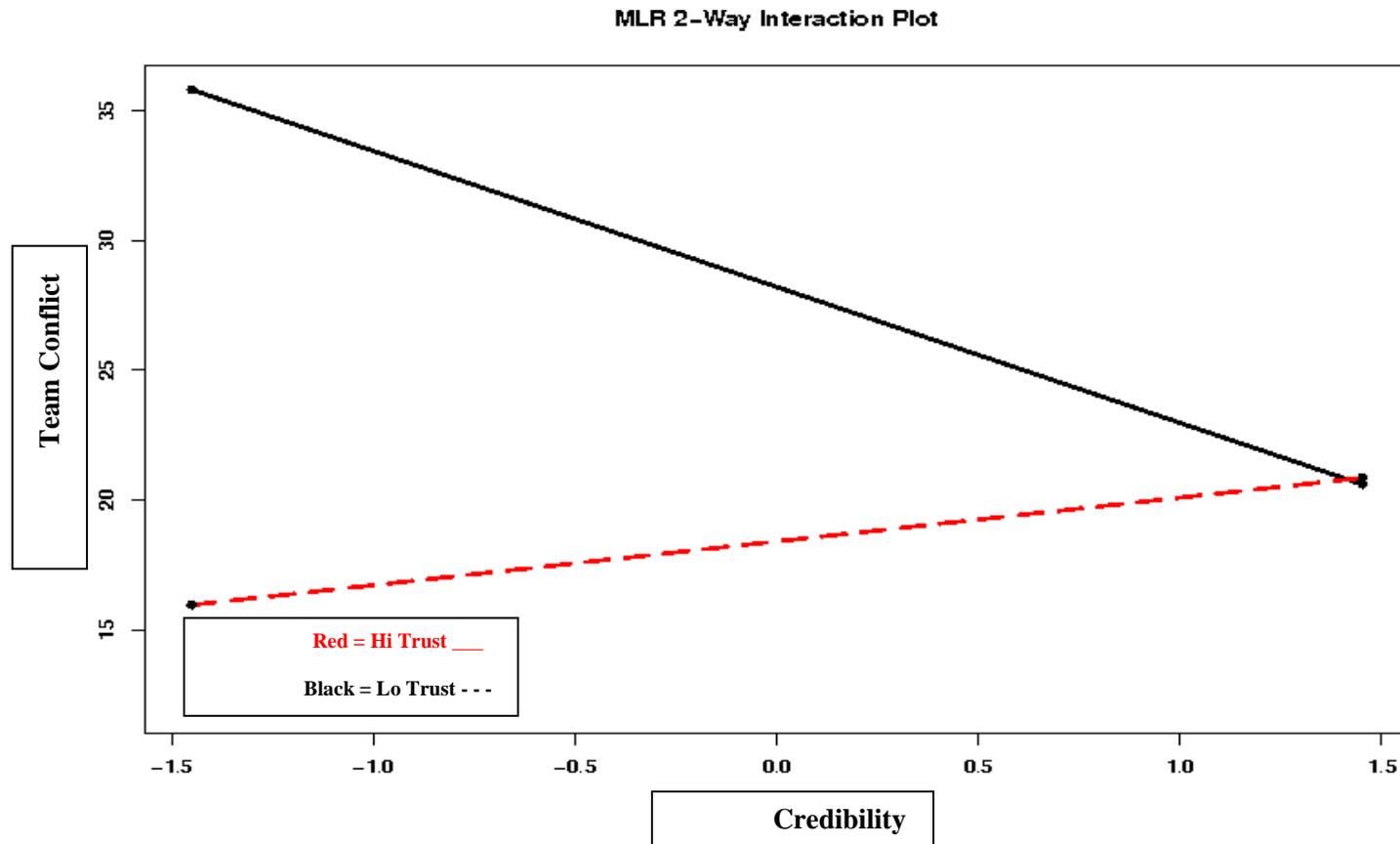
Figure 4-1 Credibility X Trust Interaction on Team Conflict

Figure 4.2 depicts the interaction effect of Performance Feedback and Trust on Team Conflict by graphing the regression lines of the relationship between Performance Feedback and Team Conflict at high and low levels of Trust. The graph suggests a negative relationship between Performance Feedback and Team Conflict at high levels of Trust, but a positive relationship between Performance Feedback and team Conflict at low levels of Trust. Tests of the slopes indicate a negative relationship between Performance Feedback and Team Conflict at high levels of Trust (b= -3.59, p<.05) but that the relationship between Performance Feedback and Team Conflict at low levels of Trust does not reach statistical significance (b= 2.47, p=.067).

Role of Conflict and Trust in Team Outcomes

Hypotheses 3 and 4 predicted that Team Trust would moderate the relationship between Task and Relationship Conflict and the two team outcomes, Innovation and Performance. Similar to the hypotheses regarding the impact of the emergent variables on Task and Relationship Conflict, the specific hypotheses regarding the relationship of the Conflict subscales and the Team outcomes cannot be directly assessed. However, the hypothesis that Trust would moderate the relationship between overall Team Conflict and the team's Innovation and Performance was tested via multiple regression models.

There was a significant interaction between Team Conflict and Trust on the Innovation variable (β= .374, p<.01). There was also a significant main effect of Trust on Innovation (β= .544, p<.001). As indicated in Figure 4.3, the graph of the relationship between Team Conflict and Innovation at high and low levels of Trusts suggest that there is little relationship between Team Conflict and Innovation at high levels of Trust, but
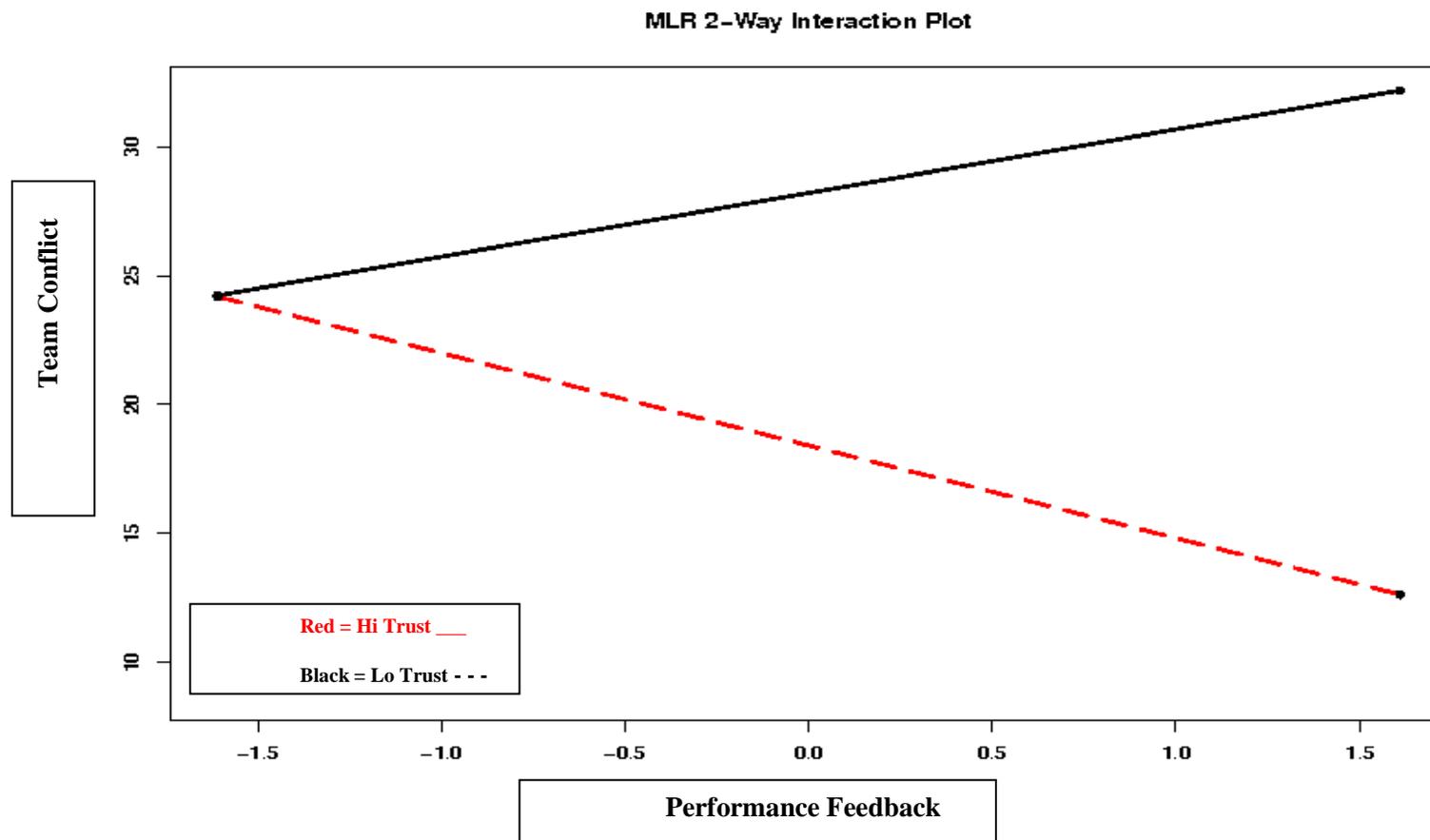
Figure 4-2 Performance Feedback X Trust Interaction on Team Conflict

MLR 2-Way Interaction Plot

Innovation

Team Conflict

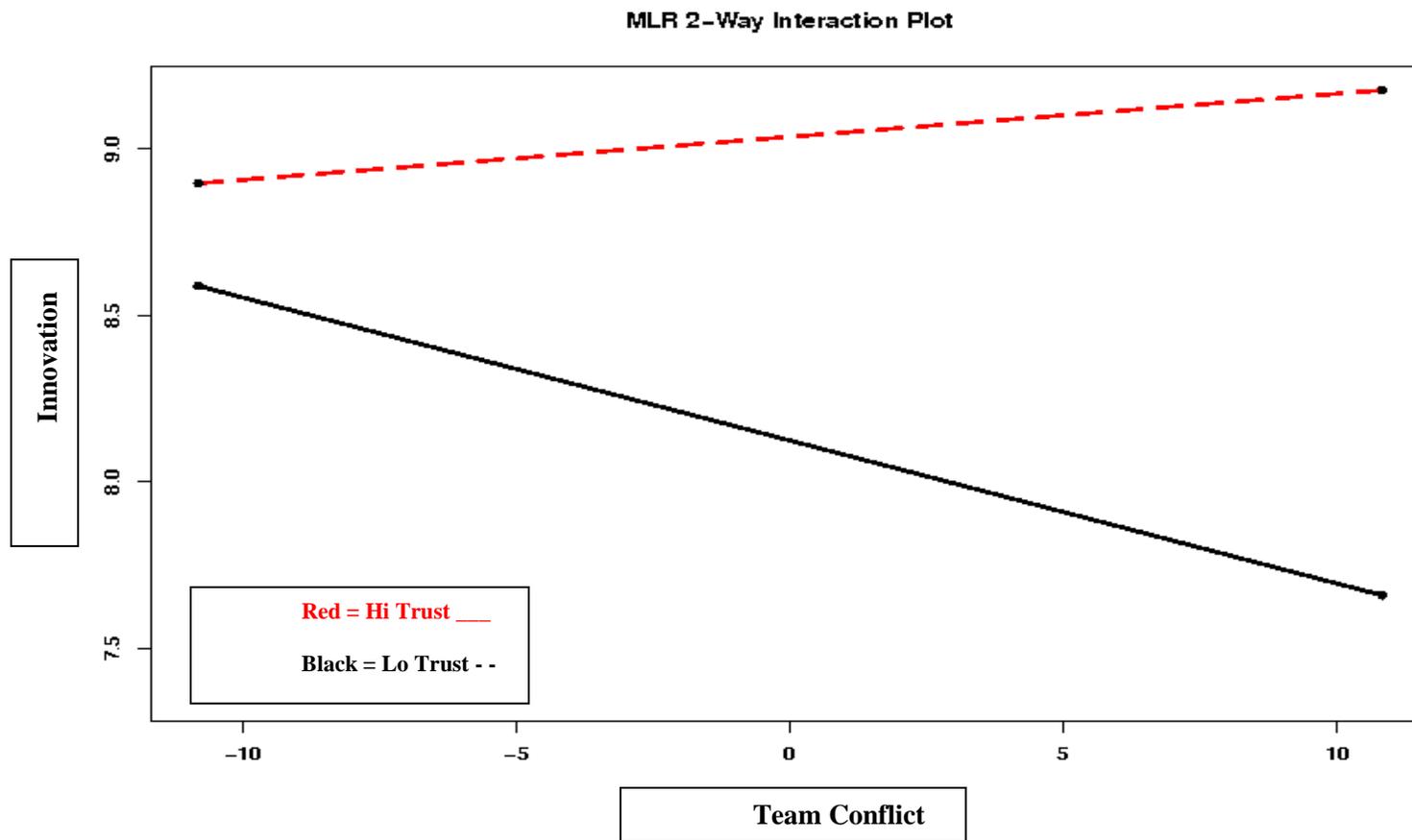Red = Hi Trust ___

Black = Lo Trust - -

Figure 4-3 Team Conflict X Trust Interaction on Innovation

that Team Conflict is negatively related to Innovation when there is a low level of Trust within the Team.

Tests of the simple slopes of the two regression lines indicated a significant negative relationship between Team Conflict and Innovation at low levels of Trust (b=-.04, p<.01), but no relationship between the two variables when Trust is high (b=.01, p= ns).

Results of the regression of Team Performance on Team Conflict and Trust did not yield a significant interaction effect. However, Trust was positively related to Performance (β =.543, p<.01). The complete results of the Performance and Innovation regressions are reported in Tables 4-4 and 4-5.

Conflict as a Mediator of the relationship between Emergent State and Outcome Variables

Hypothesis 5 predicted that Conflict would serve as mediator variable between the emergent state variables and the two team outcomes, Innovation and Performance. The existence of a mediator role for Team Conflict in this relationship was evaluated through the bootstrapping technique described in Preacher and Hayes, (2008). This approach has greater statistical power than the commonly used Baron and Kenny (1986) approach. It also is more appropriate than the Sobel approach (Sobel, 1982), due to the small sample size in this study.

The mediation analyses evaluated the role of Team Conflict as a mediator of the relationship between each predictor and the team outcome variables (Innovation or Performance), while controlling for the effects of the other predictors. A value of 5000 samples was selected for the number of random samples to be drawn in the bootstrapping process. A 95% confidence interval was used to evaluate the significance

of the effect for each predictor. There were no significant mediation effects of Team Conflict on the relationships between any of the predictors and team Innovation or Performance.

Emergent State	β	t
Team Trust	.54	3.13**
Team Conflict	-.25	-1.36
Total Conflict X Team Trust	.11	.80

$*p < .05,$ $** p < .01,$ $*** p < .001$

Table 4-4 Regression Results with Innovation as the Dependent Variable

Emergent State	β	t
Team Trust	.54	3.75**
Team Conflict	-.19	-1.23
Total Conflict X Team Trust	.37	3.34**

$*p < .05,$ $** p < .01,$ $*** p < .001$

Table 4-5 Regression results with Performance as the Dependent Variable

Chapter 5

DISCUSSION

The goal of this study was to examine the roles played by several team emergent states and processes in influencing key team outcomes. Specifically, hypotheses were proposed as to how several emergent states (Goal Commitment, Knowledge of Team Roles and Transactive Memory Systems and Performance Feedback) affect Team Conflict and as a result, team effectiveness (Performance and Innovation). Hypotheses were also made surrounding the role that Team Trust plays in the nature of the relationships between emergent states/processes and Team Conflict, as well as Team Conflict and team outcomes. The hypotheses posited in the study received mixed support.

It was hypothesized that Team Trust would moderate the relationship between the emergent state predictors and Team Conflict. It was also hypothesized that Trust would moderate the relationship between Conflict and team outcomes (Performance and Innovation). Lastly, it was hypothesized that Team Conflict would play a mediator role between the team emergent states and Team outcomes.

Due to psychometric issues that required the analysis of overall Team Conflict instead of the Relationship and Task Conflict subscales, several of the hypotheses involving the subscales could not be tested. However, the moderating role of Trust on the relationship between the emergent state-Conflict, and Conflict-team outcomes relationships was tested via overall Team Conflict. The hypothesized mediating role of conflict in the relationship between the emergent states and team outcomes was also assessed via overall Team Conflict as opposed to Task and Relationship Conflict.

In addition to the adjustment in the assessment of conflict, it was also necessary to adjust the approach to the Transactive Memory scale from using the overall scale measure to the use of the Specialization, Coordination, and Credibility subscales.

The hypothesized moderator role of Team Trust was partially supported. The findings indicated that Trust moderated the relationship between the level of perceived Credibility of team member information and Team Conflict. Trust also moderated the relationship between Performance Feedback and Team Conflict. The hypothesis was not supported relative to the relationship of Trust with the other emergent states. The hypothesized moderator role of Trust in the relationship between Team Conflict and team outcomes was also partially supported. Trust did not moderate the relationship between Team Conflict and Performance, but did moderate the relationship between Team Conflict and Innovation. Lastly, it was hypothesized that Team Conflict would mediate the relationship between the emergent state variables and Team Performance and Innovation. This hypothesis was not supported.

Explanation of Findings

Credibility

In regard to Team Conflict, the impact of Credibility depended upon the level of Trust within the team. In high Trust teams, the relationship between Credibility and Team Conflict is negligible. This could be due to the fact that the benefits conveyed when information shared within the team is viewed as credible are already in effect as a result of a high overall Trust level, or perhaps there is a reduced variability on Credibility

across high Trust teams, thereby shrinking the likelihood of finding a significant

difference.

However, there is a strong negative relationship between Credibility and Team

Conflict at lower levels of Trust. This suggests that perhaps the existence of a common

perspective that team member information is credible helps to overcome the otherwise

debilitating effects of a low trust environment. This could be a useful team improvement

tool given Conflict's consistent negative relationship with other important team and

individual outcomes.

Performance Feedback

The relationship between Performance Feedback and Team Conflict was

moderated by the level of Trust within the team. The finding was consistent with the

study hypothesis that at high levels of Trust, there will be a negative relationship

between Performance Feedback and Relationship Conflict, but at low levels of Trust,

increased Performance Feedback will be associated with higher levels of Relationship

Conflict. This finding may be interpreted as there being a certain level of Trust necessary

for teams to hear and effectively use Performance Feedback.   Low levels of Trust may

result in Performance Feedback being viewed suspiciously or even resented. When there

is sufficient team Trust, there may be increased opportunity for the informative and

cohesion building aspects of performance feedback to occur.

One key element in understanding the Performance Feedback results in this

study is the fact that a "more is better" approach was taken in the assessment of

Performance Feedback within the study teams. The type or quality of the feedback was

not differentiated. Instead, the study looked at the reported level of feedback in a manner that incorporated feedback on individual performance, team performance, and one's individual connection to team performance. Therefore, different types of feedback may be reflected in a participant's response. Likewise, there was no attempt to differentiate the quality of the feedback, so there was no way to know if the impact of Performance Feedback was in any way linked to its quality.

Role of Trust

The findings from the study provide selective support for the hypothesized moderating effect of Trust on the emergent state -- Team Conflict relationship and the relationship between Team Conflict and team outcomes. No moderating effect was observed in the relationship between several of the emergent state variables and Team Conflict, or between Team Conflict and Performance.   However, the finding of a moderating effect for Trust in the relationships between Credibility and Team Conflict, Performance Feedback and Team Conflict, as well as between Team Conflict and Innovation suggests Trust plays a key role in determining how team mechanisms operate.   Further, when combined with the finding of a significant positive relationship between Trust and Performance, it is clear that Trust is a critical element in understanding and predicting team effectiveness.

The nature of the Trust interactions found in the study suggests an important and potentially multidimensional role for Trust in teams. To use a medical analogy, Trust may play the role of inoculator, salve and booster. The finding of no relationship between Credibility and Team Conflict at high trust levels might be interpreted as the presence of high Trust serving to shield (or inoculate) teams from the ill effects of low

credibility information sharing. Conversely, in low Trust teams, the negative

relationship between Team Conflict and Credibility may suggest that one approach to

addressing team effectiveness issues in where the information credibility is low and

conflict is high may be to integrate trust building efforts into strategies to build more

credible information sharing networks.

The finding of a positive relationship between Trust and Performance is

consistent with previous findings of the positive of impact of trust on team effectiveness

and theories of advocating this relationship (Jones & George, 1998). Further, the finding

of main and moderator effects of Trust on the variables investigated in the study suggests

pervasive direct and indirect effects of Trust, with the importance of trust n interesting

conflict-driven approach for addressing team satisfaction and morale issues.

Team Conflict

Results of the correlations for Team Conflict show a consistently negative

relationship with all other team characteristics and outcomes. This reinforces multiple

findings of the detrimental nature of Team Conflict (De Dreu and Weingart, 2003) and is

consistent with De Dreu's (2008) recent pessimistic perspective regarding any potential

benefits of Conflict. However, the finding of the moderating role played by Trust in the

relationship between Team Conflict and Innovation is in part due to the lack of a

detrimental impact of Conflict in high Trust situations. This finding provides additional

support for the notion that there are circumstances, although perhaps somewhat limited

circumstances, in which Conflict is not detrimental to organizational teams. It also is

consistent with previous research suggesting a moderating effect of trust on the

relationship between conflict and team outcomes.

Research Implications

Emergent States

Over the past decade, there has been increasing attention to the identification of emergent states and their antecedents and impacts in teams (Salas and Fiore, 2004, DeChurch and Mesmer-Magnus, 2010). The current research contributes to this trend in the sense of providing additional support for the notion that emergent states play an important role in teams, as well as information regarding the mechanism by which that role is manifested.

Applied Implications

Leading Teams

There are two principal practice implications for this research. First, the emergent state constructs chosen as the independent variables in the study (Goal Commitment, Team Role Knowledge, Transactive Memory System and Performance Feedback) were selected for two reasons. One, they were viewed as potentially important characteristics in determining team effectiveness. Two, they are characteristics on which the team leader is likely to be able to exert some influence. For example, the provision of feedback is a key role of the team leader. Similarly, the leader may play an important role in ensuring that the task related-information shared between staff is credible. The study's findings of the impact of these variables on Team Conflict highlight the need for leaders and organizations to attend to them. The fact that they can be addressed at the local level will hopefully increase the likelihood that this will occur. The finding that trust

moderates the relationship also may highlight an avenue available to leaders to utilize in doing so.

Team Interventions

The second practice application involves the development and implementation of team efforts or interventions. The relationships documented in this study may prove useful in finding ways to address difficult team challenges. For example, the findings highlight the key role of Trust in teams and the mechanisms by which its effect may take place. This may be useful in stimulating the incorporation of elements of "trust building" as part of, or even before other interventions to address team effectiveness, by means such as improving performance feedback.

Similarly, the positive relationship between Trust and Performance and the influence of Trust on the impact of Team Conflict on Innovation may encourage organizations to be more proactive in these types of efforts and view fostering Trust in teams not as an optional "feel good" activity, but as a core element of supporting the team's performance.

Limitations of the Present Study

There are several methodological factors that may have served to limit the study's effectiveness or generalizability. First, although the study was originally designed to include multiple data collection methods, (e.g. data from team leaders and customers) logistical issues precluded the opportunity to employ them. As a result, all of the study's

data were collected from each team at one time and through one self-report instrument, which can create concerns regarding the potential for method variance. Second, perhaps in part as a result of the measurement issues previously stated, there was substantial correlation among the five independent variables, which resulted in some multicollinarity in the regression equations. Lastly, the sample size was significantly smaller than originally planned, which affected the statistical power of the study.

These issues, particularly the potential method variance, may raise some concerns regarding the meaningfulness of the study's results. However, there are a few additional factors worth considering in this assessment. First, although it would have been desirable to have dependent data that was collected from other sources (e.g. performance outcomes, customer ratings, etc.); it would seem that the team members' perspective would be a logical source of input on variables such as the level of conflict and innovation within the team. Second, the logistical issues (e.g. sample size) led to some outcomes that actually reduced the likelihood of finding a significant effect. Lastly, the findings observed in the study may very well serve, in the context of related research, as effective indicators of promising relationship that should be investigated by means that afford better indications of causality of the relationships. This may be either by experimental methods or through field studies with sufficient sample size to utilize techniques such as structural equation modeling. In any event, the study does cast light on some interesting and potentially beneficial relationships.

Future Research

There are at least three areas that could profit from additional research efforts. First, as mentioned by previous researchers the continuance of increased attempts to

investigate team cognition and other emergent state constructs in organizational settings would enhance our understanding of how these characteristics operate in real world teams.

Second, as mentioned earlier the relationships examined in this study precluded the assignment of causality, by virtue of the non-experimental nature of the research. Experimental examination of the relationships found in the study would be useful in addressing this issue.

Lastly, if the relationships found in the study receive additional support, examination of leadership behavior and team interventions that can leverage the relationships for the benefit of individuals, teams, and organizations would be worthwhile.

Appendix

Team Research Study Questionnaire

Directions

The researchers are the only persons that will see any individual survey responses. Please do not include your name or other identifying information on this questionnaire. All responses will be processed via a data code that does not allow responses to be traced back to an individual. If the team and/or organization has requested a summary of the results, these results will only be reported at the group level, and only if there are sufficient surveys to prevent identifying individuals.

The background information collected in the following several questions is gathered to aid in understanding the factors that contribute to team processes, dynamics and performance. It will not be used to identify any individual, but will only serve to allow analysis of group effects on the relationships of interest (e.g. difference in perceptions of newer vs. long term members of teams.)

Answering all of the questions is most beneficial to our efforts to study teams, however please feel free to skip any question if you would feel more comfortable doing so.

Background Information

Please circle the appropriate answer to question 1.

1. Length of time that you have been a member of the team:

- Less than a year
- 1 to 2 years
- 3 to 4
- 5 to 6
- Over 6 years

Please answer the following questions regarding your team on a five point scale where:
1= strongly disagree
2=disagree
3=neutral
4=agree
5=strongly agree

1. Each team member has specialized knowledge of some aspect _____
 of our work.

2. I have knowledge about an aspect of our work that no other team _____
 member has.

3. Different team members are responsible for expertise in different areas. _____

4. The specialized knowledge of several different team members is needed _____
 to complete our work.

5. I know which team members have expertise in specific areas. _____

6. I am comfortable accepting procedural suggestions from other team _____
 members.

7. I trust that other team members' knowledge about our work is credible. _____

8. I am confident relying on the information that other team members bring _____
 to the discussion.

9. When other members give information, I want to double-check it _____
 for myself.

10. Our team works together in a well coordinated fashion. _____

11. Our team has very few misunderstandings about what to do. _____

12. Our team needs to backtrack and start over a lot. _____

13. We accomplish tasks smoothly and efficiently. _____

14. There is much confusion about how we should accomplish our tasks. _____

Please answer the following questions in terms of the extent to which they occur in your team. Use a scale of 1 to 9 to answer the questions with:
1= None or Never
9= Always

15. How much personal friction is there among members of
 your team?   _____

16. How much are personal clashes evident in your team?   _____

17. How much tension is there among members of your team?   _____

18. How much emotional conflict is there among members of
 your team?   _____

19. How often do people in your team disagree about opinions regarding
 the work being done?   _____

20. How frequently are there conflicts about ideas in your team?   _____

21. How much conflict is there about the work you do in your team?   _____

22. To what extent are there differences of opinion in your team?   _____

Please answer the following questions regarding your team on a five point scale where:
1= strongly disagree
2=disagree
3=neutral
4=agree
5=strongly agree

23. I understand the goal(s) of our team.   _____

24. It does not take much to make me abandon our team goal(s).   _____

25. We are committed to pursuing the team's goal.   _____

26. We think it is important to reach the team's goal.   _____

27. We really care about achieving the team's goal.   _____

Please answer the following questions on a seven point scale where:
1= very false
2= false
3= slightly false
4= neither true or false
5= slightly agree
6= agree
7= strongly agree

28. I feel certain about how much authority I have.   _____

29. Clear planned goals and objectives exist for my job.   _____

30. I know that I have divided my time properly.   _____

31. I know what my responsibilities are.   _____

32. I know exactly what is expected of me.   _____

33. Explanations of what has to be done on my job are clear.   _____

34. I have a clear understanding of the roles of other team members.   _____

35. I understand the challenges faced by other team members in performing   _____
their roles.

36. I understand the contributions made by other members of the team.   _____

Please answer the following questions on a scale ranging from 1 to 9 with:
1= strongly disagree
9= strongly agree

37. We trust each other a lot in my team   _____.

38. I know I can count on the other team members.   _____

39. The other team members know they can count on me.   _____

40. I trust all of the other team members.   _____

41. How satisfied are you with being a member of this team?   _____
        1=very dissatisfied
        2= dissatisfied
        3=neutral
        4= satisfied
        5= very satisfied

Please answer the following questions regarding your team on a 5 point scale where:
1= strongly disagree
2=disagree
3=neutral
4=agree
5=strongly agree

42. This team is good at coming up with ways to complete their tasks.   _____

43. The team effectively deals with uncertainty and unexpected events.   _____

44. At times this team fails to approach its task adequately.   _____

45. This team consistently accomplishes its performance goals.   _____

46. Our ability to work effectively as a team is improving   _____

47. There is effective communication within the team.   _____

48. There is effective cooperation with other groups.   _____

49. Poor teamwork is not tolerated within our team.   _____

50. I get feedback about how well I am performing.   _____

51. I get feedback about well the team is performing.   _____

52. I get feedback on how my efforts are contributing to the team's
performance.   _____

Please use the following scale to answer questions 53 & 54.

1= Very little   2= Somewhat   3= Quite a bit   4= Very much

53. How much is your work affected by the way that your team members
perform their work?   _____

54. How much is your team members' work affected by the way you do
 your work?   _____

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Senior Research Manager   **Human Resources**

Managed employee opinion survey efforts, including strategy, administration, results interpretation, presentations to senior management, and follow-up. Facilitated unit discussions of work environment/productivity issues. Conducted workshops on Using Survey Results in Organizational Change for HR generalists serving as "on-site survey consultants". Consulted with management on organizational assessment and change efforts, & other HR/OD issues (e.g. performance management, personnel selection).

Prudential Insurance Company   **October 1990 to June 1993**
Senior Organizational Consultant   **Human Resources**

Served as an internal consultant on wide range of HR/OD issues. Developed and validated personnel selection and assessment procedures. Managed company-wide employee opinion survey projects. Served as principal representative to the Mayflower Survey Group (consortium of leading companies that use surveys). Played a key role in using the survey process to support Prudential's Managing Diversity program and subsequent external consulting efforts related to diversity. Also, facilitated diversity related focus groups of employee, middle manager, and executive staff.