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## ABSTRACT

Title of Document: INTERNAL TEAM LEADERSHIP:  
AN EXAMINATION OF LEADERSHIP  
ROLES, ROLE STRUCTURE, AND MEMBER  
OUTCOMES.

Jay Britton Carson, Ph.D., 2006

Directed By: Professor Paul E. Tesluk, Dept. of Management  
and Organization, Robert H. Smith School of  
Business, U. of Maryland

Effective leadership is widely considered a critical ingredient of team success, and some scholars have argued that abdication of leadership in any team is a recipe for failure (Sinclair, 1992; Zaccaro, Rittman, & Marks, 2001). However, much of the existing research on team leadership has focused exclusively on external leaders serving in a formal capacity in the organization (Kozlowski & Bell, 2002; Stewart & Manz, 1995), while largely ignoring the processes and impact of internal team leadership. This dissertation addresses this shortcoming in our understanding of team functioning and team leadership by studying internal team leadership roles, which are often informal and emergent.

I extended previous work on external team leadership roles in order to articulate a comprehensive yet parsimonious set of four team leadership roles – Navigator, Engineer, Social Integrator, and Liaison - that may be engaged in by

members of teams, not just formal leaders. I examined how time and team-level role differentiation serve as moderators of the relationship between these four leadership roles and individual contributions to the team. I also articulated three individual-level role-structuring processes – role overlap, role switching, and role sharing – and examined the benefits and challenges of these three individual processes across time by looking at their relationship with team member outcomes such as individual contributions, satisfaction with the team experience, and role stress – namely role conflict and role ambiguity (Jackson & Schuler, 1985; Tubre & Collins, 2000).

I tested hypotheses for this dissertation using data from 24 consulting teams in a multilevel longitudinal design. Data were collected primarily through surveys administered to team members at three points in time (beginning, middle, and end of projects). The primary statistical techniques were regression and hierarchical linear modeling. Findings showed support for the validity of the four leadership roles, as well as their ability to predict individual contributions to the team. The findings also demonstrated that both time and role differentiation are important moderators of this relationship, though not always in the hypothesized direction. Finally, there were important individual consequences for the role-structuring processes of role overlap and role switching.

INTERNAL TEAM LEADERSHIP:  
AN EXAMINATION OF LEADERSHIP ROLES, ROLE STRUCTURE, AND  
MEMBER OUTCOMES

By

Jay Britton Carson

Dissertation submitted to the Faculty of the Graduate School of the  
University of Maryland, College Park, in partial fulfillment  
of the requirements for the degree of  
Doctor of Philosophy  
2006

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Professor M. Susan Taylor  
Professor Ian O. Williamson

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## **Dedication**

This dissertation is dedicated to the loving memory of my mother, Clarene Carson, who first demonstrated to me that engaging in leadership requires neither a position nor a title. Without the constant encouragement that she, along with my Dad, gave me to “dream big dreams and follow them wherever God leads,” I would certainly never have completed a doctoral degree. Thank you for always believing in me Mom, and for teaching me to believe in myself and to trust God.

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## **Chapter 1: Introduction and Problem Statement**

Today's work environments are characterized by complexity and dynamism as a result of responses to high rates of technological change and increases in global competition (Lawler, Mohrman, & Benson, 2001). Employees are becoming more involved at all levels in an attempt to successfully navigate these changing business demands (e.g., Lawler, 1986). One method organizations have implemented to improve performance on highly complex, dynamic, and interdependent tasks is the use of teams (e.g., Salas, Burke, & Stagl, 2004; Zaccaro, Rittman, & Marks, 2001) which are able to distribute the workload, monitor team members' performance, and bring knowledge and collective expertise to bear on the task (Mathieu, Goodwin, Heffner, Salas, & Cannon-Bowers, 2000).

Teams are increasingly becoming a part of the organizational landscape, as they are being used with ever greater frequency to perform knowledge work and operate with high levels of autonomy (Cohen, Mohrman, & Mohrman, 1999; Mohrman, Cohen, & Mohrman, 1995). As of 1999, nearly 72 percent of the largest North American organizations had set up some form of self-managed teams, up from 28 percent in 1987 (Lawler et al., 2001). Teams have also been shown to have a positive relationship with organizational effectiveness. In their most recent study of Fortune 1000 firms, Lawler and colleagues (2001) found that greater use of team-related work practices predicted significantly higher returns on sales, assets, investment, and equity, as well as to investors.

Despite the importance of teams to organizational practice and the proliferation of research on various aspects of team effectiveness (Kozlowski & Bell, 2002), theory

surrounding leadership of and in work teams is sparse and tends to focus on individuals serving in a formal team leadership capacity (Kozlowski, Gully, Salas, & Cannon-Bowers, 1996; Pearce & Conger, 2003; Stewart & Manz, 1995; Zaccaro et al., 2001). Leadership is widely considered to be a crucial variable in understanding team effectiveness, even if there is not wide agreement over the exact nature of its role (Campion, Papper, & Medsker, 1996; Cohen & Bailey, 1997; Gladstein, 1984; Guzzo & Dickson, 1996; Hackman & Walton, 1986; Kozlowski et al., 1996; Sundstrom, DeMeuse, & Futrell, 1990). In fact, some researchers have argued that the most critical ingredient of team success is its leadership and that abdication of leadership in any team is a recipe for failure (Sinclair, 1992; Zaccaro et al., 2001).

Teams can have various leadership structures, which refer to the existence and position of those occupying leadership roles. It might be helpful to think about the leadership of teams as existing along two dimensions – formality and location. Formality refers to a continuum between one end where a formal leadership structure exists, consisting of individuals who hold the title, position, status, and authority of team leader through appointment or election, and the other end where leadership is exercised informally by team members without any formal authority vested in them. Location refers to whether leaders occupy a position that is external to the team or internal to the team. Thus, team leadership can be distinguished by whether it falls at the formal or informal end of the spectrum and whether it is external or internal. Table 1 presents a representative sampling (though not exhaustive) of key articles that have included various combinations of these two dimensions.



**Table 1**

**Team Leadership Dimensions: Key Citations**

	<b>External</b>	<b>Internal</b>
<b>Formal</b>	Graen & Cashman, 1975 Hackman & Walton, 1986 Manz & Sims, 1987 Stewart & Manz, 1995 Kozlowski et al., 1996 Tesluk & Mathieu, 1999 Zaccaro, Rittman, & Marks, 2001 Pearce & Sims, 2002 Druskat & Wheeler, 2003 Salas, Burke, & Stagl, 2004 Morgeson, 2005	Bales & Slater, 1955 Manz & Sims, 1987 Stewart & Manz, 1995 Durham, Knight, & Locke, 1997 Tesluk & Mathieu, 1999 Pearce & Sims, 2002
<b>Informal</b>		Taggar, Hackett, & Saha, 1999 Seers, 1989

As can be seen in Table 1, most existing theoretical and empirical work on team leadership has focused on formal external leadership (e.g., Druskat & Wheeler, 2003; Hackman & Walton, 1986; Kozlowski et al., 1996; Stewart & Manz, 1995). Hackman and Walton (1986) articulated a widely cited theoretical approach to team leadership that is functional, arguing that the role of the external team leader is to do whatever needs doing in order to ensure team success. They argue that external team leaders diagnose and act on internal team deficiencies, as well as forecasting and subverting any detrimental changes in external conditions.

This theoretical view has become very popular (e.g., Zaccaro & Marks, 1999; Zaccaro, Rittman, & Marks, 2001), but has a weakness in that it is often overly static in its assumptions about team composition, development, behavior, and performance. For example, Hackman and Walton describe five conditions for team effectiveness – a clear

and engaging direction, an enabling group structure that fosters competent task work, expert coaching and process assistance, a supportive organizational context, and adequate material resources. However, they do not specifically address how the external leader's role changes as the team develops, whether the team's task changes over time, how shifting membership impacts both the team and the external leader's role, and whether team performance criteria are static or dynamic.

A decade later, Kozlowski and colleagues (1996) contributed an important theoretical advancement by discussing how the external leader's role changes over time as the team grows and its developmental needs shift. They distinguished between the task and learning cycles of teams and described how the external leader moves along the learning cycle from acting as Mentor to Instructor to Coach and finally to Facilitator as the team develops expertise and becomes increasingly self-managing over a series of task performance cycles. It provided some improvement over the Hackman & Walton (1986) model by considering internal team dynamics and the need for shared affect, shared cognition, and compatible behavior by team members in order to increase levels of team coordination and adaptability.

There have been a number of more traditional studies of leadership such as transactional or transformational leadership that occur in a team context, and these generally treat the leader's influence as focused on the team as a whole (e.g., Bass, Avolio, Jung, & Berson, 2003). However, team members are treated as followers that collectively experience the leader's influence, and little consideration is given to leadership exercised by team members in these studies.

For instance, a more recent qualitative empirical study of external leaders of self-managing work teams found that external leaders perform a critical boundary-spanning function that changes over time (Druskat & Wheeler, 2003). By studying team leaders that were considered great and not just average, Druskat and Wheeler discovered that these leaders engaged sequentially in relating, scouting, and persuading behaviors aimed both within the team and at external stakeholders, and finally engaged in empowering behaviors aimed exclusively at the team.

Another recent study of external leaders of self-managing work teams found that leader intervention has differential effects on satisfaction with the leader and perceptions of leader effectiveness (Morgeson, 2005). These external leaders were not involved in the daily activities of the team, but specific actions such as helping the team prepare in advance and providing supportive coaching related positively to the team's perceptions of leader effectiveness. On the other hand, active forms of intervention by the external leader generally had negative effects on team satisfaction with the leader, but had positive effects on leader effectiveness during disruptive events.

However, these studies of team leadership have all focused clearly on the role of external leaders and have largely ignored the possibility or significance of internal leadership being exercised by team members. Of the studies of external team leadership, perhaps the one that has come closest to specifically incorporating internal leadership is the seminal empirical study of leadership of self-managing work teams by Manz and Sims (1987). These authors focused primarily on the role external leaders play in encouraging self-managing behaviors by team members. In their study, team member self-management could be considered a form of internal leadership since team members

exercised self-leadership. Teams also had a formal internal leader that was elected by the team who was responsible for coordination of group meetings, job assignments, and material resources; however, this member's role was not the central focus of the study. Thus, while internal leadership was present in this study in various forms, the actual leadership roles that different team members performed were not developed or explored.

While external leaders often are a critical element of team leadership, failure to understand the importance of internal team leadership is likely to leave a significant amount of variance in team performance unexplained. The proliferation of self-managing and other forms of autonomous work teams heightens the value of understanding internal team leadership processes as these teams do not always have a formally appointed external leader. Those that do are still likely to experience leadership being exercised by internal team members in addition to that of the external leader. Thus, there is a paucity of research that examines internal team leadership processes rather than simply examining an external team leader's influence on team members, either individually or collectively (Ilgen, Major, Hollenbeck, & Sego, 1993; Kozlowski & Bell, 2002; Stewart & Manz, 1995).

A fairly recent line of leadership research has begun to implicitly include internal team leadership processes in its inquiry. A number of scholars have begun to empirically study shared or distributed forms of leadership in teams (e.g., Pearce & Conger, 2003, Pearce & Sims, 2002). These studies generally consider leadership to be an influence process that any team member can choose to engage in. Rather than being concentrated in a single person vested with formal authority, these scholars consider the notion that leadership can emerge on an informal basis from within the team and can be shared or

distributed among many team members. Thus, while most of this work on shared leadership does not specifically mention the idea of internal leadership, its foundational assumptions are based on the idea that team members themselves can exhibit leadership.

The recent empirical examination of shared leadership has revealed fairly promising results for team performance. Avolio and colleagues (1996) explored shared leadership among teams of undergraduate students and found a positive correlation with self-reported effectiveness. Pearce and Sims (2002) studied the relationship between shared leadership and change management team effectiveness at a large automotive manufacturing firm and found shared leadership to be a more useful predictor than the vertical leadership of the appointed team leader. Sivasubramaniam and colleagues (2002) found that team leadership, defined in a manner similar to shared leadership as collective influence of members in a team on each other, was positively related to both team performance and potency over time in a sample of undergraduate business students. Carson and colleagues (2005) found that shared leadership was a strong predictor of team performance as rated by clients of consulting teams.

There is also some indirect support for shared leadership predicting team performance in the literature on emergent leadership. Taggar, Hackett, and Saha (1999) examined emergent leadership within teams and defined emergent leaders as group members who exert significant influence over other members although no formal authority has been vested in them. In addition to the emergent team leader (who had the most votes by fellow team members), they found that it was also important to have other team members demonstrate high levels of leadership influence in order for the team to achieve the highest levels of performance. Failure of even a single member to exhibit

leadership behavior was found to be detrimental to team performance. Although shared leadership was not formally defined or measured, these findings support the notion that shared leadership can result in greater effectiveness than the emergence of a single internal team leader.

Taken as a whole, these studies suggest that shared leadership is an important predictor of team performance, and provides an additional resource to teams beyond the leadership of any single individual. However, even among this recent work on shared leadership, there have been no studies to my knowledge that seek to take a more fine-grained approach to understanding the dynamics of leadership when it is internal to the team. There is no clear evidence regarding how leadership shifts from person to person across time within teams, nor what particular forms this leadership takes. Thus, there is a real need to address how different individual leadership styles and roles interrelate and complement one another when they are enacted informally by team members themselves.

In order to begin considering how teams are able to effectively handle internal leadership dynamics, an understanding of roles may be helpful. Role theory is a broad term applied to a set of interrelated theories seeking to describe the organization and meaning of behavior in social contexts. A role is defined as a dynamic set of recurring behaviors, both expected and enacted, within a particular group context (Zigurs & Kozar, 1994). Roles, therefore, serve two important functions by both establishing patterns for individual behavior through the interaction of members in a social unit (Katz & Kahn, 1978), and also establishing expectations for the behaviors of others.

Role theory has been previously applied to studies of leadership and teams. For example, role making processes have been combined with social exchange theory in

order to explain the importance of relationship quality between leaders and followers (Graen & Cashman, 1975) as well as among team members (Seers, 1989). Role theory has also recently been incorporated into work on team socialization in order to help explain the effectiveness of newcomers to teams (Chen & Klimoski, 2003), and has been considered an important multilevel linking mechanism between individual traits and team outcomes (Stewart, Fulmer, & Barrick, 2005).

Roles provide a valuable perspective for research on teams in that they both define the types of behavior that are expected from team members and offer a pattern for how team members can effectively participate in the team. Previous work on external team leadership has built on role concepts to give a more fine-grained understanding of how different functions or behaviors enacted by leaders comprise leadership (e.g. Kozlowski et al., 1996; Druskat & Wheeler, 2003; Graen & Cashman, 1975; Seers, 1989). The primary purpose of this dissertation is to extend this previous work on external leader roles by seeking to explore the question, “How might roles help us to better understand internal team leadership?”

In order to better understand internal leadership roles and dynamics, this study will focus exclusively on teams without a formal internal leader. This is important for several reasons. First, teams with a formal internal leader are likely to rely on that leader for specific leadership roles or functions as designated by the formal position or job description, which may place constraints on the ability or likelihood of other team members to exercise those leadership roles or functions. Second, previous research has shown that supervisors serve as key role senders and have influence over team member attitudes and behaviors as a result of positional resources and formal sanctions (Graen &

Cashman, 1975). Therefore, the presence of a formal internal leader will likely allow the leader to dictate the roles or functions of other team members to a greater degree which may result in role dynamics that are idiosyncratic to the formal internal leader's ideals or preferences. Third, with the rise of self-managing work teams many teams do not have a formally designated internal leader (Cohen, Chang, & Ledford, 1997), so this exclusive focus should add to the generalizability of the study.

Since there has been very little work on internal team leadership roles, there are three broad research questions that this dissertation seeks to answer. First, can I find empirical evidence that the set of four internal team leadership roles, which I derive from existing work on external team leadership, are distinct from one another and that they demonstrate added value to the team? Little is known about how informal leadership roles are distributed in teams. Thus, I begin by reviewing and integrating existing literature to articulate a comprehensive yet parsimonious set of four team leadership roles that should be present in order to ensure effective team performance. This represents an important step forward for team leadership theory because it provides a typology of the different ways in which leadership may be exercised on an informal basis within teams. This typology should be useful in improving our understanding of team development as well as shared leadership dynamics.

I also empirically examine this internal team leadership role typology and its operationalization. I first look at levels of agreement within teams regarding team member engagement in the four leadership roles in order to provide evidence that team members are able to consistently identify these roles. I also examine correlations among the four roles and perform confirmatory factor analyses in order to provide evidence that



they are empirically distinct and that team members can discriminate between them. Finally, I provide evidence that these roles are important to team members by testing their relationship with individual contributions to the team. Few researchers have examined the effects of roles on teams and their members (Levine & Moreland, 1990), and, as a result, little is known about how other team members perceive internal leadership roles and which ones are deemed important or beneficial.

The second research question examines whether two potential moderators – time and team level role differentiation – influence the relationship between these four leadership roles and individual contributions to the team. Since certain leadership roles may be more important at differing points in the team’s development and task performance cycle (Kozlowski et al., 1996), I test the importance of these roles at the beginning, middle, and end of the team lifecycle. There has been very little empirical work on the changing value of leadership roles over time, and no work to my knowledge that examines the benefits of role enactment that accrue to individual team members. Hollander has noted, “Leadership research has generally dealt more with its static than its dynamic features.... Certainly it is difficult enough to disentangle the many factors that ordinarily are treated as dependent and independent variables in leadership, but we need to give more consideration to the time differential.” (Hollander, 1985: 527) An improved understanding of how leadership roles relate to individual contributions over time provides important knowledge about how and when enactment of these leadership roles results in an enhanced perception as an informal leader within the team.

The second potential moderator that I consider is role differentiation. The structure and division of roles at the team level should affect the relationships between

individual engagement in team leadership roles and the level of individual contributions perceived by the team. Currently, little is known about team level factors that influence the emergence, adoption, and clarity of roles within teams, so this dissertation provides crucial information about how team structures can potentially impact the perceptions of role contributions by its members.

The third broad research question this dissertation seeks to answer is what are some of the positive and negative effects for individual team members of both within-member and between-member leadership role-structuring processes? As team members seek to engage in leadership, their enactment of these roles may become complex. For example, individual team members may engage in more than one leadership role at the same time, a process referred to in this dissertation as role overlap. Team members may also find that as the team moves further along towards task completion and continues to develop as a unit that they need to switch from one leadership role to another, a process referred to in this dissertation as role switching. In addition to these within-member role-structuring processes, individuals may discover that more than one team member is engaging in a particular leadership role at the same time, a process referred to in this dissertation as role sharing.

I examine the potential benefits and challenges of these three individual role-structuring processes across time by looking at their relationship with team member outcomes such as individual contributions, satisfaction with the team experience, and role stress (conflict and ambiguity). Engaging in leadership is likely to bring with it the benefits of an enhanced perception as a strong contributor to the team. It is possible that

the additional effort and demands of taking on multiple roles may result in an even stronger positive perception within the team.

However, based on previous work in role theory, it can be difficult for people to manage the expectations of multiple roles at the same time (e.g., Kahn, Wolfe, Quinn, Snoek, & Rosenthal, 1964). It can also be difficult to manage a lack of clear role expectations due to role ambiguity (e.g., Rizzo, House, & Lirtzman, 1970). These can both lead to role stress and have a detrimental impact on individual performance (e.g., Tubre & Collins, 2000). Thus, an examination of how the processes of role overlap, role switching, and role sharing relate to individual outcomes such as role conflict, role ambiguity, and satisfaction with the team experience over time will provide additional knowledge about potential adverse consequences or challenges related to engagement in informal leadership roles for individuals in team settings. An understanding of these potential negative consequences is important because they can potentially lead to burnout or avoidance of role responsibilities.

#### *Contributions of better understanding of internal team leadership roles*

In summary, leadership in teams serves as a lever that can either spark the team towards greater levels of success or hinder the ability of the team to accomplish its purpose and goals (Gladstein, 1984; Guzzo & Dickson, 1996; Hackman & Walton, 1986; LaFasto & Larson, 2001; LePine, Hollenbeck, Ilgen, & Hedlund, 1997; Taggar, Hackett, & Saha, 1999). This study is attempting to break new ground by articulating the types of leadership roles that individual team members might engage in, to empirically examine the existence of these roles, and to consider potential outcomes for individuals that engage in these roles.

This dissertation provides a number of important contributions to our understanding of internal leadership in teams by building on concepts from role theory and extending existing work on organizational role dynamics to a team setting. First, it provides a theoretically meaningful and empirically measurable typology of team leadership roles that goes beyond the broad task and socio-emotional roles found by Bales (Bales, 1950; Bales & Slater, 1955). Second, it enhances our understanding of how engagement in leadership roles relates to attributions of individual contribution at different phases of the team's life cycle. Third, it enhances our understanding of how the structure and division of roles at the team level plays a role in reducing or increasing the perceived value of informal leadership roles by team members. Fourth, it offers greater knowledge about the benefits and drawbacks of both within-member and between-member role-structuring processes such as the adoption of multiple roles, switching roles over time, and sharing roles with other team members.

## **Chapter 2: Theoretical Background and Literature Review**

In order to establish a theoretical foundation for the arguments in this dissertation, it will be helpful to review the four primary literature streams that I draw upon. To that end, this chapter will focus on reviewing and integrating literature in the area of general role theory, work that has been done on roles in teams, existing theoretical conceptualizations of team leadership roles, and the long-standing research on organizational roles and role stress.

Role theory serves as the general background for this study and will be used to establish an understanding of how roles are important both in providing patterns for behavior of focal individuals and in establishing expectations of alters or others in the team. I will then examine three approaches that have been used in previous research to examine roles in teams. Next, I review and integrate a number of existing theoretical conceptualizations of team leadership roles in order to provide a comprehensive yet parsimonious set of four team leadership roles that are necessary for team effectiveness. Finally, I review the rich body of work on organizational roles and role stress and examine how this work relates to understanding leadership roles in teams.

### *Role theory*

Rather than existing as a single theory, role theory is actually a term used to describe a set of related theories that all seek to explain how social behavior is organized and given meaning for individuals and groups in terms of roles (Turner, 2002). A *role* is defined as a dynamic set of recurring behaviors, both expected and enacted, within a particular group context (Zigurs & Kozar, 1994). The basic premise of role theory is that actions and sentiments tend to be differentiated into roles (Turner, 2002).

There are two versions or types of role theory according to Turner (2002): *structural* theories and *interactional* theories. Structural role theories describe the sets of expectations placed upon individuals based upon their status in a given social structure. Individuals are thought to possess a role set which helps describe the expectations (explicit or implicit) placed upon them depending on who the other persons (alters) are in a particular interaction. Thus, structural role theories assume that roles begin with status or position in social situations and that the expectations concomitant with the role are subsequently imposed upon the individual. Interactional role theories, on the other hand, assume that roles represent a patterning of behavior that emerges from dynamic interactions in a social context (Turner, 2002). Status and position in this view are simply a formalizing byproduct of this role-making interaction that serve to provide an organizing function in the social context.

Structural and interactional role theories each provide important lenses for understanding the nature of roles in team settings. Structural role theories offer a “top-down” role-making effect that explains how roles create expectations for how an individual should behave. Role expectations serve as ambient stimuli (see Hackman, 1992) that individuals attend to in seeking to behave in ways that are acceptable to relevant others. In teams, this effect is most likely to be seen when roles are formally assigned or agreed upon in some way. If each member of the team has a designated role (for example - the facilitator, time-keeper, subject-matter expert, devil’s advocate, or researcher) then the group will place expectations on each individual to behave in ways that are consistent with their role. This effect might also occur if people bring certain well-known and collectively understood roles to the team as part of their identity. For

example, if a team member is widely regarded as a subject-matter expert then the team will likely place expectations on that person to weigh in strongly on issues related to their expertise. Another example would be when a team member brings a formal organizational role to the team, such as Chief Legal Counsel, they are likely to have expectations placed on them based on their identity (in this case, a lawyer.) Thus, structural role theories can be used to describe how an entire team will collectively place “top-down” expectations on individual team members based on formal or informal roles.

Structural role theories serve as an important background to the existing understanding of formal external team leadership. When someone is formally given the role of “team leader,” whether by an organization or by the team members themselves, there is a resulting set of expectations placed upon that person and their behavior. Perhaps more importantly for this dissertation, the rest of the team is simultaneously cast in the role of alters, or others lacking the role, status, and expectations of a team leader. Since organizations often designate formal leaders for teams, it is not surprising that we find the distribution of team leadership studies in Table 1 to clearly favor formal external leadership.

Interactional role theories, on the other hand, offer a complementary “bottom-up” role-making effect that explains how roles provide a pattern for individual behavior that emerges from social interaction. In teams, this effect is most likely to be seen when roles are not formally assigned but instead emerge naturally over time. As team members interact and adapt in order to coordinate their efforts at goal attainment, members are likely to begin following certain behavioral patterns as they discover the most effective and efficient ways to work together. These emergent roles may or may not become

formalized by the team, but either way they serve an important function by providing a pattern or template which individuals can follow in order to help the team improve its operation and performance. This is consistent with Kozlowski and Klein's (2000) discussion of compilation forms of emergence, which result from the bottom-up effects of interaction processes among diverse elements of a social unit. The hallmark of these compilation forms of emergence is variability and configuration (Kozlowski & Klein, 2000). Thus, interactional role theory provides the primary perspective for this dissertation by helping to explain the informal emergence of role structures and resulting patterns for behavior through a team's interaction over time.

According to Turner (2002), there are a few basic assumptions in interactional role theory that are important to consider. First, people are involved in role-making processes when they interact socially and tend to behave as if there are roles. These roles are thought of more as broad goals than as specific behaviors. Thus, while roles may be clarified or understood by thinking of typical role behaviors, it is the broad goal of the role that is key to the role rather than enactment of certain specific behaviors. This will become very important for the operationalization of the team leadership roles developed in this study. Second, people tend to creatively enact their own roles in such a way as to interact effectively with relevant others (alters). Third, roles tend to exist in pairs or sets and are linked together through role relationships. This requires some familiarity with or generalized role conception of the alter(s). Thus, an understanding of what one's own leadership role is on the team is associated with what one's leadership role is not. Fourth, while role making is prevalent, there is also a tendency for roles to become somewhat normative over time in order to enhance predictability in social situations.



Turner has also suggested three principles that serve as the basis for *role differentiation*. The functional principle argues that roles are differentiated by either: (1) association of skills, knowledge, or dispositions; (2) diversity of actual or potential incumbent characteristics; or (3) minimizing the incompatibility of goals and means. Thus, differentiation of leadership roles within a team may occur on the basis of the team's composition and its understanding about how to best achieve certain group and/or interpersonal goals (which may be explicit or implicit). The representational principle argues that roles are differentiated by consistency with the image that roles represent. Thus, differentiation of leadership roles in teams may also occur on the basis of the team's implicit leadership theories (Lord & Maher, 1991). The tenability principle argues that roles are constructed and differentiated by assessments of the benefits and costs associated with enacting a given role in comparison with viable alternatives. This principle is also important to consider in this dissertation because it may help explain individual choices to engage in or withdraw from team leadership roles based on the potential benefits and costs for each individual. In other words, engagement in a particular team leadership role may be partially determined by who has the most to gain or the least to lose from that particular role.

Thus, interactional role theory serves as an important background for understanding the nature of leadership roles in teams, since these roles are most likely to be informal and emergent. There are four types of broad roles according to interactional role theory – basic roles (such as gender, age, and social class), position or status roles (such as occupational or family roles), value roles (such as hero, saint, or villain), and functional group roles. Functional group roles are defined as “the unformalized behavior

patterns that emerge spontaneously as individuals acquire situational identities during sustained interaction in a group setting.” (Turner, 2002: 234) Thus, functional group roles can be used to describe the patterning of individual behaviors in teams based on their situational identity in the team environment. This is an important concept for this dissertation because there is a strong link between the salience of one’s situational identity and the level of engagement in a particular leadership role. When one’s identity has not been clearly formed regarding leadership of the team, there is not a clear pattern for appropriate types of behavior, which can lead to a reduced perception of one’s contribution to the team by teammates as well as increased personal stress.

#### *Previous work on roles in teams – Three approaches*

There have been three basic approaches to examining roles in team settings in previous research. The first approach considers roles that emerge or may potentially emerge within teams. These types of studies examine teamwork roles or task roles that contribute to a distribution of labor and efficient task performance by the team as a whole. There have been several articles and books prescribing ostensibly “complete” sets of formal roles within teams that, if balanced within the team, will lead to high performance levels (e.g., Belbin, 1993; Partington & Harris, 1999; Senior, 1997). Other studies have attempted to predict emergent roles in self-organizing groups (e.g., Stempfle, Hubner, & Badke-Schaub, 2001). While somewhat intuitively appealing, there has been mixed support at best for these team role balance theories, and as a result they have failed to gain momentum in the field.

It is important to note that these role sets comprise effective teamwork rather than effective leadership within the team. Katz & Kahn (1978: 302) describe leadership as the

influential increment over and above mechanical compliance with routine directives, while Marks, Mathieu, and Zaccaro (2001: 356) describe teamwork as people working together through effective processes to achieve something beyond the capabilities of individuals working alone. Thus, these role balance theories are primarily concerned with efficient and effective distribution of effort (teamwork) rather than incremental influence (leadership) provided by various team members. One or more of these teamwork roles are sometimes related to leadership, but in these studies team roles serve as either a substitute for team leadership (Kerr & Jermier, 1978) or an outcome of effective team design. Formal role performance here is primarily the sign of an effective, functioning team member rather than an indication of leadership (except in the cases where they are serving in a leader or director role.) Thus, in these studies there is typically a failure to distinguish between leadership roles and teamwork roles by clearly defining the nature of team leadership.

The second approach to roles in teams is a dichotomous approach that considers the formal roles of team leader versus team member. Formal leadership roles refer to situations where an individual has either been appointed or elected as leader of a team. These studies draw on social exchange theory (e.g., Homans, 1961) and organizational role theory (Katz & Kahn, 1978) and help to understand how the quality of interpersonal relationships between formal external leaders and team members affects team member responses to that leadership (LMX theory – Graen & Cashman, 1975). These studies have found that followers tend to form in-groups and out-groups with the leader on the basis of the quality of their exchange relationship. However, these studies consider leadership to be a uni-dimensional role enacted by a single individual. According to

Hollander, “The leader role is not of one piece but rather is multifaceted and variegated. ...More attention is needed to the *wider range of behaviors the leader role represents* and the meanings these have for leaders and followers in context.” (Hollander, 1985: 527, emphasis added)

The third approach to roles in teams seeks to actually consider different ways in which individuals may exercise leadership within teams. This may happen on a formal basis – as in the case of emergent leadership studies where the leader is identified through formal election or nomination by team members – or on an informal basis. There is general agreement among scholars that leadership involves a complex of roles (e.g., Hollander, 1985), and a number of scholars have offered theoretical typologies of the various roles or functions that leadership must provide within team settings (See Table 2). While there has been no convergence on a single typology as better than others, there is a surprising degree of overlap in the basic ideas suggested by most of these scholars. This approach is the focus of this dissertation, and surprisingly little empirical work has been done in this area.

Some of the earliest empirical work points towards dual task and relational leadership roles in teams. Bales (1950) and Bales and Slater (1955) studied emergent leadership in leaderless teams and found that two leaders consistently emerged: the first or most influential was highly task-oriented (instrumental behaviors focused on assisting the team in achieving its goals) while the second most influential was focused on the socio-emotional needs of the team (reinforcing and guiding group behavior, inter-member relations, and group solidarity.) Hollander’s (1961) review of research on emergent leadership also concluded that both task-focused (task competence and skill in

coordination of team task goals) and relational behaviors (skill in building trust) were important for individuals to be selected as leaders. Recent research has also supported both task coordination behaviors and member support and development behaviors as being important for emergent leadership in teams, with task behaviors being slightly more important (Kellett, Humphrey, & Sleeth, 2002; Taggar et al., 1999).

While these two-dimensional models represent useful ways of thinking about leadership, they are fairly broad and team leadership is fairly complex. Therefore, it is important to conceive team leadership roles that are of theoretical importance to team effectiveness. By focusing on team leadership roles, organizations may be able to discern the key leadership roles that are important for different types of teams, to better diagnose the nature of internal leadership problems when teams are not performing well, and to improve their ability to select and develop effective team leaders.

#### *Four team leadership roles*

In order to establish a useful typology of team leadership roles, it is important that these roles be comprehensive enough to cover a broad swathe of team leadership, distinct enough to establish discriminant validity between each role construct, and parsimonious enough to be useful for scholarship and practice. After reviewing the existing theoretical conceptualizations of team leadership roles or functions, I have observed that there is a large degree of convergence around four distinct roles that are important for team leadership and that fit these three criteria (See Table 2). Although the relative emphasis on each role might be different, each of these roles is likely to be very important for team effectiveness regardless of the type of team under consideration (Sundstrom et al., 1990). I have given these four roles the following names to capture the nature of the behaviors

and functions for members enacting each one: Navigator, Engineer, Social Integrator, and Liaison. I will begin by reviewing the extant work on which these roles are based, and will conclude this section by integrating this work into a description of each of the four roles.

**Table 2**  
**Integrated Taxonomy of Internal Team Leadership Roles**

	<b>Navigator</b>	<b>Engineer</b>	<b>Social Integrator</b>	<b>Liaison</b>
<b>Key Questions</b>	<i>Why? Where?</i>	<i>Who? When?</i>	<i>How?</i>	<i>Who? What?</i>
<b>Hackman &amp; Walton, 1986</b>	Clear, engaging direction	Group structure	Effective coaching and process assistance	Context support; Adequate material resources
<b>Barry, 1991</b>	Envisioning	Organizing	Social Integrating	External Spanning
<b>Zacarro &amp; Marks, 1999</b>	Direction-Setter	Operational Coordinator		Liaison
<b>Hollander, 1985</b>	Communicator; Problem Solver/Planner	Director of Activity	Adjudicator of Conflict	Advocate; Liaison
<b>Gibb, 1954</b>	Initiator; Energizer	Expediter	Harmonizer	

One of the earliest scholars to discuss the possibility of leadership being separated into roles that might be distributed among team members was Gibb (1954). Gibb suggested that there are two forms of team leadership: distributed and focused (Gibb, 1954). Focused leadership occurs when leadership resides within a single individual, whereas distributed leadership occurs when two or more individuals share the roles, responsibilities, functions, and tasks of leadership. Gibb argued that there were four key leadership roles that might be distributed or shared among team members: Initiator,

Energizer, Expediter, and Harmonizer. The roles are fairly self-explanatory by their names. The Initiator is responsible for helping the team to establish and move towards its goal or purpose, while the Energizer is responsible for keeping the team motivated and energized in its efforts at achieving its goals and purpose. The Expediter ensures that task efforts are well coordinated, efficient, and effective, while the Harmonizer is responsible for making sure that social interactions among team members are smooth and cohesive and that conflict is dealt with in a productive manner.

Hollander (1985) described a more extensive set of six leadership roles in his theoretical arguments regarding team leadership. His typology of team leadership roles included the following: Communicator, Problem Solver/Planner, Director of Activity, Adjudicator of Conflict, Advocate, and Liaison. Again, these roles are fairly self-explanatory according to their titles. However, there is a good bit of conceptual overlap between several of the roles. For example, the Communicator role is likely to overlap with several of the other roles, since leadership influence of any kind is often exercised through verbal expression. Also, the Advocate and Liaison roles are likely to have significant overlap in that both of these are forms of boundary-spanning behavior (Ancona, 1990; Ancona & Caldwell, 1992; Gladstein, 1984).

One of the more prominent perspectives on team leadership is the functional approach, which views leadership as those functions performed by external leaders which assist a team in performing to its utmost effectiveness (Hackman & Walton, 1986). The key assertion of the functional approach is that a leader's job is to do, or arrange to get done, whatever is needed for the group to function well and achieve its potential (Hackman & Walton, 1986; Zaccaro & Marks, 1999). Thus, a team leader is effective

when and if the team is able to meet its goals and accomplish its purpose. Building on McGrath's work, Hackman and Walton (1986) argue that the type of activity – monitoring and taking action – and the orientation of the activity – internal or external to the group – can describe these functions. Thus, team leaders diagnose and act on internal team deficiencies, as well as forecast and subvert any detrimental changes in external conditions.

Hackman and Walton (1986) proceed to describe five conditions that they believe are the key to team effectiveness in organizations. Teams must first possess a clear, engaging direction that will enable them to remain focused and energized. Second, they must have a group structure that fosters competent task work, enabling an efficient flow of work that optimizes individual contributions. Third, teams must have access to expert coaching and process assistance in the areas of effort (coordination, motivation, and commitment to the task), knowledge and skill (sharing and effectively utilizing member expertise), and effective task performance strategies. Fourth, teams must be a part of an organizational context that supports and reinforces excellence through its reward, educational, and information systems. Fifth, teams must have adequate material resources, including money, space, supplies, tools, and support personnel that are needed to complete the task.

Zaccaro and Marks (1999) have provided a typology of team leader roles that is also based in the functional perspective. Leadership is described as social problem-solving, which is quite similar to the monitoring and taking action behaviors described by McGrath. These authors argue that team leaders must perform three important roles - providing the strategic and operational direction for team action, facilitating internal team



operations in pursuit of this direction, and linking the team to its external stakeholders and environment. These roles are given the names Team Direction-Setter, Team Operational Coordinator, and Team Liaison, respectively. While the approach to performing these roles can vary across persons and situations, the roles themselves are thought to be universally important for team leaders to enact.

Barry (1991) recognized some of the limitations in previous individual-oriented leadership models and sought to develop a model of leadership suitable for self-managing teams. Barry defines leadership as a “collection of roles and behaviors that can be split apart, shared, rotated, and used sequentially or concomitantly,” and suggests that a distributed leadership pattern in a self-managing teams is necessarily emergent in nature (Barry, 1991: 34). He used a qualitative, grounded theory approach to study 15 self-managed teams and developed the distributed leadership model, which defines four types of leadership roles that are necessary for effective performance in self-managing teams. Envisioning leadership centers around the creation of new and compelling visions or creative ideas, Organizing leadership channels and implements these ideas, Spanning leadership insures that the ideas fit with those of other stakeholders outside the team, and Social leadership focuses on development and maintenance of the team by providing the interpersonal glue necessary to keep the team together. The distributed leadership model is proposed to apply to project teams, problem solving teams, and policy making teams, and suggests that the four different types of leadership are differentially emphasized and needed during various team life cycle phases for each of these types of teams. Thus, “at any one time multiple leaders can exist in a team, with each leader assuming a complementary leadership role.” (Barry, 1991: 34)

Building on and integrating this body of existing work on team leadership roles, I have developed a taxonomy of four internal team leadership roles (see Table 2). The first team leadership role is the Navigator, which is responsible for helping to establish the team's purpose and direction. The Navigator helps to figure out where the team is headed and keeps it focused on that direction as it proceeds with its work. The Navigator role addresses the questions, "*Why* do we exist?" and, "*Where* should we be going?" The second team leader role is the Engineer, which is responsible for structuring the team and the task in the most efficient and effective ways to facilitate the achievement of the team's purpose and goals. The Engineer role addresses the questions, "*Who* should do what on the team?" and, "*When* should each member do their job?" The third team leader role is the Social Integrator, which is responsible for maintenance of healthy and productive social interactions and relational processes within the team. The Social Integrator helps the team with socialization and team development, and assists in resolving conflict when it arises. The Social Integrator role addresses the question, "*How* should the team interact in doing its work?" The fourth and final team leader role is the Liaison, which is responsible for developing and maintaining relationships with external stakeholders. The Liaison serves as both an advocate and ambassador for the team, and solicits needed resources from the external context. The Liaison role addresses the questions, "*Who* needs to be aware of our work?" and, "*What* does the team need from its environment?" In the following, I will describe each role in more detail and demonstrate how it relates to and integrates existing treatments of team leadership roles.

*Navigator.* A primary team leadership role is to provide a clear and engaging direction for team action. In this Navigator role, team leaders must establish and

communicate the team's overall purpose, as well as develop more specific operational or task goals in order to achieve this purpose. These goals should be specific, difficult, measurable, attainable, and flexible as the environment changes (Locke & Latham, 1990, 2002; Zaccaro & Marks, 1999). Thus, the Navigator must re-focus the team's direction and goals as needed in order to continue to fulfill its purpose. Goal alignment is very important in this role. The leader must ensure that the team's goals are aligned vertically with organizational goals and stakeholder expectations, and that team goals are aligned horizontally with other groups working toward the same strategic purpose (Marks et al., 2001; Zaccaro & Marks, 1999).

The role of Navigator is related primarily to Hackman and Walton's (1986) first condition for team effectiveness - a clear, engaging direction, and Zaccaro and Marks' (1999) Direction-Setter role. Effective performance in this role will give rise to teams that are focused on their purpose and energized towards achieving their goals as a result of the clarity and sense of meaning provided by the leader's direction (Zaccaro & Marks, 1999). Effective direction-setting will also lead to greater persistence and adaptability of task strategies when environmental conditions change (Locke & Latham, 1990), as well as better coordination with the actions of other groups. The Navigator role is also closely aligned with Barry's (1991) Envisioning leadership role which calls for providing new and compelling visions for the team's direction and purpose. The Navigator is similar to Gibb's (1954) roles of Initiator and Energizer since this role is responsible for initiating the team's purpose and direction, which should be clear and energizing. Finally, the Navigator should be a good Communicator and Problem Solver/Planner (Hollander,

1985) in order to anticipate hurdles or roadblocks and effectively keep the team aligned with its mission and purpose within the organization.

*Engineer.* Team leadership also requires managing the internal task and workflow dynamics of the team. In the Engineer role, team leaders must establish, facilitate, monitor, and adjust the individual and collective actions of the team (Zaccaro & Marks, 1999). The team must be structured and tasks assigned in a way that optimizes the strengths and minimizes the weaknesses of members' individual contributions to the team's task and purpose. Workflow and team member interaction patterns should be efficient and team members should be clear about their role in the process. Engineers must monitor and adjust the structure, task assignments, and workflow as needed due to changes in the team's environment, and continue to train and develop the team members in their various roles and tasks (Kozlowski et al., 1996).

The role of Engineer is related to Hackman and Walton's (1986) second condition for team effectiveness - a group structure that fosters competent task work. Effective performance in the Engineer role will result in a team that has the right people in the right place at the right time doing the right thing. It represents the taskwork component of Zaccaro & Marks' (1999) Operational Coordinator role (with the other component being more social or relational – see below.) The Engineer role is closely aligned with both Barry's (1991) Organizing leadership role and Hollander's (1985) Director of Activity since both have to do with effective and efficient implementation of the team's direction. Finally, the Engineer role is highly similar to Gibb's (1954) Expediter role, which is concerned with effective coordination of the team's efforts.

*Social Integrator.* Team leadership should develop not only efficient task work but also effective and cooperative teamwork, which involves a social or relational component. In the Social Integrator role, team leaders must ensure that members communicate and collaborate with one another in a manner that leads to synergy rather than process loss (Hackman, 1987). It is important for the team to develop a positive and productive psychological climate for its members to work in, including factors such as collective efficacy (the team's belief that it can succeed in the face of most challenges it faces - Bandura, 1986; Lindsley, Brass, & Thomas, 1995), shared mental models (agreement about expected team and member actions - Klimoski & Mohammed, 1994), knowledge sharing, psychological safety (the belief that the team is a safe place for interpersonal risk-taking - Edmondson, 1999), and healthy group norms that support a positive environment.

The role of Social Integrator is related to Hackman and Walton's (1986) third condition for team effectiveness - expert coaching and process assistance. Effective performance in the Social Integrator role will result in teams that are cohesive and able to effectively regulate their behavior through the right group norms. It represents the social or relational component of Zaccaro & Marks' (1999) Operational Coordinator role, which means helping the team to interact with one another in ways that lead to greater collective effort, skill development and knowledge sharing, and process synergies. The Social Integrator role requires effective facilitation of conflict that arises within the team, and thus is highly related to Hollander's (1985) Adjudicator of Conflict role. This role is virtually identical to the Social Integrator role found by Barry (1991), as well as the Harmonizer role suggested by Gibb (1954).

*Liaison.* One of the most important team leader responsibilities is effective management of the team's external linkages (Ancona & Caldwell, 1992; Druskat & Wheeler, 2003). In this Liaison role, team leaders must attend to the team's environment and develop and maintain relationships with important contacts and stakeholders outside the team (Zaccaro & Marks, 1999). This involves interpreting, influencing, and translating the demands of supervisors and executives as well as the needs of end users of the team's output to the team. It also involves representing the team to stakeholders in a way that safeguards the interests of the team, manages expectations, and maximizes the support available to the team. In order to succeed, team leaders should build networks with potential sources of information and resources within the organization (and sometimes outside the organization as well), as well as with key constituencies.

The role of Liaison is related to Hackman and Walton's (1986) fourth and fifth conditions for team effectiveness - an organizational context that supports and reinforces excellence, and adequate material resources. By building and maintaining effective networks with individuals responsible for rewards, education, information, and material resources, team leaders ensure that their team has the necessary assets and assistance to accomplish its purpose and enable success. Zaccaro and Marks (1999) include coordinating material resources as a part of the Operational Coordinator role, but I see this is as more strongly associated with the Liaison role. The primary concern is acquiring resources that the team needs to accomplish its purpose, which is dependent on the quality of its external linkages. If the team has free access to all necessary resources then allocation of the resources may fit the coordinator role, but resources are typically scarce and therefore require an effective liaison.

The importance of these four team leader roles can also be found implicitly in empirical work conducted by other researchers on team leadership. For example, LaFasto and Larson (2001) found six competencies that were useful for team leaders in a study of more than 600 team leaders in different settings. Two of these are related to the Navigator role (focus on the goal and set priorities) two are related to the Engineer role (demonstrate sufficient technical know-how and manage performance) and two are related to the Social Integrator role (ensure a collaborative climate, build confidence). Druskat and Wheeler (2003) examined the nature of leadership in self-managing teams and found that the best leaders were those that engaged in boundary-spanning behaviors, focusing alternately on internal and external issues relative to the team. Boundary-spanning behaviors are related to the Liaison role, and their importance to team effectiveness has been validated in work by Deborah Ancona (Ancona, 1990; Ancona & Caldwell, 1992; Gladstein, 1984).

I have argued that all four of these internal team leadership roles are important, but have not yet considered any of the potential difficulties associated with the process of engaging in team leadership roles over time. While all four leadership roles have been associated with effectiveness for the team, there is a rich body of literature on organizational role stress that suggests that ambiguity, conflict, and overload associated with roles can have detrimental effects on individuals. I will turn now to a brief review of this important research on roles and its applicability to teams.

#### *Organizational role stress*

The literature on organizational role dynamics provides a useful background for this work as well since it focuses primarily on how the two key constructs of role

ambiguity and role conflict impact individual outcomes, particularly stress, commitment, and satisfaction. These constructs have been the subject of numerous organizational studies dating back to the 1950s and 60s (e.g., Kahn et al., 1964; Neiman & Hughes, 1951) and have been the focus of four meta-analyses (Abramis, 1994; Fisher & Gittelsohn, 1983; Jackson & Schuler, 1985; Tubre & Collins, 2000). The general conclusion of these studies has been that uncertainty about roles can have a detrimental impact on individual cognitive states such as commitment and satisfaction, and sometimes results in poor performance as well.

I have defined roles in this dissertation as a dynamic set of recurring behaviors, both expected and enacted, within a particular group context (Zigurs & Kozar, 1994). According to organizational role theory, role-making processes in organizations are generally understood to be a dyadic phenomenon between role senders and role receivers that occurs as a result of expectations that are communicated by role senders and patterns of behavior that are enacted in response to those expectations by role receivers (Graen & Cashman, 1975; Seers, 1989). Role senders are typically supervisors or managers, and role receivers are typically the focal individuals in the study.

The primary mechanisms by which roles influence job behaviors and performance are communications by role senders of expectations and standards, both explicit and implicit, and knowledge, information, and understanding of effective job behaviors by focal individuals (Katz & Kahn, 1978; Tubre & Collins, 2000). Jackson and Schuler (1985) have pointed out that in addition to these cognitive mechanisms, expectancy theory (Vroom, 1964) would suggest that job performance is likely to be negatively



related to role ambiguity and conflict as a result of lower motivation due to weaker effort-to-performance and performance-to-reward expectancies.

Role ambiguity refers to expectations surrounding a role, and occurs when the set of behaviors expected for a role is unclear (Katz & Kahn, 1978). If communication regarding a role is unclear or nonexistent, then it is likely the focal individual will experience role ambiguity. Similarly, if focal individuals lack knowledge, information, or understanding about behaviors that are appropriate, whether or not there has been communication by role senders, they are likely to experience role ambiguity. According to Tubre and Collins, “In today’s complex work environments... blurred roles are especially likely to occur in jobs where the responsibility and performance of job tasks is distributed among teams and team members.” (Tubre & Collins, 2000: 157) Jackson and Schuler (1985) suggested that higher levels of employee interdependence, a defining characteristic of work teams (Kozlowski & Bell, 2003; Sundstrom et al., 1990), is more likely to lead to role ambiguity than when employees are in jobs characterized by specific individual tasks with low levels of interdependence.

Role conflict involves the compatibility of demands facing an individual (Ilgen & Hollenbeck, 1991). It occurs when there is incompatibility between the expected set of behaviors perceived by the focal person and those perceived by role senders. If communication regarding a role is inconsistent, then it is likely that the focal individual will experience role conflict. Similarly, if focal individuals are overwhelmed by the amount of information about appropriate behaviors that they are receiving from role senders, they are likely to experience role conflict. Jackson & Schuler (1985) suggested

that role conflict may be greater in more complex jobs where roles are less clearly defined and communicated, usually by managers.

Although this line of research has focused on individual roles in organizations, the basic understanding of organizations as open role-systems that depend on member interaction within an environment can be applied to teams as well (Katz & Kahn, 1978). However, it is important to note that the literature on organizational role stress does not provide an adequate foundation on which to truly build a theory of internal team leadership roles. First, organizational role theory is primarily rooted in structural role theories rather than interactional role theories. It assumes the existence of a formal role for the focal individual. Second, as a result of this focus the unit of analysis is mainly the job. Much of this work has to do with stress or overload in a particular job or job type, and this job is assumed to be synonymous with one's role in the organization. As previously discussed in this chapter, the focus of this dissertation is based more on the assumptions of interactional role theories than those of structural role theories.

Therefore, the purpose of reviewing this literature on organizational role stress is to provide a background and basic understanding of how individual role perceptions tend to affect cognition and performance, and to consider how these findings might enhance our understanding of team role dynamics. The key mechanisms described in literature on organizational role stress – signals regarding expectations and a clear understanding of effective behavior - are thought to also apply to the interactional role-making processes that occur in teams. This literature also provides the conceptual background for two key dependent variables that are likely outcomes of these processes through which team

members structure their engagement in team leadership roles, namely role ambiguity and role conflict.

### *Summary*

In summary, role theory provides a useful background for helping to understand the nature of internal team leadership dynamics, especially for teams without a formal internal leader. By considering different ways in which team members may theoretically exercise leadership within teams, it is possible to examine the relationship between patterns of individual behavior, team member expectations, and resulting outcomes. I have argued that there are four important internal leadership roles - Navigator, Engineer, Social Integrator, and Liaison - that make up a comprehensive yet parsimonious typology of team leadership. However, the timing, pattern, and number of team members engaging in these leadership roles may have important effects on both the perceived value of the team members' leadership as well as their own personal experiences within the team, including the possible stress of role ambiguity and role conflict.

### **Chapter 3: Hypothesis Development**

Teams without a formal internal leader provide a clear opportunity for multiple team members to take on internal leadership roles within the team. The adoption of various team leadership roles will result in greater perceptions of individual contribution to the team by fellow team members. These perceptions are likely to be affected by certain boundary conditions, such as time periods in the team's developmental and task cycle as well as team level role conditions such as the level of role differentiation. Individual role-structuring processes also occur within teams and impact not only perceptions of individual contribution but also key individual attitudes, such as satisfaction with the team experience and role-related stress. In this chapter, I have developed three separate models in order to examine the three research questions posed in this dissertation. I will present each of these models in turn, as well as the development of specific hypotheses related to each model.

#### *Measurement of the existence and value of the four leadership roles – Model 1*

The first research question posed in this dissertation has to do with establishing and confirming empirically the existence and value of a concise set of internal team leadership roles. In Chapter 2, I presented a review and integration of the existing literature in order to articulate a comprehensive yet parsimonious set of team leadership roles that should be present in order to ensure effective team performance. This provides an important typology of the different ways in which leadership may be exercised on an informal basis within teams. These four internal team leadership roles are the Navigator, Engineer, Social Integrator, and Liaison.

To review, the Navigator role is concerned with establishing and maintaining a sense of purpose and direction for the team. The Engineer is responsible for structuring the team and its task in order to improve efficiency and effectiveness in accomplishing its purpose and meeting its task goals. The Social Integrator is concerned with assuring interpersonal harmony and productive relational processes within the team. The Liaison is responsible for developing and maintaining productive relationships with key stakeholders that are external to the team itself.

The first conceptual model (Figure 1 below) depicts the fact that these four leadership roles are valuable to teams because they enable teams to function more effectively; therefore, attributions of being a strong contributor are likely to accrue to individuals adopting team leadership roles.

**Figure 1**  
**Conceptual Model 1**



In order to move forward with a new typology of team leadership roles, it is important to be able to differentiate the dimensions of this construct at a minimum. These four team leadership roles are each distinct from one another conceptually, and each one represents a different way to exercise leadership and influence within the team. Thus, team members should be able to identify whether or not a team member is engaging in a particular leadership role at a given point in time. While the possibility

exists for certain team members to engage in more than one role through the process of role overlap (more on this in model 3), team members should still be able to recognize this phenomenon and identify who is engaging in each of the roles and associated behaviors. Therefore, I predict the following:

Hypothesis 1a: The four team leadership roles of Navigator, Engineer, Social Integrator, and Liaison will demonstrate high levels of agreement among team members regarding individuals that engage in these roles.

Hypothesis 1b: The four team leadership roles of Navigator, Engineer, Social Integrator, and Liaison will be conceptually distinct from one another.

These four internal leadership roles do not simply need to be conceptually and empirically distinct, but also need to be important as evidenced by significant relationships with important outcomes (criterion validity). Although perhaps not the primary reason for engaging in leadership, adopting internal team leadership roles should result in a greater reputation for contributing to the team (Marrone, 2004). Therefore, establishing the link between each of the four roles and individual contributions to the team is another important step in validating this typology of internal leadership roles.

Of the four roles, the Liaison role has the most extensive empirical and theoretical support. Work by Deborah Ancona has consistently demonstrated the importance of boundary-spanning behaviors for team performance (Gladstein, 1984; Ancona, 1990; Ancona and Caldwell, 1992). Recent work by Jennifer Marrone has also provided important evidence that boundary-spanning behaviors are strongly related to attributions of individual performance, influence, and contributions to the team by other team members across time (Marrone, 2004).

The importance of the Navigator, Engineer, and Social Integrator roles for individual contributions and influence is supported by some of the oldest empirical research on leadership behavior in organizational settings. Researchers at Ohio State and the University of Michigan found independently that two separate types of behavior were associated with leadership influence (Kahn & Katz, 1953; Stogdill & Coons, 1957). The first type of influential behavior, known as Initiating Structure, had to do with establishing task goals and direction, and also structuring workers and the work in ways that were efficient and effective. The second type, known as Consideration, represented efforts to attend to the social needs of individuals and groups. Researchers at Harvard University also similarly found that there were two types of leaders that emerged in experimental groups – one that was focused on task-oriented issues, and another that attended primarily to socio-emotional issues in the group (Bales, 1950; Bales & Slater, 1955). As a result of these studies, it became understood that leaders engage in goal-oriented behaviors, structuring of tasks and workers, and attending to relational issues, and also that those who do such things are perceived to offer strong contributions and influence to the point of being elected as a group leader. Thus, the three roles of Navigator, Engineer, and Social Integrator should also demonstrate a positive relationship with individual contributions and influence. Therefore, I predict the following:

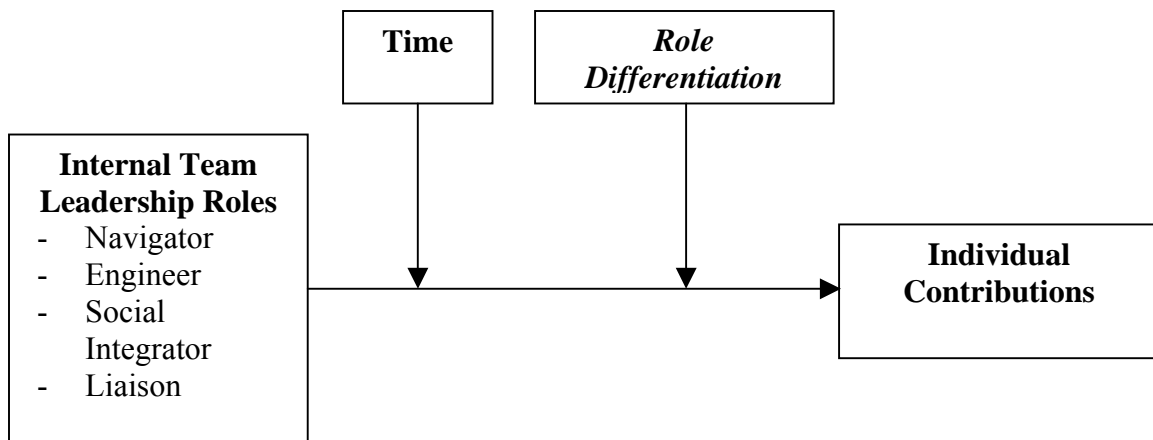
Hypothesis 1c: The four team leadership roles of Navigator, Engineer, Social Integrator, and Liaison will be significantly related to team members' ratings of an individual's contributions to the team.

#### *Moderators – Model 2*

In addition to a main effect of these four team leadership roles on perceptions of individual contributions to the team, it is also important to consider conditions that might

impact those effects. Therefore, I have chosen to include two key moderator variables at this early stage of better understanding internal team leadership dynamics. The first moderator is time, which has been chosen since the phenomenon of interest is an emergent one that is strongly tied to the team's stage of development. The second moderator included in this study is the structure or pattern of leadership roles at the team-level, known as role differentiation (McGrath, 1984; Reichers, 1987). The structure of leadership roles at the team level acts as an important contextual effect and provides constraints on the understanding each team member has about effective and valued behavior. These moderators are depicted in the second conceptual model of this dissertation (see Figure 2 below).

**Figure 2**  
**Conceptual Model 2**



#### *Time and its impact on the value of specific leadership roles*

Leadership in teams is likely to be a dynamic process as the team develops and engages with its task and with one another over time (Kozlowski et al., 1996). Therefore,



the need for and engagement in various team leadership roles is likely to change and shift throughout the team's life cycle. Different types and acts of leadership are likely to be more necessary for team effectiveness under specific times and circumstances.

Therefore, team leadership roles are more likely to be perceived as a valuable contribution to the team when they are exercised at the point of the team's greatest need. With this understanding, I have developed the following hypotheses specifying at which points in time (beginning, middle, or end of the team's life cycle)

The Navigator leadership role has to do with influencing the team towards the establishment of a clear purpose and direction in its work (Hackman & Walton, 1986). Intuitively, it makes sense that this would be most important early in the team's life. It is difficult to get somewhere without knowing where you are going, and this is the primary function of Navigator leadership in teams. In addition to initiating and energizing the team toward its purpose, Navigator leadership also involves establishing operational or task goals to enable effective focus, and the sooner these goals are made specific and challenging the more engaged the team will become (Locke and Latham, 1990). While it is also a Navigator's role to help the team stay focused and energized towards its purpose, and to make adjustments to changes in its environment and circumstances, the greatest need for this form of leadership should come in the beginning of the team's work together as the team is seeking to quickly establishing its initial goals, roles, and purpose (Gersick, 1988; Tuckman, 1965). Therefore, on the basis of these arguments, I make the following prediction:

Hypothesis 2a: Navigator role behaviors will be more strongly related to individual contributions at the beginning of a team's life cycle (T1 vs. T2 and T3).

The Engineer leadership role is a highly process-oriented team leadership role that has to do with managing the internal task and workflow dynamics of the team. This involves leading the implementation of a team's efforts – specifically who does what, and when. Once again, intuitively this seems more important at earlier stages of the team's life cycle than at the end when most of the process and work has already been carried out. Engineer leadership also involves efforts to match tasks to individual strengths in order to optimize individual contributions and team effectiveness (Hackman & Walton, 1986). While these implementation and task optimization efforts must be established early on, they are more likely to require changes and adjustments along the way as the team encounters hurdles and roadblocks. It is also possible for teams that have not worked together for very long that there will continue to be ongoing discoveries of the strengths and weaknesses of different team members. Thus, those engaging in Engineer leadership for the team may need to continue to “read and react” and clarify individual task roles and responsibilities as the work carries on (Zaccaro & Marks, 1999). The need to make adjustments may be particularly important at the midpoint of the team's lifecycle when it is more likely to be open to changes in the way it carries out its work (Gersick, 1988). Therefore, on the basis of these arguments, I make the following prediction:

Hypothesis 2b: Engineer role behaviors will be more strongly related to individual contributions at the beginning and middle of a team's life cycle (T1 and T2 vs. T3).

The Social Integrator leadership role is primarily concerned with the interpersonal processes of the team rather than the task processes. Social Integrator leadership involves developing and maintaining team cohesiveness and effectively managing conflict within

the team. There are two primary models of team development that are likely to help explain when the Social Integrator role offers the strongest contribution. The first is the classic model by Tuckman (1965) – forming, storming, norming, and performing. Forming involves establishing initial goals, roles, and purpose for the team, which is conceptually more linked to the Navigator role as discussed previously. Storming involves the presence of conflict, which is inevitable in any healthy functioning work team, and norming involves the effective resolution of this conflict and establishment of healthy norms of communication, collaboration, and collective involvement. The second primary model of team development is Gersick's (1988) punctuated equilibrium model. Her work found that teams tend to establish norms fairly quickly and that these initial patterns of interaction persist in equilibrium until they are punctuated at approximately the midpoint of the team's work. At this midpoint, teams are more likely to step back and re-evaluate their approach to their work and make any necessary changes. During this period of re-evaluation there is likely to be additional conflict that takes place as the team norms are open for discussion.

These two models offer potentially competing explanations for when the Social Integrator leadership role may provide the greatest contribution. Tuckman's (1965) model seems to suggest that conflict will occur fairly early in a team's life, whereas Gersick's model would suggest that the need for Social Integrator leadership is greatest at the midpoint of the team's life when the norms are in flux. However, the teams in the sample for this dissertation are ad hoc consulting teams rather than intact ongoing work teams, and are being sampled after having only met once or twice at Time 1. Thus, they are more likely to be in the forming stage of Tuckman's model at this point and seeking

to gain focus and direction on the task, so the Social Integrator leadership role is less likely to be perceived as a valuable contribution. However, around the midpoint of the project these teams will have received feedback from their clients and are much more likely to have conflict that has become overt which will make the benefit of Social Integrator leadership more salient and valued to the team. Therefore, on the basis of these arguments, I make the following prediction:

Hypothesis 2c: Social Integrator role behaviors will be more strongly related to individual contributions at midpoint of a team's life cycle (T2 vs. T1 and T3).

The Liaison leadership role is primarily concerned with management of a team's external linkages with key stakeholders. This could involve establishing key relationships if they do not exist, or it could involve maintaining appropriate levels of contact and information flow with those that do. This type of leadership is strongly connected to the work on boundary spanning in teams, which has shown these types of activities to be critical for team effectiveness (Ancona, 1990; Ancona & Caldwell, 1992; Gladstein, 1984). Ancona's work found that boundary spanning activity was necessary to maintain across time. Similarly, work by Druskat & Wheeler (2003) has shown that the difference in the best leaders of self-managing work teams was their engagement in boundary spanning behaviors throughout the team's life cycle. Given the critical importance of this function in teams, and the fact that this type of leadership has been found to be important throughout a team's work, I make the following prediction:

Hypothesis 2d: Liaison role behaviors will be related to individual contributions throughout a team's life cycle (relationships will be significant at T1-T3, and will show no significant difference between magnitude of relationships at T1, T2, and T3).

*Team role differentiation as a cross-level moderator*

At the team level, the degree of role differentiation will likely affect the strength of the relationships between team leadership role adoption and individual contributions. The structure of leadership roles at the team level is a very important moderator to consider, because it helps to establish patterns of expectation and communication among team members (Levesque, Wilson, & Wholey, 2001). The structure and distribution of these roles at the team level will also place significant constraints on team members' ability to structure or manage their own roles at the individual level.

Role differentiation is defined as the structure or pattern of relationships, behaviors, and expectations within the team (McGrath, 1984). Teams with a high level of role differentiation have a clear and distributed leadership role structure that is characterized by team members consistently looking to certain specific team members for each of the four types of team leadership. In order to be differentiated, the role structure must be clear so that team members have clear expectations of precisely who will provide each of the four types of leadership. The role structure must also be distributed among team members rather than concentrated in one or two individuals so that there are distinct expectations for each emergent leader in terms of the type of leadership they will exercise. It may be possible for teams to have two or more individuals sharing each of the four leadership roles, especially in teams of larger size, but the roles will still be dispersed evenly across these team members.

On the other hand, teams with a lower level of role differentiation will exhibit patterns of greater concentration of team leadership roles. This would likely take on the form of one or two leaders emerging to absorb multiple internal team leadership roles (Bales, 1950; Bales & Slater, 1955). Teams may also demonstrate a more moderate level

of role differentiation where multiple leaders emerge, but the pattern is not evenly distributed across the four roles. For example, if one member was engaging in both Navigator and Engineer roles, two members were engaging in the Social Integrator role, and three members were engaging in the Liaison role, this would represent a moderate level of role differentiation.

In order for high levels of role differentiation to occur, there is likely to be some discussion surrounding who is engaging in various leadership roles. While this may not take the form of formalizing these roles (i.e., teams may not officially elect or designate members to be the Navigator, Engineer, etc.), there should be a shared understanding (Cannon-Bowers, Salas, & Converse, 1993; Mathieu et al., 2000) about which members are exercising leadership influence and in what ways. When there is a high level of team role differentiation around the leadership function, there will be a leadership structure in place that is dispersed throughout the team and clear to all team members.

Differentiation of team leadership roles will serve to strengthen the existing relationships between these leadership roles and individual contributions (H1c). Team role differentiation affects communication patterns, which affect the relationship between enactment of role behaviors and perceptions of role behaviors by other team members (Levesque et al., 2001). As team members engage in particular leadership roles, they begin to provide communications to the team that are relevant to their role. As they begin to communicate and exercise one of the four types of leadership influence, the team will begin to expect this type of leadership from this individual. Thus, when roles are well defined and highly differentiated across team members, this should create clearer

communication within the team and clearer expectations for how different members are exercising influence within the team. Therefore, I predict the following:

Hypothesis 3: Team-level role differentiation will strengthen the existing relationships between team leadership roles and individual contributions.

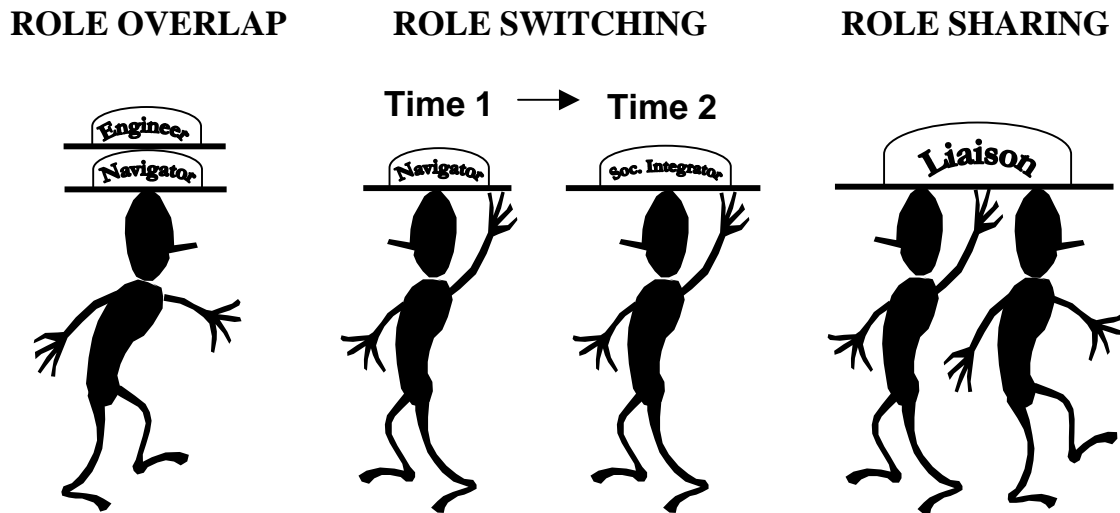
### *Individual Role-Structuring Processes – Model 3*

My third broad research question has to do with the possible benefits and consequences of individual role-structuring processes. In this dissertation, I test three of these role-structuring processes: two that represent forms of within-member role management and one that represents a form of between-member role management. The within-member role-structuring processes are referred to as role overlap and role switching, and the between-member role-structuring process is called role sharing. Figure 3 (below) illustrates the difference between these three role-structuring processes by showing which “leadership hats” are being worn by team members at which time.

Since I am examining informal team leadership roles, there are several possibilities for how these emergent leadership roles might be distributed among team members. For example, classic teams research found that teams often adopt two leaders (Bales, 1950; Bales & Slater, 1955) – one that focuses more on task-related issues (e.g., Navigator and Engineer roles) and another that focuses on more socio-emotional issues (e.g., Social Integrator role). However, an individual may take on more than one type of leadership role, or may find him/herself shifting from one leadership role to another as the team’s needs and expectations change over its lifecycle. It is also possible that more than one individual may engage in the same leadership role at the same time. Thus, in addition to the potential impact of adopting certain specific leadership roles, there are

also likely to be important outcomes that result from the manner in which individuals structure their engagement in various roles within the team.

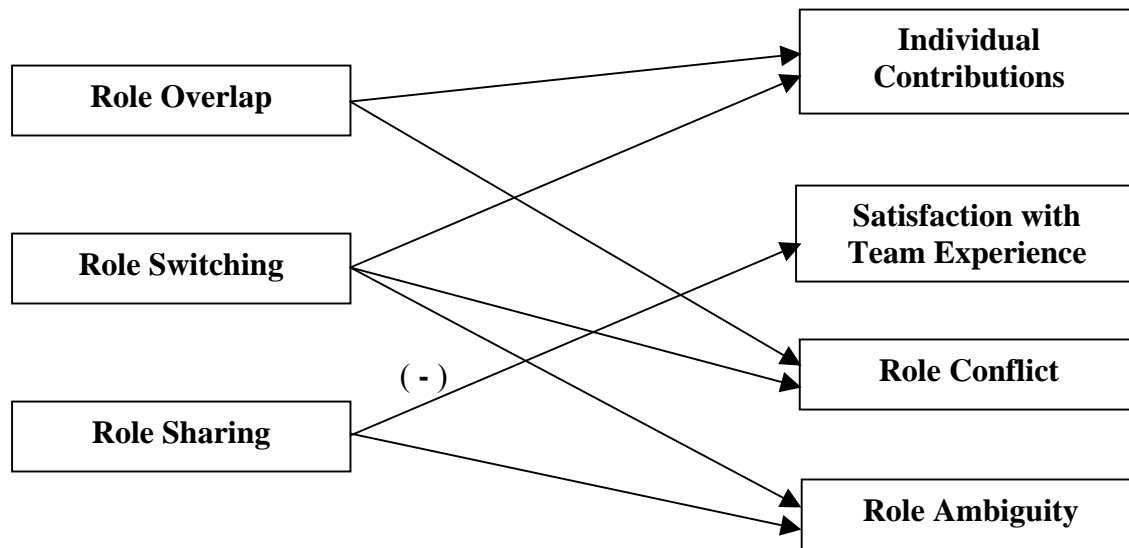
**Figure 3**  
**Role-structuring Processes**



The third conceptual model (see Figure 4 below) demonstrates how the manner in which individuals structure or manage their adoption of various leadership roles will affect their experiences in different ways. Team members may engage in more than one leadership role simultaneously (role overlap), may shift from one role to another over time (role switching), or may share roles with other team members (role sharing). These processes will provide opportunities and constraints on what team members are able to accomplish and will therefore affect the team's attributions of individual contributions, as well as their own personal experiences of satisfaction and role-related stress.



**Figure 4**  
**Conceptual Model 3**



*Within-member role management and individual outcomes*

Some individual team members may simultaneously take on more than one leadership role within the team. Role overlap is defined here as the process of engaging in more than one internal leadership role by a single team member at a single point in time. This may happen for at least two main reasons. The most likely reason is that the team may feel a certain individual is the best suited for providing more than one leadership role to the team. This idea is consistent with early teams research by Bales & Slater (1955) that found teams to have only two emergent leaders – task and socio-emotional. The task leader would likely encompass at least the Navigator and Engineer roles, which would cause that individual to experience role overlap. Sometimes the teams in these studies had only one emergent leader that encompassed both task and socio-emotional roles, which would be an example of an even higher degree of role overlap.

A second reason that team members may engage in multiple leadership roles at the same time is because they have either personality traits or motivational needs that make them more likely to step up and take charge in as many ways as possible. Individual differences such as extraversion (e.g., Judge & Bono, 2000; Taggar et al., 1999), proactive personality (e.g., Stogdill, 1948), and needs for power and achievement (House, Spangler, & Woycke, 1991; McClelland, 1975) relate to leadership emergence, and these kinds of characteristics may cause individuals to seek out leadership in team settings. This may be due to strong beliefs in their ability to provide the most effective leadership for the team, or it may be due to a desire to be in control and have power. Concern for the moral exercise of power (House et al., 1991; McClelland, 1975) is likely to determine which of these motivations is primary.

Regardless of the reason, when team members engage in multiple leadership roles at the same time, there are likely to be a number of consequences to them as individuals. First, role overlap is likely to result in a general perception of being a strong contributor to the team. When team members send expectations of leadership to individuals and those expectations are met by engagement in leadership roles, the team will typically confer a higher status to that team member (Brass, 1984; Brass & Burkhardt, 1993). Therefore, taking on additional leadership roles should result in even stronger perceptions of individual contributions for that individual. Therefore, on the basis of these arguments, I make the following prediction:

Hypothesis 4a: Role overlap will be positively related to team members' ratings of an individual's contributions to the team.

However, there may also be negative consequences for those engaging in multiple roles. As a result of trying to perform more than one role at a time, team members may find themselves receiving multiple expectations and requests from various team members. Sometimes these requests may be incompatible, or perhaps impossible to perform simultaneously due to time and other constraints. When this occurs, the member is likely to experience role conflict and accompanying stress (Jackson & Schuler, 1985; Tubre & Collins, 2000) as they feel pulled in more than one direction. Therefore, I make the following prediction:

Hypothesis 4b: Role overlap will be positively related to the degree to which an individual experiences role conflict.

Some team members may also take on more than one leadership role in the team, but instead of overlapping, their role may change from one type of role to another across time. Role switching is defined here as the process of switching from one internal team leadership role to another across time by a single team member. This is most likely to occur due to changes in the developmental and task performance needs of the team. As teams develop and move along in their task cycle, their leadership needs are likely to change (Kozlowski et al., 1996). Individuals that are skilled in multiple areas may switch leadership roles in order to assist the team with its most pressing need at a particular point in time. For example, a team member may engage in the Navigator role in order to help set the team's direction early in its lifecycle, but once the team is actively pursuing its purpose this person may need to switch and take on a Social Integrator role to help the team resolve interpersonal conflict that is becoming disruptive.

A second reason that team members may switch leadership roles is because there may be more than one team member sharing a single role (more on this phenomenon below) while other leadership roles are going unperformed. For example, two members may be sharing the Engineer role early on and working together to structure the team and its work in efficient and effective ways, but there may be no member exercising the Liaison role and leading the team to establish and maintain useful relationships with outside stakeholders. Thus, one of these team members may need to switch from the Engineer to the Liaison role in order to ensure that this critical leadership role is being performed.

A third reason that team members may switch roles is due to a lack of acceptance of their leadership and influence by the team in a particular role. This could be due to a lack of skill in successfully exercising a particular leadership role. For example, an individual may initially take on the Engineering role, but lack the organizational skills to arrange and distribute the team's tasks in an efficient and effective way. Another reason the team may not accept a member's leadership in a particular role may be individual differences in personality or style. For example, a team member may be strong-willed and dominant and quickly take on the Navigator role, but may prove to be too controlling or pushy if most of the team prefers a more empowering approach. It is important to note that engaging in a particular leadership role and then failing to exercise any type of leadership is not an example of role switching, since there is not a new leadership role that is being adopted in this case.

When team members switch leadership roles there are again likely to be a number of consequences to them as individuals. First, role switching may result in stronger

perceptions of an individual's contributions to the team by fellow team members. If team members are willing to meet team needs by making personal adjustments, this is a sign of cooperation and team-mindedness (Pulakos, Arad, Donovan, & Plamondon, 2000). Just as taking on more than one leadership role should result in being perceived as a stronger contributor, so also should those who are willing to be flexible and change from one leadership role to another have high value within the team (Yorges, Weiss, & Strickland, 1999). However, it is worth noting that this adjustment to meet team needs may represent a sacrifice to the individual, which could result in reduced motivation and possibly a poor fit with the new leadership role. If team members are switching leadership roles due to a lack of acceptance or poor fit with a particular role, this may still result in greater perceptions of contributions to the team. The fact that the team is willing to recognize a different type of leadership from an individual that was not performing well in a previous role indicates that this person is still very influential, and finding a better leadership "fit" should lead to positive contributions from this member. However, it is also worth noting that switching leadership roles due to poor fit may also be a sign of either incompetence or that someone is struggling to find their leadership "niche" within the team, and may therefore not result in increased contributions to the team. Nonetheless, I expect the improvement in contributions to be the prevailing situation in the consulting teams being studied and thus make the following prediction:

Hypothesis 5a: Switching leadership roles across time will be positively related to team members' ratings of an individual's contributions to the team.

However, there is likely to be added stress for individuals who switch roles across time, for whatever reason. These individuals may find themselves continuing to receive

expectations from team members related to their previous role, while simultaneously being given requests and looked to for leadership in their current role. Once again these requests may often be incompatible, or perhaps impossible to perform simultaneously due to various constraints, resulting in role conflict and stress (Jackson & Schuler, 1985). In addition to role conflict, team members who engage in role switching are more likely to experience a high degree of role ambiguity as their expectations and responsibilities may not be as clear since they have changed mid-stream. This is extremely likely during the time period immediately following the switch. Therefore, on the basis of the above arguments, I make the following predictions:

Hypothesis 5b: Switching leadership roles across time will be positively related to the degree to which an individual experiences role conflict.

Hypothesis 5c: Switching leadership roles across time will be positively related to the degree to which an individual experiences role ambiguity.

#### *Between-member role management and individual outcomes*

At times, there may be multiple team members adopting the same leadership role. Role sharing is defined here as engaging in the same leadership role as another team member at the same point in time. The existence of shared leadership in teams has been previously examined, and research has shown that teams may share the leadership function among members (e.g., Carson, Tesluk, & Marrone, 2005; Pearce & Sims, 2002). There has also been evidence that more than one team member may engage in Liaison behaviors within the same team lifecycle (Marrone, 2004). For example, two members may share the Liaison role by developing and maintaining relationships with unique external stakeholders, such as an external client and an internal project manager or

executive. Alternatively, perhaps two members may share the Engineer role and work together to structure the team and its work in efficient and effective ways. Role sharing is most likely to occur in teams that are larger in size (e.g., Carson et al., 2005; Day, Gronn, & Salas, 2004) and in teams whose members have similar expertise and/or functional backgrounds (Bunderson & Sutcliffe, 2002).

When team members share leadership roles there are again likely to be a number of consequences for each individual. Team members that engage in the process of role sharing are likely to be less satisfied with the team experience. They may have engaged in a particular leadership role out of a natural preference for that type of influence in teams. Thus, they may feel less motivated and valued if their contributions are shared with another team member, and they may or may not agree on how to most effectively perform the leadership role. A key tenet of job characteristics theory is that individuals are more motivated when they have a high degree of identity with their task (Hackman & Oldham, 1976). When team members share a leadership role it may be less clear what each of them are supposed to do in seeking to perform that role. Many people do not like to share their glory or responsibilities with others (McClelland, 1975). However, it is worth noting that some team members may actually find greater satisfaction by sharing a leadership role with a fellow team member as a result of a reduced burden of leadership for each individual. There could also be some intrinsic value to sharing a leadership role, particularly for team members with a high need for affiliation (McClelland, 1975) or when there is a strong positive relationship with other team members sharing the role. Nonetheless, I expect role sharing to have a negative effect on satisfaction with the team experience in my sample of consulting teams as a result of reduced identification with the

leadership role and reduced credit by fellow team members for providing a valuable source of leadership, and on the basis of the above arguments, I make the following prediction:

Hypothesis 6a: Role sharing will be negatively related to the degree to which an individual is satisfied with the team experience.

There may also be additional role stress for team members who share roles. Although role conflict is unlikely, as each team member should be receiving role-consistent requests and expectations from teammates, team members who share roles are more likely to experience role ambiguity. Since more than one member is engaging in the same role, it may be less clear to each one what they are expected to contribute. Since their leadership responsibilities may not be clearly defined, they may have a difficult time knowing exactly how to divide their role or collaborate harmoniously with one another. Therefore, I make the following prediction:

Hypothesis 6b: Role sharing will be positively related to the degree to which an individual experiences role ambiguity.

In summary, I make a number of hypotheses related to internal team leadership roles and individual outcomes of engaging in and structuring those leadership roles. I also hypothesize moderating effects for both time and for role differentiation at the team level. I present a summary of the study hypotheses in Table 3 on the following page.



**Table 3**  
**Summary of Study Hypotheses**

Hypothesis 1a: The four team leadership roles of Navigator, Engineer, Social Integrator, and Liaison will demonstrate high levels of agreement among team members regarding individuals that engage in these roles.

Hypothesis 1b: The four team leadership roles of Navigator, Engineer, Social Integrator, and Liaison will be conceptually distinct from one another.

Hypothesis 1c: The four team leadership roles of Navigator, Engineer, Social Integrator, and Liaison will be significantly related to team members' ratings of an individual's contributions to the team.

Hypothesis 2a: Navigator role behaviors will be more strongly related to individual contributions at the beginning of a team's life cycle (T1 vs. T2 and T3).

Hypothesis 2b: Engineer role behaviors will be more strongly related to individual contributions at the beginning and middle of a team's life cycle (T1 and T2 vs. T3).

Hypothesis 2c: Social Integrator role behaviors will be more strongly related to individual contributions at midpoint of a team's life cycle (T2 vs. T1 and T3).

Hypothesis 2d: Liaison role behaviors will be related to individual contributions throughout a team's life cycle (relationships will be significant at T1-T3, and will show no significant difference between magnitude of relationships at T1, T2, and T3).

Hypothesis 3: Team-level role differentiation will strengthen the existing relationships between team leadership roles and individual contributions.

Hypothesis 4a: Role overlap will be positively related to team members' ratings of an individual's contributions to the team.

Hypothesis 4b: Role overlap will be positively related to the degree to which an individual experiences role conflict.

Hypothesis 5a: Switching leadership roles across time will be positively related to team members' ratings of an individual's contributions to the team.

Hypothesis 5b: Switching leadership roles across time will be positively related to the degree to which an individual experiences role conflict.

Hypothesis 5c: Switching leadership roles across time will be positively related to the degree to which an individual experiences role ambiguity.

Hypothesis 6a: Role sharing will be negatively related to the degree to which an individual is satisfied with the team experience.

Hypothesis 6b: Role sharing will be positively related to the degree to which an individual experiences role ambiguity.

## **Chapter 4: Research Methods**

In order to test the foregoing hypotheses, I employed a multilevel longitudinal research design using a sample of consulting teams. This chapter describes my sample and its appropriateness, the data collection procedures, measures, and an overview of analytical procedures.

### *Sample*

I collected data using a sample of 127 MBA students organized into 24 consulting teams at a large eastern university (ranging from 5-7 members, with a modal team size of 5 members, mean size = 5.29.) The sample was 62.2 percent male, and ages ranged from 25 to 42, with a mean age of 30.23 years. The sample was predominantly Asian (47.2 percent) and White (44.1 percent), with small proportions of Black (4.7 percent) and Hispanic (3.9 percent) individuals.

As part of the university's MBA program, all second year MBA students are required to participate in a semester-long consulting engagement for course credit. Each team is engaged to address a specific current business need or problem of the client organization in exchange for a consulting fee. Client organizations stay involved with the team throughout the project and evaluate the final recommendations made by the consulting teams, and subsequently implement them as deemed appropriate. Thus, the client expectations are the same as they would be for other similar engagements, and the consulting experience is authentic for the MBA students involved in the projects. Clients typically range from Fortune 500 companies to government agencies to entrepreneurial ventures, but the scope of the projects is arranged to be as similar as possible. The goal is

to provide an actual engagement that offers value for the client as well as valuable experience for the student.

Students are assigned to consulting teams by the MBA Consulting Program office based on their academic area of concentration and previous work experience. Project teams are multifunctional in terms of team members' areas of concentration and expertise, and the Consulting Program office seeks to build teams with complementary interests and skills that fit the needs of each client. Teams are generally composed of diverse types of expertise as well as demographic characteristics due to the diversity inherent in the student body. Teams are often required to utilize this diversity in order to effectively meet client needs.

Each team is assigned a faculty advisor who serves as an external leader, and who also assigns grades to each team member. These faculty advisors act much like a partner in a consulting firm who supervises multiple projects; they are available to provide general guidance, advice, and support for the team in working with the client throughout the course of the project. Thus, the teams are predominantly self-managing, but do benefit from the external leadership and oversight provided by these faculty advisors.

This sample was well suited to testing my hypotheses for a number of reasons. First, the nature of the team task was highly similar and the team life cycle was identical across teams, thus ruling out these mitigating factors often present in field-based team research. This was particularly important for the longitudinal nature of the study, as it provided the opportunity to sample the teams at the same points in their development as a team and their work on the project.

Second, teams were engaged in actual consulting projects with real organizations and worked closely with their clients in a 5-month consulting engagement that concluded with a significant deliverable (a presentation to the client and an accompanying report). The teams were structured in a manner very similar to existing for-profit consulting firms and faced the same types of time pressures, aggressive deadlines, competing demands, ambiguous client expectations, and shifts in project scope that consulting professionals are faced with on a routine basis. They were also required to coordinate initial planning meetings with the client and completed a signed letter of engagement outlining the agreed-upon scope and expectations for the project. Therefore, the likelihood that the findings of this study are generalizable to non-student populations, particularly those engaged in knowledge work, was greatly enhanced.

Third, these teams had neither a formally appointed internal leader nor a formally imposed internal leadership structure. The only formal team roles imposed by the Consulting Program were liaison roles (to the client and the faculty advisor), which were designed to create a single point of contact and facilitate efficient communications between the team and these key stakeholders. As described in Chapter 1, the lack of a designated formal internal leader allowed for the emergence of different leadership roles by different team members. The lack of an imposed leadership structure also meant that any team member was free to enact any leadership role at any point in time, or that the team could freely decide to formalize a role structure as it deemed necessary. As a result there was opportunity for variance in the existence and enactment of the various leadership roles being tested, the structuring of those roles by individuals and the team,

and the degree of team-level role differentiation, as well as variance in the relationships between these factors and various individual team member outcomes.

#### *Data Collection Procedures*

I relied primarily on a survey methodology to investigate the research questions posed in this dissertation. Data from teams was collected through surveys administered at three different points in time: near the beginning, midpoint, and end of the projects. During week 3 of their projects, Survey 1 was administered to the teams online. Survey 2 was administered in person during regularly scheduled team meetings near the midpoint of the project and immediately following the mid-point presentation to clients. Finally, Survey 3 was administered to teams online upon the completion of the final deliverable presentations to the clients. Data for the focal variables in this dissertation were collected at each of these three points in time in order to consider how they were affected by the team's lifecycle and stage of development (Ployhart, Holtz, & Bliese, 2002). The response rates were 100% for Survey 1, 99% for Survey 2, and 97% for Survey 3.

The University provided human subjects approval prior to administering surveys to team members. The MBA Consulting Program Office made participation in the three-part survey process mandatory in exchange for providing developmental feedback reports at the conclusion of the project (including data for this dissertation as well as additional team data collected for the purpose of the feedback reports.) In accordance with IRB guidelines, participation in this dissertation study was voluntary and signed informed consent forms were obtained from each participant in order to authorize use of their data for this research. In order to minimize the possibility of social desirability biases and encourage honest responses, the participants were informed that their responses would

not be seen by their faculty advisors or clients, and in no way had an impact on their grades or client evaluations.

### *Measures*

Established scales were used to measure as many constructs of interest as possible. Unless otherwise noted, measures were in the form of a five-point Likert scale (1 = strongly disagree; 2 = somewhat disagree; 3 = neutral; 4 = somewhat agree; 5 = strongly agree). Cronbach's alpha was calculated for all scale measures in order to demonstrate acceptable levels of scale reliability. For measures that represented aggregate views of team members,  $r_{wg}$ , ICC(1), and ICC(2) calculations were performed to demonstrate adequate levels of inter-rater agreement within teams, inter-rater reliability, and reliability of team-level means (James, Demaree, & Wolf, 1993; Shrout & Fleiss, 1979). Measures of all study variables are listed in Appendix 1. Table 4 presents descriptive and aggregation statistics for all study variables.

Models 1 and 2 of the study (see pp. 41 and 44) involve independent variables (the four leadership roles) and a dependent variable (individual contributions) that are measured concurrently by team members at each of the three points in time (T1, T2, and T3). In order to reduce the likelihood of common method bias inflating the observed relationships, team members were randomly split into two separate subgroups for measurement of these variables (see Hofmann & Stetzer (1996) for an example using this methodology). Thus, half of each team was randomly selected to be the raters for the four leadership roles within their team, and the other half of each team was selected to be the raters for individual contributions. Once randomly selected, these two rater

subgroups remained constant across all three points in time.<sup>1</sup> It is important to note that the decision to use this split sample approach is likely to result in more conservative estimates of the significance of findings from hypothesis testing.

**Internal team leadership roles.** Since this was a primary focus of this study and these four internal leadership roles have not been previously articulated as a coherent set, there was naturally no existing measure for this construct. Therefore, I developed a measure of this construct for the purposes of this dissertation. The measure employed a response matrix designed to capture ratings of all other team members for each of the four internal leadership roles. For each role, I provided a concise definition and a few brief behavioral examples of what this role might involve. The four roles were listed on the left hand side of the response matrix in rows and each team member's name was listed as the heading for a column across the top. Each team member rated all other team members on the extent to which the focal individual engaged in each of the four leadership roles. Items were scored using the response format of 1 = not at all, 2 = to a little extent, 3 = to some extent, 4 = to a great extent, and 5 = to a very great extent. An individual's score for each team leadership role was his or her average rating on that role by the subgroup of the team members randomly selected to provide the leadership role ratings within that team. Since these ratings were aggregated together,  $r_{wg}$ , ICC(1), and ICC(2) values were calculated in order to assess within-group agreement and the substitutability of raters. These values are presented in Table 4 and, overall, suggest acceptable levels of agreement and inter-rater reliability.

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<sup>1</sup> For comparison purposes, analyses in the dissertation were also run using the full team's mean ratings for both the leadership role variables and the contributions variable. The pattern of findings was consistent with the split sample approach that I employed, providing evidence that the split sample results presented in the next chapter are not being influenced by selection bias resulting from the specific team members which were assigned to the two subgroups.

**Individual contributions.** Individual contributions on the project were assessed through peer ratings of each target individual, based on work done by Marrone (2004). This measure was also in the form of a matrix that listed names of the team members in columns across the top of the matrix and listed scale items in rows down the left-hand side of the matrix. Each team member provided ratings for all other team members by answering questions regarding with the stem, “At this point in time, to what extent has this team member...” Each item was scored using the response format of 1 = not at all, 2 = to a little extent, 3 = to some extent, 4 = to a great extent, and 5 = to a very great extent. Four items related to individual contributions were adapted from the existing Marrone (2004) scale. A sample item is, “provided high quality contributions to the project.” An individual’s score for contributions was his or her average rating on this scale by the subgroup of team members that were randomly selected to provide ratings for contributions within that team. Exploratory factor analyses using principal components with varimax rotation supported a single factor solution at all 3 points in time. Since ratings on this scale were then aggregated together,  $r_{wg}$ , ICC(1), and ICC(2) values were calculated in order to assess within-group agreement and the substitutability of raters. These values are presented in Table 3 and suggest acceptable levels of agreement and inter-rater reliability. Table 4 also presents values for Cronbach’s alpha, which suggest acceptable levels of inter-item reliability.

**Role overlap.** Role overlap is the enactment of more than one internal leadership role by a single team member at a single point in time. This measure was also based on the matrix measurement approach previously described above. Each team member rated all other team members at each point in time on the following statement: “Currently, this



person is engaging in more than one of the four leadership roles described above.” The item was scored using the response format of 1 = not at all, 2 = to a little extent, 3 = to some extent, 4 = to a great extent, and 5 = to a very great extent. An individual’s score for role overlap was his or her average rating on that role by all other team members. Since these ratings were aggregated,  $r_{wg}$ , ICC(1), and ICC(2) values were calculated in order to assess within-group agreement and the substitutability of raters. These values are presented in Table 4 and suggest acceptable levels of agreement and inter-rater reliability.

**Role switching.** Role switching is the enactment of two or more different internal leadership roles during at least two different points in time by a single team member. This measure was also based on the matrix measurement approach previously described above. Each team member rated all other team members on the following statement: “Since the first few weeks of the project, this person’s leadership role on the team has shifted from one role to another.” The item was scored using the response format of 1 = not at all, 2 = to a little extent, 3 = to some extent, 4 = to a great extent, and 5 = to a very great extent. An individual’s score for role switching was his or her average rating on that role by all other team members. (This item was not measured at Time 1 since by definition an individual must switch roles across two different time periods.) Since these ratings were aggregated,  $r_{wg}$ , ICC(1), and ICC(2) values were calculated in order to assess within-group agreement and the substitutability of raters. These values are presented in Table 4 and suggest generally acceptable levels of agreement and inter-rater reliability.<sup>2</sup>

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<sup>2</sup> ICCs were negative for role switching at Time 3, and  $r_{wg}$ s were somewhat low, suggesting possible frog-pond effects for this variable at Time 3. However, since these statistics were acceptable at Time 2 and seem to indicate possible clustering of perceptions at Time 3, the decision was made to move forward with substantive analyses while keeping an eye on this possible frog-pond effect at Time 3.

**Role sharing.** Role sharing is a between-member role-structuring process where two or more different team members enact a single team leadership role at the same point in time. This measure was also based on the matrix measurement approach previously described above. Each team member rated all other team members on the following statement: "Currently, this person is sharing at least one of the four leadership roles described above with another team member." The item was scored using the response format of 1 = not at all, 2 = to a little extent, 3 = to some extent, 4 = to a great extent, and 5 = to a very great extent. An individual's score for role sharing was his or her average rating on that role by all other team members. Since these ratings were aggregated,  $r_{wg}$ , ICC(1), and ICC(2) values were calculated in order to assess within-group agreement and the substitutability of raters. These values are presented in Table 4 and suggest acceptable levels of agreement and inter-rater reliability.

**Satisfaction with team experience.** Satisfaction with the team experience was measured with a three-item Likert scale (Gladstein, 1984): "I am satisfied with my present colleagues," "I am pleased with the way my colleagues and I work together," and "I am very satisfied with working in this team." Exploratory factor analyses using principal components with varimax rotation supported a single factor solution at all three points in time. Table 4 presents values for Cronbach's alpha, which suggest acceptable levels of inter-item reliability.

**Role conflict.** Role conflict was measured using 5 items that were adapted from the Rizzo, House, and Lirtzman (1970) and House, Schuler, and Levanoni (1983) measures. A sample item is, "I often receive incompatible requests from two or more people associated with my team (can include requests/expectations from clients, advisor,

etc.)” Exploratory factor analyses using principal components with varimax rotation supported a single factor solution at all three points in time. Table 4 presents values for Cronbach’s alpha, which suggest acceptable levels of inter-item reliability.

**Role ambiguity.** Role ambiguity was measured using 5 items that were adapted from the Rizzo, House, and Lirtzman (1970) and House, Schuler, and Levanoni (1983) measures. A sample item is, “I know exactly what is expected of me on this team.(R)” Exploratory factor analyses using principal components with varimax rotation supported a single factor solution at all three points in time. Table 4 presents values for Cronbach’s alpha, which suggest acceptable levels of inter-item reliability.

**Role differentiation.** Role differentiation refers to the structure or pattern of roles within the team (McGrath, 1984; Reichers, 1987). The measure of role differentiation was based on work by Levesque and colleagues (2001). Role differentiation was measured as the overall variance in internal team leadership roles, and was based on the matrix measures described above for each of the four roles. Consistent with Levesque and colleagues (2001), I calculated the mean variance across all four roles within each team at each time period, which represents a dispersion measure according to Chan’s typology (Chan, 1998). First, I calculated the variance of the Navigator role scores for each team at a particular time, and then did the same for the Engineer, Social Integrator, and Liaison roles at that same time period. Once all four variances were calculated for each team, I took the mean of these four variances at a single time period and used it as the measure of role differentiation at that particular time.

**Control variables.** In order to diminish the possible alternate explanation that central study variables such as engagement in leadership roles, individual contributions,

role stress, or satisfaction with the team are a function of individual demographics, I provided measures of several key demographic variables previously shown to be related to individual behaviors and attitudes (e.g., Tsui, Egan, & O'Reilly, 1992). Individual-level controls were included for the effects of *age* (in years, measured at the beginning of the project), *Asian* status (dummy coded as 0 = white, 1 = Asian), and *GPA* (as an additional proxy for ability) in all regression and HLM analyses.<sup>3</sup>

### *Analytical Procedures*

The primary statistical technique that I used to test the hypotheses in this dissertation is multiple regression. Since I presented three separate models in my theory to address each of the research questions of interest, I ran tests of each model separately.

The data for my dissertation comes from individuals nested within teams, so the statistical technique that I used for testing moderation in model 2, which involves cross-level relationships, was hierarchical linear modeling (HLM). HLM allowed me to test the relationships between individual-level and team-level predictors and individual-level outcomes, as well as the existence of cross-level moderating effects. HLM is able to simultaneously model within-person, within-team, and between-team variance, and thus provides an advantage over ordinary least squares regression in that it is able to bypass the assumptions of homogeneity of regression slopes and independence of error terms (Raudenbush & Bryk, 2002).

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<sup>3</sup> I also included control variables for *gender* (coded as 0 = female, 1 = male), *GMAT* score (as an additional proxy for ability), and dummy variables for *Black* and *Hispanic* races in all analyses. Gender was not a significant predictor of any of the DVs (at  $\alpha = .05$ ) and was thus removed from further consideration. GMAT was only related to role switching at Time 2 ( $\beta = .20, p > .05$ ) and was therefore also removed from further consideration. There were a few isolated cases where Black and Hispanic race variables were significant predictors, but they did not influence the overall results and were therefore not included in order to preserve degrees of freedom due to the relatively small sample size. I had originally intended to include dummy codes for *functional background* as a possible additional control, however I was unable to obtain this data due to technical problems resulting from the transition to a new Coordinator Program.

**Table 4**  
**Descriptive Statistics, Scale Reliabilities,  $r_{wg}$ s, and ICCs for Study Variables**

		N	Mean	SD	# Items	$\alpha$	Mean $r_{wg}$	Median $r_{wg}$	ICC(1)	ICC(2)
1.	Age	125	30.23	3.43	1	--	--	--	--	--
2.	GPA	125	3.60	.22	1	--	--	--	--	--
3.	Asian	127	.47	.50	1	--	--	--	--	--
4.	Navigator – T1	127	3.26	.82	1	--	.63	.65	.17	.52
5.	Social Integrator – T1	127	3.18	.69	1	--	.56	.65	.07	.27
6.	Liaison – T1	127	3.26	.92	1	--	.57	.65	.27	.66
7.	Engineer – T1	127	3.22	.76	1	--	.58	.65	.12	.41
8.	Navigator – T2	127	3.58	.98	1	--	.64	.71	.37	.76
9.	Social Integrator – T2	127	3.58	.94	1	--	.54	.65	.16	.51
10.	Liaison – T2	127	3.58	1.11	1	--	.58	.65	.42	.80
11.	Engineer – T2	127	3.56	.90	1	--	.57	.65	.22	.60
12.	Navigator – T3	127	3.63	.96	1	--	.61	.65	.35	.74
13.	Social Integrator – T3	127	3.52	.86	1	--	.52	.60	.17	.53
14.	Liaison – T3	127	3.33	1.01	1	--	.45	.50	.26	.65
15.	Engineer – T3	127	3.43	.93	1	--	.48	.52	.17	.52
16.	Ind. Contributions – T1	127	3.48	.71	4	.92	.83	.92	.09	.20
17.	Ind. Contributions – T2	127	3.83	.63	4	.95	.84	.92	.22	.42
18.	Ind. Contributions – T3	127	3.65	.95	4	.98	.90	.98	.21	.40
19.	Role Differentiation – T1	24	.51	.41	--	--	--	--	--	--
20.	Role Differentiation – T2	24	.90	.58	--	--	--	--	--	--
21.	Role Differentiation – T3	24	.69	.43	--	--	--	--	--	--

**Table 4 (cont'd)**  
**Descriptive Statistics, Scale Reliabilities,  $r_{wg}$ s, and ICCs for Study Variables**

		N	Mean	SD	# Items	$\alpha$	Mean $r_{wg}$	Median $r_{wg}$	ICC(1)	ICC(2)
22.	Role Overlap – T2	127	3.32	.81	1	--	.53	.60	.25	.64
23.	Role Switching – T2	127	2.40	.61	1	--	.50	.54	.08	.32
24.	Role Sharing – T2	127	3.33	.70	1	--	.42	.54	.11	.38
25.	Role Overlap – T3	127	3.27	.81	1	--	.44	.50	.14	.47
26.	Role Switching – T3	127	2.68	.63	1	--	.31	.21	-.04	-.27
27.	Role Sharing – T3	127	3.19	.71	1	--	.40	.45	.05	.21
28.	Satisfaction w/ Team Experience – T1	127	4.23	.91	3	.95	--	--	--	--
29.	Satisfaction w/ Team Experience – T2	126	4.12	.89	3	.93	--	--	--	--
30.	Satisfaction w/ Team Experience – T3	123	4.11	1.10	3	.97	--	--	--	--
31.	Role Conflict – T1	127	2.00	.87	5	.87	--	--	--	--
32.	Role Conflict – T2	126	1.96	.77	5	.85	--	--	--	--
33.	Role Conflict – T3	123	2.17	.96	5	.85	--	--	--	--
34.	Role Ambiguity – T1	127	2.23	.88	5	.92	--	--	--	--
35.	Role Ambiguity – T2	126	2.24	.76	5	.89	--	--	--	--
36.	Role Ambiguity – T3	123	2.15	.90	5	.91	--	--	--	--

## Chapter 5: Results

In the following pages I present the results of my data analyses used to test the three models and related hypotheses developed in this dissertation in Chapter 3. As previously mentioned in the preceding Research Methods chapter (Chapter 4), I will test each model separately. Accordingly, this chapter is divided into four sections. I begin with a presentation of the correlations among study variables, followed by the results from testing each of the three models in order.

### *Intercorrelations Among Study Variables*

Table 5 presents the bivariate correlations among all study variables that reside at the individual level. Only the control variables that were selected for use in the final analytic testing are included in this table. In this table, the control variables are presented first, followed by the four leadership roles at each point in time. Next, the individual contributions dependent variable is presented at all three points in time, since it is relevant in models 1, 2, and 3. Next, I have presented the role-structuring variables at Time 2 and Time 3.<sup>4</sup> Finally, the remaining three dependent variables from model 3 are presented at all three points in time – satisfaction with the team experience, role conflict, and role ambiguity.

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<sup>4</sup> The role structuring variables are most theoretically relevant at Time 2 and Time 3 when there has been adequate opportunity for team members to make adjustments to their leadership roles (as opposed to the initial jockeying that might take place in the first weeks while the team is involved in forming and storming processes (Tuckman, 1965)). In addition, the measure for role overlap and role sharing that was used at Time 1 differs from those at Time 2 and 3 (self-report Likert scales for each). I did run regression analyses using these variables as well, but they resulted in mostly non-significant findings. For all these reasons, the decision was made to drop role sharing and role overlap at Time1 from further consideration.

**Table 5**  
**Intercorrelations Among Study Variables**

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1 Age	--														
2 GPA	-.05	--													
3 Asian	.08	-.06	--												
4 Navigator (T1)	-.17	.12	-.32**	--											
5 Social Integrator (T1)	-.13	.10	-.22*	.73**	--										
6 Liaison (T1)	-.18*	.08	-.26**	.74**	.72**	--									
7 Engineer (T1)	-.17	.16	-.23**	.75**	.79**	.70**	--								
8 Navigator (T2)	-.16	.23*	-.38**	.67**	.55**	.63**	.58**	--							
9 Social Integrator (T2)	-.17	.12	-.25**	.49**	.50**	.50**	.49**	.73**	--						
10 Liaison (T2)	-.19*	-.02	-.34**	.54**	.56**	.69**	.48**	.66**	.62**	--					
11 Engineer (T2)	-.16	.28**	-.26**	.56**	.53**	.54**	.59**	.79**	.72**	.56**	--				
12 Navigator (T3)	-.18*	.28**	-.31**	.63**	.55**	.63**	.60**	.74**	.62**	.50**	.69**	--			
13 Social Integrator (T3)	-.14	.25**	-.18*	.50**	.58**	.60**	.60**	.54**	.56**	.45**	.60**	.77**	--		
14 Liaison (T3)	-.25**	.13	-.27**	.52**	.52**	.71**	.55**	.59**	.61**	.67**	.58**	.70**	.72**	--	
15 Engineer (T3)	-.19*	.25**	-.18*	.54**	.49**	.52**	.59**	.55**	.57**	.38**	.68**	.79**	.80**	.71**	--



**Table 5 (cont'd)**

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
16	Individual Cont. (T1)	-.23*	.15	-.09	.18*	.13	.19*	.25**	.29**	.22*	.19*	.31**	.32**	.25**	.33**	.33**
17	Individual Cont. (T2)	-.22*	.33**	-.37**	.38**	.36**	.31**	.37**	.44**	.31**	.30**	.49**	.50**	.42**	.39**	.44**
18	Individual Cont. (T3)	-.20*	.26**	-.35**	.32**	.24**	.29**	.34**	.39**	.25**	.21*	.34**	.52**	.43**	.31**	.41**
19	Role Overlap (T2)	-.21*	.22*	-.35**	.69**	.60**	.65**	.54**	.73**	.65**	.66**	.61**	.65**	.55**	.58**	.51**
20	Role Switching (T2)	-.13	.06	-.06	.30**	.32**	.27**	.25**	.23**	.08	.25**	.07	.20*	.04	.12	.05
21	Role Sharing (T2)	-.22*	.12	-.26**	.59**	.57**	.56**	.56**	.63**	.62**	.62**	.62**	.62**	.55	.59**	.55**
22	Role Overlap (T3)	-.24*	.25	-.34**	.59**	.57**	.63**	.63**	.65**	.58**	.53**	.63**	.79**	.69**	.69**	.71**
23	Role Switching (T3)	-.13	.14	-.17	.38**	.49**	.49**	.47**	.56**	.50**	.39**	.50**	.65**	.53**	.52**	.56**
24	Role Sharing (T3)	-.18*	.25*	-.31**	.51**	.54**	.61**	.58**	.67**	.61**	.50**	.65**	.74**	.69**	.66**	.66**
25	Satisfaction (T1)	.11	-.02	.01	-.06	.09	.05	.19*	-.01	.04	-.05	.07	.02	.15	.06	.11
26	Satisfaction (T2)	.08	-.01	.00	-.13	-.10	-.10	.06	-.10	.00	-.15	.01	-.10	.06	-.04	.04
27	Satisfaction (T3)	.08	-.06	.12	-.15	-.11	-.08	.07	-.22*	-.10	-.17	-.08	-.16	.07	-.07	.00
28	Role Conflict (T1)	-.15	-.12	.09	-.14	-.18	-.22*	-.27**	.14	-.16	-.14	-.19	-.20*	-.30**	-.24**	-.28**
29	Role Conflict (T2)	.04	.03	.02	-.06	-.04	-.17	-.16	-.07	-.04	-.06	-.05	-.15	-.27**	-.20*	-.16
30	Role Conflict (T3)	-.14	.05	-.09	-.01	.03	-.10	-.09	-.06	-.08	-.08	-.09	-.13	-.27**	-.17	-.20*
31	Role Ambiguity(T1)	.02	-.08	.05	-.05	-.04	-.06	-.08	-.02	.05	.03	-.05	-.03	-.11	-.07	-.03
32	Role Ambiguity(T2)	-.12	.00	-.10	.09	.15	-.05	.05	.02	.00	.08	-.02	-.02	-.07	-.02	.00
33	Role Ambiguity(T3)	-.01	-.03	-.08	.05	-.02	-.05	-.06	-.02	-.01	.06	.01	-.06	-.15	-.06	-.08

**Table 5 (cont'd)**

		16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
16	Individual Cont. (T1)	--														
17	Individual Cont. (T2)	.50**	--													
18	Individual Cont. (T3)	.37**	.65**	--												
19	Role Overlap (T2)	.26**	.62**	.48**	--											
20	Role Switching (T2)	.10	.23**	.07	.32**	--										
21	Role Sharing (T2)	.29**	.47**	.48**	.78**	.19*	--									
22	Role Overlap (T3)	.31**	.57**	.69**	.69**	.23*	.68**	--								
23	Role Switching (T3)	.35**	.38**	.43**	.54**	.25*	.55**	.69**	--							
24	Role Sharing (T3)	.30**	.52**	.57**	.66**	.10	.61**	.84**	.70**	--						
25	Satisfaction(T1)	.07	.15	.22*	-.03	-.03	.00	.15	.13	.10	--					
26	Satisfaction(T2)	.01	.04	.07	-.13	-.30	-.03	.04	-.05	.00	.57**	--				
27	Satisfaction(T3)	.06	.03	.14	-.16	-.26	-.06	.05	-.15	-.02	.46**	.65**	--			
28	Role Conflict (T1)	-.17	-.16	-.22	-.18	.02	-.15	-.24**	-.16	-.25**	-.44**	-.30**	-.28**	--		
29	Role Conflict (T2)	-.17	-.12	-.15	-.13	.15	-.17	-.19	-.15	-.18*	-.30**	-.41**	-.40**	.37**	--	
30	Role Conflict (T3)	-.05	-.04	-.19*	-.09	.19*	-.03	-.22*	-.04	-.19*	-.16	-.29**	-.58**	.46**	.53**	--

**Table 5 (cont'd)**

		16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33
31	Role Ambiguity (T1)	-.07	-.14	-.26**	-.08	.01	-.09	-.15	.03	.00	-.51**	-.35**	-.31**	.33**	.27**	.19*	--		
32	Role Ambiguity (T2)	-.10	-.11	-.03	.06	.10	-.01	-.01	-.02	.00	-.32**	-.56**	-.32**	.18*	.45**	.27**	.37**	--	
33	Role Ambiguity (T3)	-.07	-.17	-.14	.02	.09	.01	-.14	.03	-.05	-.35**	-.42**	-.46**	.27**	.27**	.32**	.45**	.51**	--

N = 127. \* p < .05. \*\* p < .01.

Note: All primary independent variables in the study (four leadership roles (variables 4-15) and three role-structuring variables (19-24)) have been grouped together by time in this correlation matrix above. All dependent variables in the study (contributions (16-18), satisfaction with the team experience (25-27), role conflict (28-30), and role ambiguity (31-33) have been grouped together by variable in this correlation matrix.

### *Results – Model 1 Testing*

The first research question in this dissertation related to whether I could empirically confirm the existence and demonstrate the predictive validity of the four theoretically derived internal team leadership roles (Navigator, Engineer, Social Integrator, and Liaison). Thus, Model 1 involved empirical tests of agreement on these leadership roles, distinction between the roles, and a simple test of the direct relationships between the four roles and individual contributions to the team project.

Hypothesis 1a asserted that these leadership roles would be discernible within teams such that there would be high levels of agreement among team members regarding who in their team had enacted each of the roles. This hypothesis was tested by examining the  $r_{wgs}$  and ICCs for the four roles presented in Table 4. The  $r_{wg}$  statistic can be considered a measure of within-group agreement (James et al., 1984, etc). Since there were multiple raters for each individual's engagement in each of the four leadership roles, a fairly strong  $r_{wg}$  is an indicator that the roles are salient and clear to fellow team members. The mean  $r_{wgs}$  for the four roles across time ranged from .48 to .64, while the median  $r_{wgs}$  for the four roles across time ranged from .50 to .71 (with 8 of the 12 statistics equal to .65). While not as high as the  $r_{wgs}$  sometimes found for team-level constructs (Bliese, 2000; Kozlowski & Hattrup, 1992), these results demonstrate that there is a generally strong level of agreement on the degree to which each individual engages in the four leadership roles with some variance in the role scores. ICC(1) can be considered a measure of inter-rater reliability, or the degree to which raters are substitutable for one another. The ICC(1) scores ranged from .07 to .42, with only one score falling below .10 (Social Integrator at Time 1 was equal to .07). This provides

evidence that there was sufficient reliability across raters in the pattern of their leadership role ratings for individuals. Finally, the ICC(2) statistic can be considered a measure of the stability of the average ratings for an individual on each leadership role (Bliese, 2000). ICC(2) scores ranged from .27 to .80, with only 2 scores falling below .50 (Social Integrator at Time 1 was equal to .27, and Engineer at Time 1 was equal to .41). In general, the pattern of these statistics demonstrated fairly strong levels of agreement and reliability in the ratings of individuals' engagement in the four leadership roles. Therefore, Hypothesis 1 was supported.

Hypothesis 1b suggested that the four leadership roles would be found to be empirically distinct from one another. The zero-order correlations between the four roles were somewhat high, ranging from  $r = .38$  to  $r = .80$  across the three time periods. This is not too surprising given the fact that each of these roles is considered to be an aspect or type of internal team leadership. In order to test this hypothesis, I performed confirmatory factor analyses (CFAs) using EQS to examine whether the data supported my theoretical model, namely that these four roles are related but distinct factors as indicated by individual ratings across time.

I specified a four-factor measurement model with 12 total indicators (the three scores on each leadership role – at T1, T2, and T3 - as indicators of a factor for each of the four leadership roles - Navigator, Engineer, Social Integrator, and Liaison.) I allowed these four factors to covary with one another, and also allowed the error terms for the same time period to covary with one another. This model proved to be a very good fit to the data ( $\chi^2_{(30)} = 69.24$ ; AIC = 9.24; CFI = .976; GFI = .919; AGFI = .789; SRMR = .030; RMSEA = .102), thus providing support for the hypothesized model. I also tested several

alternative models to see if they were perhaps a better fit for the data. First, I tried a one-factor model but it was a poor fit ( $\chi^2_{diff(6)} = 200.23$ ,  $p > .05$ ). Next, I tried a three factor model which allowed the six indicators for the Navigator and Engineer roles to load onto a single factor (since these two roles had the strongest correlations with one another), with the Social Integrator and Liaison roles remaining as separate factors. This model demonstrated improved fit over the one factor model ( $\chi^2_{(33)} = 129.69$ ; AIC = 63.69; CFI = .941; GFI = .860; AGFI = .668; SRMR = .067; RMSEA = .152), but was still significantly worse than the hypothesized model ( $\chi^2_{diff(3)} = 60.45$ ,  $p > .05$ ). Finally, I tried a three-factor model where the factors were T1, T2, and T3, with the four leadership roles as indicators of each time period, and allowed the leadership role error terms to covary with one another. This model was a good fit to the data ( $\chi^2_{(39)} = 93.12$ ; AIC = 15.12; CFI = .967; GFI = .899; AGFI = .797; SRMR = .063; RMSEA = .105), but was again significantly worse than the hypothesized model ( $\chi^2_{diff(9)} = 23.88$ ,  $p > .05$ ).

Therefore, Hypothesis 1b was supported.

Hypothesis 1c argued that these four internal team leadership roles would be important to consider as evidenced by their relationship with individual contributions to the team. An examination of the correlations found in Table 5 shows that all of the relationships between the four leadership roles and individual contributions are positive and significant with one exception (Social Integrator at T1), and that the magnitude of the significant correlations ranged between  $r = .18$  and  $r = .52$ . Therefore, overall, Hypothesis 1c was supported.

### *Results – Model 2 Testing*

Having found evidence of the existence of these four internal team leadership roles and their important positive relationship with individual contributions to the team, the second research question in this dissertation sought to examine two potential moderators of the relationship between engagement in these leadership roles and individual contributions. In Model 2, the first potential moderator was Time, which was used to develop Hypotheses 2a – 2d. The second potential moderator was team-level role differentiation as specified in Hypothesis 3.

With hypotheses 2a – 2d I sought to predict the points in time which each of the four internal team leadership roles would be perceived as most important by team members. In order to test these assertions, I ran regression analyses at each of the three points in time for each of the four roles. Tables 7a-d below present the results of these regression analyses.

In order to test the specific predictions in these hypotheses (i.e., the specific across-time trends), I also ran 3-level HLM analyses which allow for the simultaneous modeling of within-person, between-person, and team level variance in order to account for the nested nature of the data. I began by running a fully unconditional (null) model with contributions at the within-person level as the dependent variable. This model yielded ICC(1) of .29 at Level 1 and .29 at Level 2, revealing that there was meaningful between-person and group level variance to be explained in this dependent variable. Based on these values, I concluded that HLM was appropriate to examine variance in individual contributions across time that could potentially be explained by team leadership roles. I then proceeded to test Hypothesis 3 by simultaneously modeling

within-person and between-person predictors of individual contributions across time within teams.

Each of the four internal team leadership roles was predicted to be more strongly related to individual contributions at a specific point(s) in time. In order to test these specific predictions, I created a pair of orthogonal contrast codes for each leadership role, the first of which specifically contrasted the predictions for that leadership role (the second was required in order to exhaust the information about group membership but was not considered a planned comparison). Table 6 below presents the contrast codes that were used for each prediction. I also created an interaction term at Level 1 between the leadership role and the predicted effect code by taking the product of these two variables.

At Level 1 of the HLM analysis I entered the leadership role being tested, the two orthogonal contrast codes for that role, and the product term between that role and its predicted effect. I chose to group-mean center all of these variables because I was interested in considering how time, the specific leadership role, and the interaction between the two varied in its ability to predict individual contributions across time. The model would only allow me to include 1 random effect at Level 2 due to limited degrees of freedom, so I chose to include the random effect for the interaction term which was the correct coefficient to test Hypotheses 2a-d. All other Level 1 variables had fixed effects at Level 2. At Level 2 of the HLM analysis I also entered the three individual control variables in this study - age, GPA, and Asian status. I chose to grand-mean center these variables and to fix their effects at Level 2 in order to hold them constant across all teams (since I am not specifically interested in the effects of these variables within groups.) I



present the specific results of the test of significance for the coefficient of the interaction term for each role below as I discuss that specific hypothesis.

**Table 6 – Contrast Codes**

	Time 1 effect (Navigator)	Time 1 contrast	Time 3 effect (Engineer)	Time 3 contrast	Time 2 effect (S. I. and Liaison)	Time 2 contrast
Time 1	1	0	-1/2	1	-1/2	1
Time 2	-1/2	-1	-1/2	-1	1	0
Time 3	-1/2	1	1	0	-1/2	-1

Hypothesis 2a predicted that the Navigator role would have a stronger relationship with individual contributions at T1 than at T2 and T3. Table 7a below shows a pattern that appears opposite to this prediction. Engagement in the Navigator role at Time 1 was not significantly related to individual contributions at Time 1, but showed a relationship with contributions at Time 2 ( $\beta = .23$ ,  $p < .01$ ) and at Time 3 ( $\beta = .17$ ,  $p < .05$ ). At Time 2, engagement in the Navigator role appears to become more important, predicting contributions at both Time 2 ( $\beta = .27$ ,  $p < .01$ ) and Time 3 ( $\beta = .23$ ,  $p < .05$ ). Finally, at Time 3, the Navigator role was the strongest predictor of individual contributions ( $\beta = .39$ ,  $p < .01$ ), explaining 13% of the variance in contributions above and beyond the control variables. In order to provide a test of whether the Navigator role's relationship with individual contributions was significantly stronger at Time 1 than at Times 2 and 3, I examined the significance and direction of the HLM coefficient for the interaction between Navigator and effect code 1. This coefficient was negative and significant ( $\gamma = -.11$ ,  $t(124) = -2.78$ ,  $p < .01$ ), indicating that the Navigator role in fact had a significantly weaker relationship with individual contributions at Time 1 versus Time 2 and 3. Therefore, Hypothesis 2a was not supported.

**Table 7a**  
**Regression of Individual Contributions on the Navigator Role Across Time**

Variable	Individual Contributions – Time 1	Individual Contributions – Time 2	Individual Contributions – Time 3
Step 1			
Age	-.22*	-.17*	-.16*
GPA	.13	.30**	.23**
Asian	-.07	-.34**	-.31**
R <sup>2</sup>	.08*	.26**	.20**
Step 2			
Navigator – Time 1	.12	.23**	.17*
R <sup>2</sup>	.09	.31**	.23*
ΔR <sup>2</sup>	.01	.05**	.03**
Step 2			
Navigator – Time 2		.27**	.23*
R <sup>2</sup>		.32**	.24*
ΔR <sup>2</sup>		.06**	.04*
Step 2			
Navigator – Time 3			.39**
R <sup>2</sup>			.33**
ΔR <sup>2</sup>			.13**

N = 127. \* p < .05. \*\* p < .01.

Hypothesis 2b predicted that the Engineer role would have a stronger relationship with individual contributions at T1 and T2 than at T3. Table 7b below shows that the strongest relationship with contributions appears to be at Time 2. Engagement in the Engineer role at Time 1 was significantly related to individual contributions at Time 1 ( $\beta = .20, p < .05$ ), Time 2 ( $\beta = .23, p < .01$ ) and at Time 3 ( $\beta = .21, p < .05$ ). At Time 2, engagement in the Engineer role appears to become a stronger predictor of contributions at Time 2 ( $\beta = .34, p < .01$ ), explaining 10% of the variance in contributions above and beyond the control variables, and is a significant predictor of contributions at Time 3 as well ( $\beta = .19, p < .05$ ). Finally, at Time 3, the Engineer role remained significantly

related to individual contributions ( $\beta = .29, p < .01$ ), explaining 7% of the variance in contributions above and beyond the control variables. In order to provide a test of whether the Engineer role's relationship with individual contributions was significantly stronger at Times 1 and 2 than at Time 3 as predicted, I examined the significance and direction of the HLM coefficient for the interaction between Engineer and effect code 3. This coefficient was negative but not significant ( $\gamma = -.02, t(124) = -.32, ns$ ), indicating that the Engineer role did not have a significantly stronger relationship with individual contributions at Time 1 and 2 versus Time 3. Therefore, Hypothesis 2b was not supported.

**Table 7b**  
**Regression of Individual Contributions on the Engineer Role Across Time**

Variable	Individual Contributions – Time 1	Individual Contributions – Time 2	Individual Contributions – Time 3
Step 1			
Age	-.22*	-.17*	-.16*
GPA	.13	.30**	.23**
Asian	-.07	-.34**	-.31**
R <sup>2</sup>	.08*	.26**	.20**
Step 2			
Engineer – Time 1	.20*	.23**	.21*
R <sup>2</sup>	.11*	.31**	.24*
$\Delta R^2$	.03*	.05**	.04*
Step 2			
Engineer – Time 2		.34**	.19*
R <sup>2</sup>		.36**	.23*
$\Delta R^2$		.10**	.03*
Step 2			
Engineer – Time 3			.29**
R <sup>2</sup>			.27**
$\Delta R^2$			.07**

N = 127. \*  $p < .05$ . \*\*  $p < .01$ .

**Table 7c**  
**Regression of Individual Contributions on the Social Integrator Role Across Time**

Variable	Individual Contributions – Time 1	Individual Contributions – Time 2	Individual Contributions – Time 3
Step 1			
Age	-.22*	-.17*	-.16*
GPA	.13	.30**	.23**
Asian	-.07	-.34**	-.31**
R <sup>2</sup>	.08*	.26**	.20**
Step 2			
Social Integrator – Time 1	.08	.24**	.13
R <sup>2</sup>	.08	.32**	.22
ΔR <sup>2</sup>	.00	.06**	.02
Step 2			
Social Integrator – Time 2		.17*	.11
R <sup>2</sup>		.29*	.21
ΔR <sup>2</sup>		.03*	.01
Step 2			
Social Integrator – Time 3			.31**
R <sup>2</sup>			.29**
ΔR <sup>2</sup>			.09**

N = 127. \* p < .05. \*\* p < .01.

Hypothesis 2c predicted that the Social Integrator role would have a stronger relationship with individual contributions at T2 than at T1 and T3. Table 7c above shows a pattern that appears somewhat consistent with this prediction. Engagement in the Social Integrator role at Time 1 was not significantly related to individual contributions at Time 1 or at Time 3, but showed a strong relationship with contributions at Time 2 ( $\beta = .24, p < .01$ ), explaining 6% of the variance in individual contributions above and beyond the effects of control variables. At Time 2, engagement in the Social Integrator role predicted contributions at Time 2 ( $\beta = .17, p < .05$ ), but not at Time 3. However, at Time 3, the Social Integrator role was the strongest predictor of individual contributions ( $\beta =$

.31,  $p < .01$ ), explaining 9% of the variance in contributions above and beyond the control variables. In order to provide a test of whether the Social Integrator role's relationship with individual contributions was significantly stronger at Time 2 than at Times 1 and 3, I examined the significance and direction of the HLM coefficient for the interaction between Social Integrator and effect code 2. This coefficient was not significant ( $\gamma = .00$ ,  $t(124) = -.11$ , ns), indicating that the Social Integrator role did not have a significantly stronger relationship with individual contributions at Time 2 versus Time 1 and 3. Therefore, Hypothesis 2c was not supported.

Hypothesis 2d predicted that the Liaison role would have a consistent relationship with individual contributions across all three points in time. Table 7d below shows a pattern that appears somewhat consistent with this prediction. Engagement in the Liaison role was surprisingly not a significant predictor of individual contributions at Time 1 or Time 3. Engagement in the Liaison role at Time 1 predicted contributions at Time 2 ( $\beta = .17$ ,  $p < .05$ ), as did engagement in the Liaison role at Time 2 ( $\beta = .17$ ,  $p < .05$ ), explaining 3% of the variance in contributions at each time. In order to provide a test of whether the Liaison role's relationship with individual contributions was not significantly different across time, I examined the significance and direction of the HLM coefficient for the interaction between Liaison and effect code 2 (since Time 2 was the only point at which the regression results yielded a positive effect.) This coefficient was not significant ( $\gamma = .04$ ,  $t(124) = .94$ , ns), indicating that the Liaison role did not have a significantly stronger relationship with individual contributions at Time 2 versus Time 1 and 3. Thus, while the relationships did not differ significantly across time, the lack of a significant relationship at Times 1 and 3 meant there was little support for Hypothesis 2d.

**Table 7d**  
**Regression of Individual Contributions on the Liaison Role Across Time**

Variable	Individual Contributions – Time 1	Individual Contributions – Time 2	Individual Contributions – Time 3
Step 1			
Age	-.22*	-.17*	-.16*
GPA	.13	.30**	.23**
Asian	-.07	-.34**	-.31**
R <sup>2</sup>	.08*	.26**	.20**
Step 2			
Liaison – Time 1	.14	.17*	.16
R <sup>2</sup>	.09	.29*	.22
ΔR <sup>2</sup>	.02	.03*	.02
Step 2			
Liaison – Time 2		.17*	.08
R <sup>2</sup>		.29*	.21
ΔR <sup>2</sup>		.03*	.01
Step 2			
Liaison – Time 3			.16
R <sup>2</sup>			.22
ΔR <sup>2</sup>			.02

N = 127. \* p < .05. \*\* p < .01.

Hypothesis 3 asserted that, in addition to Time, the degree of role differentiation at the team level would moderate the relationship between the four internal team leadership roles and individual contributions. Specifically, role differentiation was argued to strengthen the existing relationships between the leadership roles and individual contributions. Since the moderator here is at the team level of analysis rather than the individual level, it is necessary to employ hierarchical linear modeling (HLM) techniques to test for this cross-level moderation.

In order to assess whether HLM techniques were appropriate, I first ran three different null models for the three dependent variables (individual contributions at Time

1, Time 2, and Time 3). Based on these models, I calculated ICC(1) values for each dependent variable in order to assess the degree of between-group variance. The results indicated that a fairly high percentage of the variance in these three variables resided between groups. For individual contributions at Time 1,  $ICC(1) = .45$ ; at Time 2,  $ICC(1) = .26$ ; at Time 3,  $ICC(1) = .37$ . Based on these values, I concluded that HLM was indeed appropriate since there appeared to be meaningful between team variance in individual contributions that could potentially be explained by team role differentiation.

I then proceeded to test Hypothesis 3 by using HLM to simultaneously model both individual (internal team leadership roles) and team-level (role differentiation) predictors of individual contributions at each of the three points in time. For all analyses, I began by entering the three control variables (age, GPA, and Asian status) at Level 1 using grand mean centering and fixed effects at Level 2. I then entered the leadership roles, one at a time, at Level 1 using group mean centering and random effects at Level 2. Finally, I entered the role differentiation variable at Level 2, uncentered, as a random effect. I first ran this same basic model for each of the four leadership roles and role differentiation at Time 1 predicting contributions at Time 1 (4 separate analyses). Next, I ran the same basic model for each of the four leadership roles and role differentiation at Time 1 and at Time 2 predicting contributions at Time 2 (8 separate analyses). Finally, I ran the same basic model for each of the four leadership roles and role differentiation at Times 1, 2, and 3 predicting contributions at Time 3 (12 separate analyses). Table 8a below presents a summary of the findings for all 24 analyses that were run.

**Table 8a**  
**Summary of HLM Results for Hypothesis 3**

	<b>1</b>	<b>T1 Contributions</b>	<b>2</b>	<b>3</b>
	<b>Main Effect</b>		<b>Main Effect</b>	<b>Moderation Effect</b>
Navigator - T1	+	Role Diff. – T1	ns	ns
Engineer – T1	+	Role Diff. – T1	ns	ns
Soc. Integrator – T1	ns	Role Diff. – T1	ns	ns
Liaison – T1	ns	Role Diff. – T1	ns	ns

		<b>T2 Contributions</b>		
	<b>Main Effect</b>		<b>Main Effect</b>	<b>Moderation Effect</b>
Navigator – T2	+	Role Diff. – T2	ns	ns
Engineer – T2	+	Role Diff. – T2	ns	ns
Soc. Integrator – T2	ns	Role Diff. – T2	ns	ns
Liaison – T2	ns	Role Diff. – T2	ns	ns
Navigator - T1	+	Role Diff. – T1	ns	ns
Engineer – T1	ns	Role Diff. – T1	ns	ns
Soc. Integrator – T1	+	Role Diff. – T1	ns	ns
Liaison – T1	ns	Role Diff. – T1	ns	+

		<b>T3 Contributions</b>		
	<b>Main Effect</b>		<b>Main Effect</b>	<b>Moderation Effect</b>
Navigator – T3	+	Role Diff. – T3	-	-
Engineer – T3	+	Role Diff. – T3	-	ns
Soc. Integrator – T3	+	Role Diff. – T3	-	ns
Liaison – T3	ns	Role Diff. – T3	-	ns
Navigator – T2	+	Role Diff. – T2	ns	-
Engineer – T2	+	Role Diff. – T2	ns	-
Soc. Integrator – T2	+	Role Diff. – T2	ns	ns
Liaison – T2	ns	Role Diff. – T2	ns	ns
Navigator - T1	+	Role Diff. – T1	-	-
Engineer – T1	ns	Role Diff. – T1	-	ns
Soc. Integrator – T1	+	Role Diff. – T1	-	ns
Liaison – T1	+	Role Diff. – T1	-	ns

+ Test of coefficient was positive,  $p < .05$ .

- Test of coefficient was negative,  $p < .05$ .

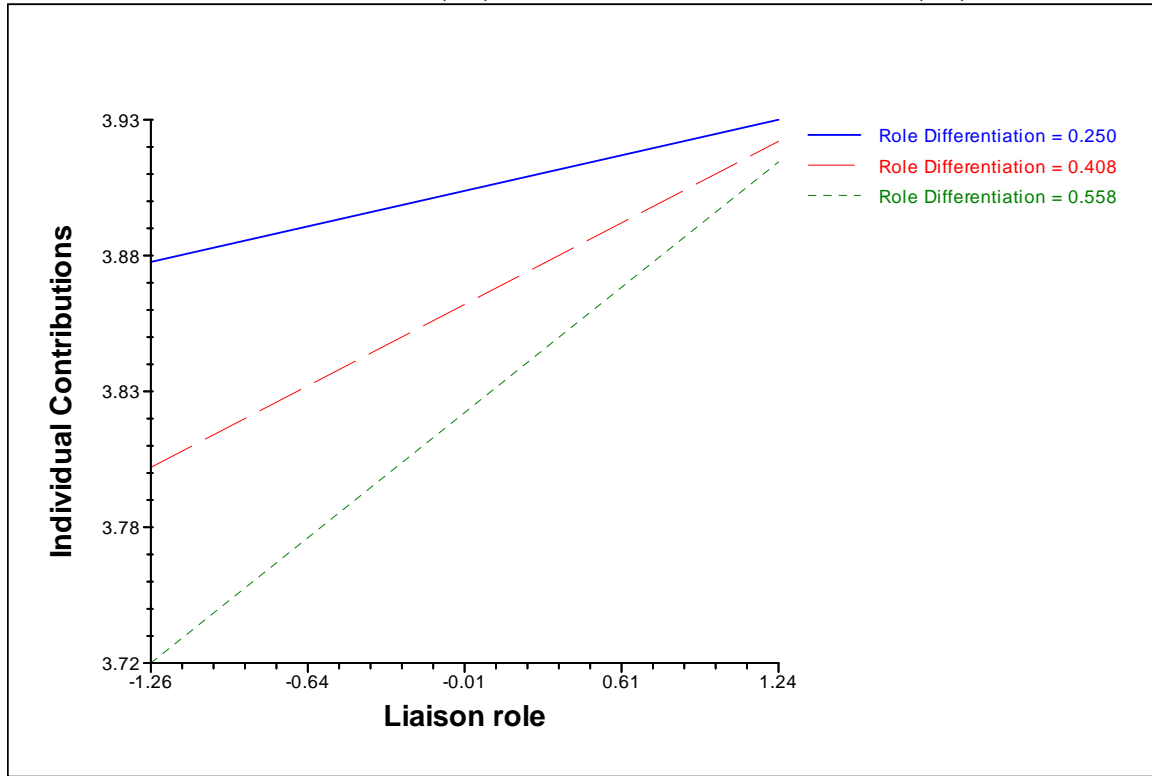
ns Test of coefficient was not significant at the .05 level.



Column 1 of Table 8a shows the pattern of results for the main effect of leadership roles on individual contributions across time. The pattern of these findings is very similar to the pattern of findings for the regression analyses in Tables 7a-d above as would be expected. Column 2 of Table 8a shows the pattern of results for the team-level role differentiation variable predicting the intercept, which can be interpreted as the main effect of role differentiation on contributions. These main effects for role differentiation were not significant at Time 1 and Time 2. However, role differentiation at Times 1 and 3 was found to have a negative main effect on contributions at Time 3. This suggests that teams with a less clearly differentiated leadership role structure at the beginning and end of their projects demonstrated higher average levels of individual contributions at the end of the project. Column 3 of Table 8a represents the significance test for Hypothesis 3, where role differentiation acts as a cross-level moderator of the relationship between leadership roles and individual contributions. As can be seen, most of the potential moderation relationships of role differentiation at Times 1 and 2 were not significant.

In examining the results in column 3 of Table 8a, there is only 1 coefficient that is significant and positive, which is what I would expect to find in order to support Hypothesis 3. Role differentiation at Time 1 strengthens the relationship between engagement in the Liaison role at Time 1 and individual contributions at Time 2. A graph of this relationship is presented below in Figure 5 and shows that the slope of the line predicting the Liaison role's effect on individual contributions becomes more positive for higher levels of team role differentiation (the three lines represent the slopes for the 25<sup>th</sup>, 50<sup>th</sup>, and 75<sup>th</sup> percentiles.) However, since only 1 of the 24 interaction terms was both significant and positive, Hypothesis 3 was not supported.

**Figure 5**  
**Role Differentiation as Moderator of the Relationship Between**  
**The Liaison Role (T1) and Individual Contributions (T2)**

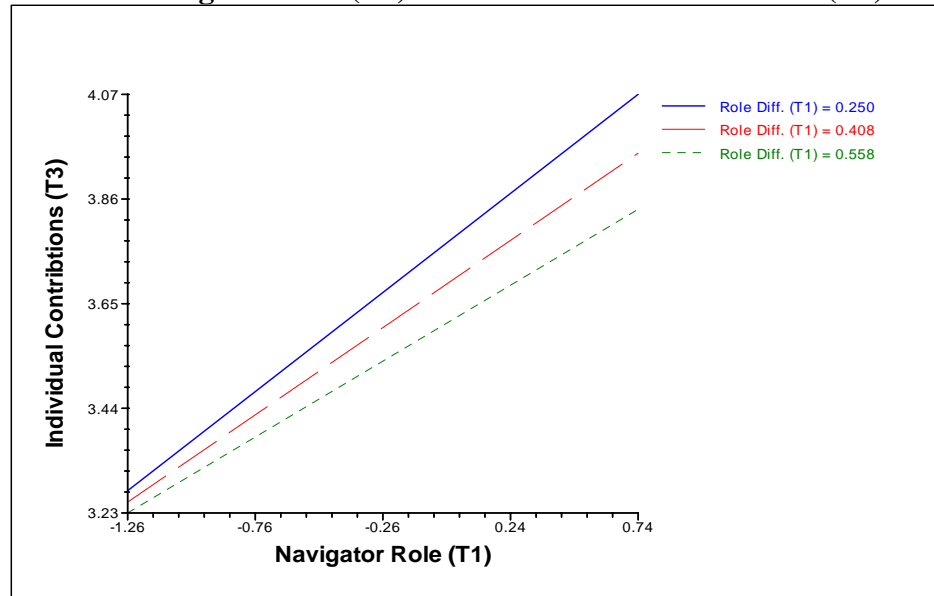


However, it is important to note that there were four significant negative interactions in column 3 of Table 7a. All of the six coefficients for cross-level moderation of team role differentiation were negative for the relationship between the Navigator role and the Engineer role and contributions at Time 3, and four of these six were statistically significant. Table 7b below presents the detailed HLM results for the six models of the Navigator and Engineer roles and team role differentiation (both at all three points in time) predicting individual contributions at Time 3. Figures 6a-d below show the patterns of the significant interactions, with the three lines representing the slopes for the 25<sup>th</sup>, 50<sup>th</sup>, and 75<sup>th</sup> percentiles of the role differentiation measure.

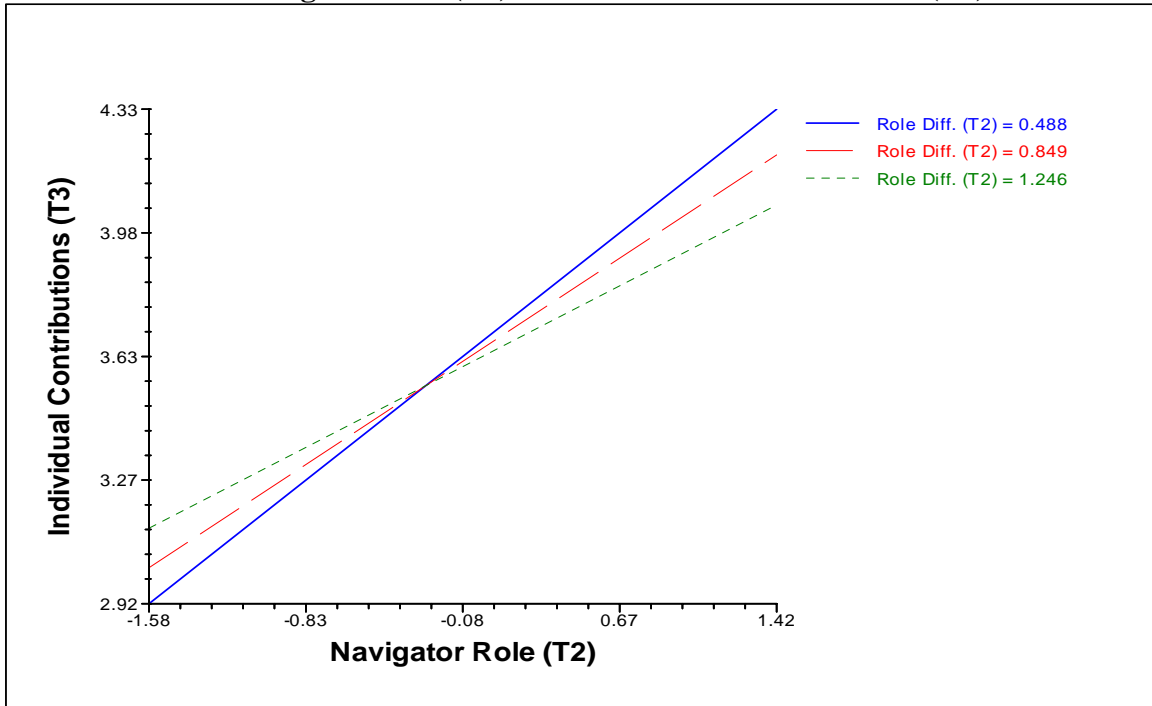
**Table 8b**  
**HLM Results for Navigator and Engineer Roles**  
**Predicting Individual Contributions at Time 3**

Variable	$\gamma$	t	Variable	$\gamma$	t	Variable	$\gamma$	t
<u>Fixed Effects</u>			<u>Fixed Effects</u>			<u>Fixed Effects</u>		
Intercept	3.90	25.68**	Intercept	3.69	16.81**	Intercept	4.02	17.73**
Age	-.03	-1.44	Age	-.02	-.92	Age	-.03	-1.34
GPA	.78	2.76**	GPA	.49	1.88†	GPA	.32	1.20
Asian	-.33	-2.73**	Asian	-.30	-2.70**	Asian	-.18	-1.54
<i>Navigator(T1)</i>	.47	3.35**	<i>Navigator(T2)</i>	.57	3.38**	<i>Navigator(T3)</i>	.77	5.87**
Role Diff. (T1)	-.52	-3.33**	Role Diff. (T2)	-.05	-.27	Role Diff. (T3)	-.56	-2.22*
<u>Slope</u>			<u>Slope</u>			<u>Slope</u>		
Role Diff. (T1)	-.30	-2.27*	Role Diff. (T2)	-.21	-2.16*	Role Diff. (T3)	-.33	-2.84**
<u>Fixed Effects</u>			<u>Fixed Effects</u>			<u>Fixed Effects</u>		
Intercept	3.90	25.64**	Intercept	3.68	17.14**	Intercept	4.01	18.65**
Age	-.04	-1.67†	Age	-.03	-1.51	Age	-.03	-1.36
GPA	.73	2.77**	GPA	.45	1.71†	GPA	.50	1.84†
Asian	-.41	-3.39**	Asian	-.40	-3.80**	Asian	-.39	-3.03**
<i>Engineer (T1)</i>	.47	1.79†	<i>Engineer (T2)</i>	.65	4.91**	<i>Engineer (T3)</i>	.38	2.63*
Role Diff. (T1)	-.51	-3.21**	Role Diff. (T2)	-.05	-.26	Role Diff. (T3)	-.54	-2.35*
<u>Slope</u>			<u>Slope</u>			<u>Slope</u>		
Role Diff. (T1)	-.34	-1.63	Role Diff. (T2)	-.24	-3.19**	Role Diff. (T3)	-.07	-.42

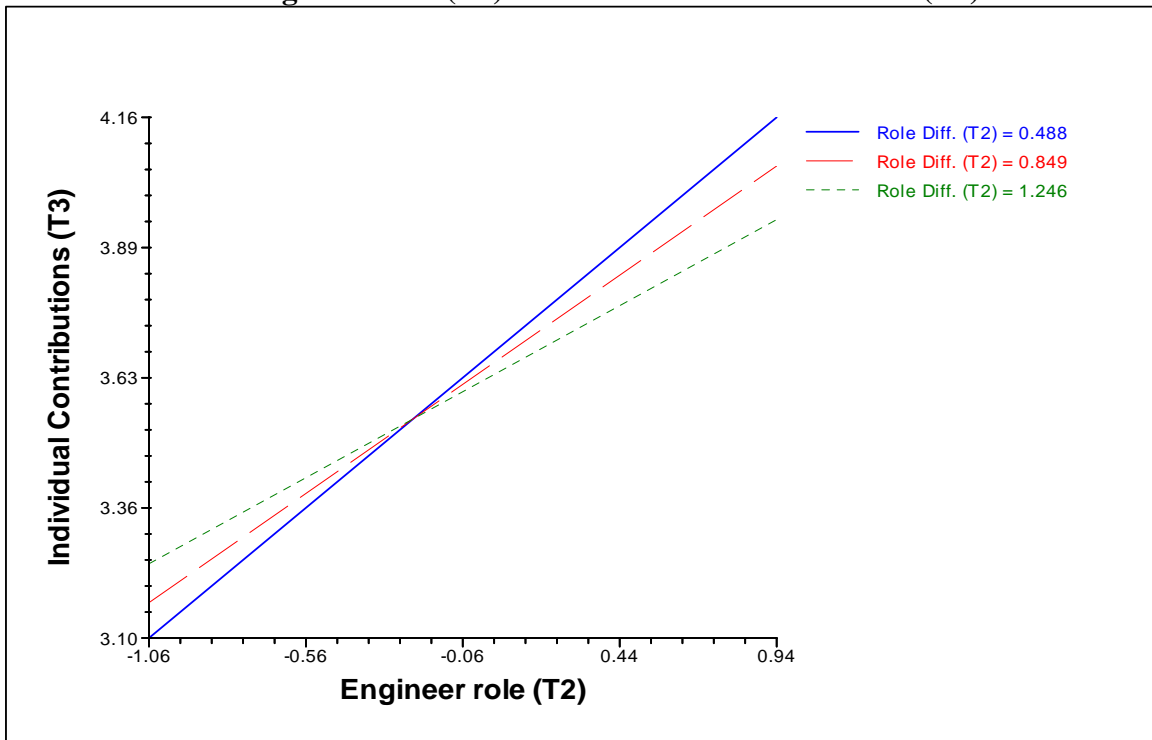
**Figure 6a**  
**Role Differentiation as Moderator of the Relationship Between**  
**The Navigator Role (T1) and Individual Contributions (T3)**



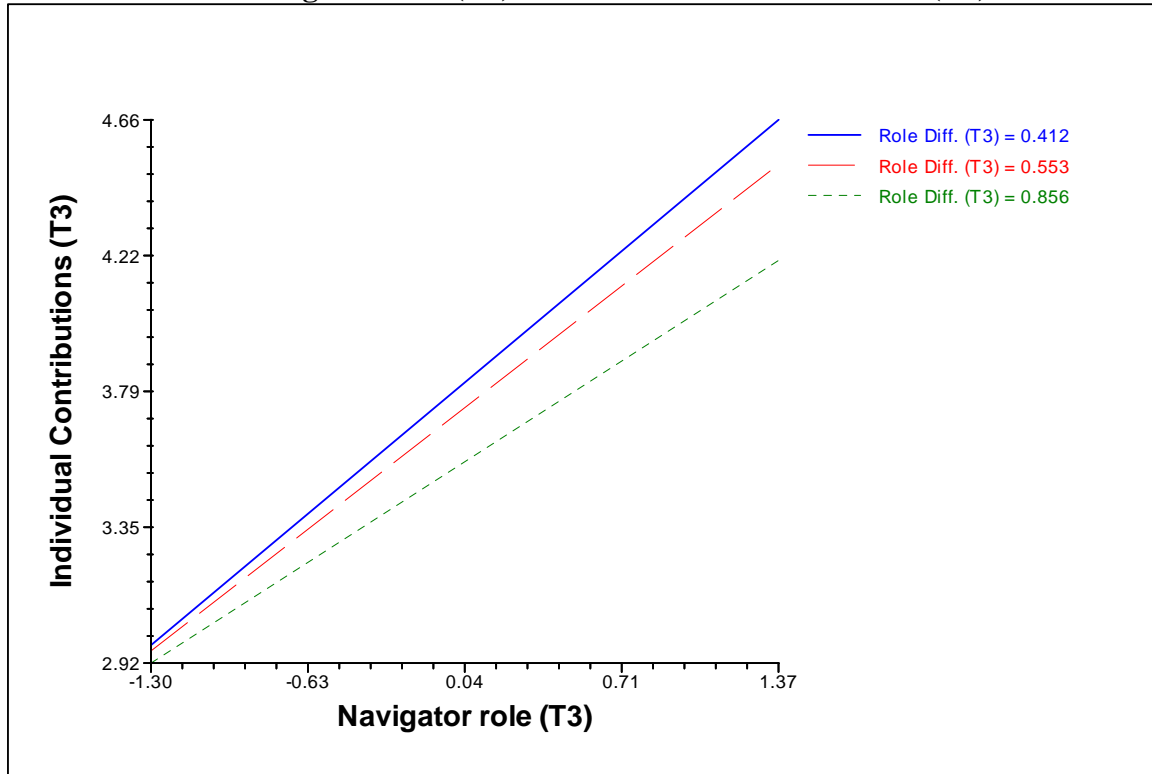
**Figure 6b**  
**Role Differentiation as Moderator of the Relationship Between**  
**The Navigator Role (T2) and Individual Contributions (T3)**



**Figure 6c**  
**Role Differentiation as Moderator of the Relationship between**  
**The Engineer Role (T2) and Individual Contributions (T3)**



**Figure 6d**  
**Role Differentiation as Moderator of the Relationship between**  
**The Navigator Role (T3) and Individual Contributions (T3)**



The negative coefficient for the moderation effects in Table 7a, along with all of the interaction figures above, demonstrate a general pattern that emerged from the data. For teams that had a lower degree of role differentiation, the Navigator and Engineer roles displayed a significantly stronger positive relationship with individual contributions. Conversely, for teams with greater differentiation of leadership roles, the Navigator and Engineer roles were still positively associated with individual contributions at Time 3, but the relationship was significantly weaker by comparison. I also examined the sign of the coefficient for the moderation effect of all 24 models that were run in Table 7a, and only 6 of them were positive. Interestingly, these general findings for a negative moderation effect were the opposite of my predictions.

### *Results – Model 3 Testing*

The third research question in this dissertation sought to examine the effects of how individuals structured their overall engagement in internal team leadership roles in relation to other members. Three distinct structuring practices were examined. The first was role overlap, which is defined as engagement in more than one internal leadership role by a single team member at a single point in time. The second was role switching, which is defined as engagement in two or more different internal team leadership roles by a single team member during at least two different points in time. The third was role sharing, which is a between-member role-structuring process where two or more different team members engage in a single team leadership role at the same point in time.

Hypotheses 4 - 6 predicted how each of these three role-structuring variables would be related to important individual outcomes, namely contributions to the team, satisfaction with the team experience, role conflict, and role ambiguity. In order to test these assertions, I ran regression analyses at Time 2 and Time 3 for the effect of all three role-structuring variables (overlap, switching, and sharing) on each of the four dependent variables (contributions, satisfaction, role conflict, and role ambiguity). Table 9 below presents the results of these regression analyses.

Hypothesis 4a predicted that role overlap would be a positive predictor of individual contributions. Role overlap at Time 2 was a very strong positive predictor of contributions at Time 2 ( $\beta = .47, p < .01$ ), explaining 20% of the variance above and beyond the control variables, though it was not significant at Time 3. Role overlap at Time 3 was again a very strong predictor of contributions at Time 3 ( $\beta = .65, p < .01$ ), helping to explain 29% of the variance in contributions above and beyond the control variables. Therefore, Hypothesis 4a received strong support.

**Table 9**  
**Regression of Role-structuring Variables on Individual Outcomes**  
**Time 2**

Variable	Individual Contributions	Satisfaction with the Team Experience	Role Conflict	Role Ambiguity
<b>Step 1</b>				
Age	-.17*	-.08	.04	-.11
GPA	.30**	.00	.03	-.01
Asian	-.34**	-.02	.03	-.09
R <sup>2</sup>	.26**	.01	.01	.02
<b>Step 2</b>				
Role Overlap – T2	.47**	-.18	-.13	.09
Role Switching – T2	.04	-.28**	.22*	.08
Role Sharing – T2	.01	.16	-.13	-.14
R <sup>2</sup>	.46**	.11**	.08*	.04
ΔR <sup>2</sup>	.20**	.10**	.07*	.02

**Time 3**

Variable	Individual Contributions	Satisfaction with the Team Experience	Role Conflict	Role Ambiguity
<b>Step 1</b>				
Age	-.16*	.07	-.13	-.01
GPA	.23**	-.05	.04	-.04
Asian	-.31**	.10	-.06	-.07
R <sup>2</sup>	.20**	.02	.02	.01
<b>Step 2</b>				
Role Overlap – T2	.15	-.16	-.35*	-.02
Role Switching – T2	-.07	-.24*	.26**	.11
Role Sharing – T2	.28*	.16	.10	-.03
R <sup>2</sup>	.34**	.09*	.11*	.02
ΔR <sup>2</sup>	.14**	.07*	.09*	.01
<b>Step 2</b>				
Role Overlap – T3	.65**	.44*	-.42*	-.48**
Role Switching – T3	-.06	-.39**	.31*	.25†
Role Sharing – T3	-.01	-.01	-.19	.11
R <sup>2</sup>	.49**	.12**	.17**	.09*
ΔR <sup>2</sup>	.29**	.10**	.14**	.08*

N = 127. † p < .10 \* p < .05. \*\* p < .01.

Hypothesis 4b predicted that individuals with overlapping roles would also experience role conflict at a significantly higher rate. Role overlap was not a significant predictor of role conflict at Time 2. However, at Time 3 both role overlap at Time 2 ( $\beta = -.35, p < .05$ ) and role overlap at Time 3 ( $\beta = -.42, p < .05$ ) showed significant negative relationships with role conflict. This finding was significant, but in the opposite direction of my prediction, therefore Hypothesis 4b was not supported.

Hypothesis 5a predicted that switching roles across time would be a positive predictor of individual contributions to the team. The results of the regression analyses in Table 8 show that role switching was not a significant predictor of individual contributions at Time 2 or Time 3. Therefore, Hypothesis 5a was not supported.

Hypothesis 5b predicted that individuals who switch roles across time would experience high levels of role conflict. Role switching at Time 2 was a significant positive predictor of role conflict at Time 2 ( $\beta = .22, p < .05$ ) and Time 3 ( $\beta = .26, p < .01$ ). Role switching at Time 3 was also a significant positive predictor of role conflict at Time 3 ( $\beta = .31, p < .05$ ). Therefore, Hypothesis 5b received strong support.

Hypothesis 5c predicted that individuals who switch roles across time would also experience greater role ambiguity. Role switching at Time 2 was not found to be a significant predictor of role ambiguity at Time 2 or Time 3, although both coefficients were positive. Role switching at Time 3 was only moderately related to role ambiguity ( $\beta = .25, p < .10$ ). Therefore, Hypothesis 5c received only weak support.

Although not hypothesized, it is important to note that role switching was consistently a significant negative predictor of satisfaction with the team experience. In fact, it was the only role-structuring variable found to have a significant relationship with



the satisfaction DV in all three regression models, helping to explain between 7 and 10% of the variance in this outcome above and beyond the control variables. Role switching at Time 2 was a negative predictor of satisfaction at Time 2 ( $\beta = -.28, p < .01$ ) and at Time 3 ( $\beta = -.24, p < .05$ ). Role switching at Time 3 was also a negative predictor of satisfaction at Time 3 ( $\beta = -.39, p < .01$ ).

Hypothesis 6a predicted that role sharing would result in significantly lower levels of satisfaction with the team experience. The results of the regression analyses in Table 8 show that role sharing was not a significant predictor of satisfaction with the team experience at Time 2 or Time 3. Therefore, Hypothesis 6a was not supported.

Hypothesis 6b predicted that individuals who shared leadership roles with other team members would experience role ambiguity at a significantly higher rate. The results of the regression analyses in Table 8 show that role sharing was not a significant predictor of role ambiguity at Time 2 or Time 3. Therefore, Hypothesis 6b was not supported.

The only significant relationship for the role sharing variable was found at Time 2, where role sharing was a positive predictor of individual contributions at Time 2 ( $\beta = .28, p < .05$ ). However, it is important to note that the zero-order correlation between role sharing at Time 2 and role overlap at Time 2 was very high ( $r = .78, p > .01$ ), as was their correlation at Time 3 ( $r = .84, p > .01$ ). Therefore, the pattern of their results for the contributions dependent variable (as well as the other dependent variables for that matter) is likely a multicollinearity effect. Thus, it is likely that role sharing at Time 2 simply consumed slightly more of the variance in individual contributions at Time 3, rendering

role overlap a non-significant result at this point in Time despite its strong predictions of contributions in all other analyses.

**Table 10**  
**Summary of Dissertation Findings**

<b>Model 1</b>		
H1a	High levels of agreement regarding four leadership roles	<b>Supported</b>
H1b	Roles are conceptually distinct from one another	<b>Supported</b>
H1c	Roles are positively related to individual contributions	<b>Supported</b>
<b>Model 2</b>		
H2a	Navigator role more strongly related to contributions at T1 vs. T2 and T3	Not supported – Sig. weaker at T1 vs. T2 and T3
H2b	Engineer role more strongly related to contributions at T1 and T2 vs. T3	Not supported
H2c	Soc. Integrator role more strongly related to contributions at T2 vs. T1 and T3	Not supported
H2d	Liaison role will show no difference in positive relationship with contributions across time	Little support – No sig. difference, but only sig. at T2
H3	Team role differentiation will strengthen the positive relationships between leadership roles and contributions	Generally not supported – However, sig. negative interactions at T3
<b>Model 3</b>		
H4a	Role overlap positively related to contributions	<b>Strong support</b>
H4b	Role overlap positively related to role conflict	Not supported – Sig. negative relationship
H5a	Role switching positively related to contributions	Not supported
H5b	Role switching positively related to role conflict	<b>Strong support</b>
H5c	Role switching positively related to role ambiguity	Weak support
H6a	Role sharing negatively related to satisfaction	Not supported
H6b	Role sharing positively related to role ambiguity	Not supported

Unhypothesized : Role switching was consistently negatively related to satisfaction with the team experience

## **Chapter 6: Discussion**

This dissertation examined the existence of four internal team leadership roles and how they impact the team members who engage in these internal leadership roles. Building on previous research on external team leadership, role theory, and organizational role stress, I sought to develop and validate a concise set of leadership roles that could potentially be exercised by any member of a team. The overall purpose of this dissertation was to begin considering the individual dynamics involved with internal forms of leadership in teams. I sought to integrate previous literature on internal and shared forms of leadership (e.g., Pearce & Conger, 2003; Pearce & Sims, 2002; Zaccaro & Marks, 1999), which have begun to consider leadership in teams other than by a formally designated external team leader. By using roles as a lens (e.g., Katz & Kahn, 1978), I hoped to better understand different ways that team members might participate in the leadership of their team, and also to take an initial look at how their participation might affect them as individuals both positively and negatively.

I developed three separate models designed to empirically test specific hypotheses about the nature of four theoretically derived internal team leadership roles. The first model addressed the validity of the four leadership roles, specifically their ability to be recognized and agreed on by fellow team members, their distinction from one another, and their predictive validity. The second model addressed two potential moderators of the relationship between these four internal team leadership roles and individual contributions to the team, namely time and the degree of differentiation among these roles at the team level. The third model sought to examine the outcomes, both benefits

and costs, of different ways in which individual team members structure their engagement in these four leadership roles.

I used data which were collected from a sample of 127 MBA students nested in 24 consulting teams across three points in time – once each at the beginning, middle, and end of their project life cycle. Hypotheses related to each of the three models were tested through correlational techniques, hierarchical regression analysis, and hierarchical linear modeling techniques. I have organized my discussion of the major findings in this dissertation according to research questions that correspond to the three conceptual models that I tested. I also provide a discussion of the primary contributions that this study makes, both theoretical and practical. Finally, I discuss the limitations of the study and provide suggestions for future research.

#### *Model 1 Findings – Validation of Four Leadership Roles*

The first model in my dissertation was developed to establish an initial baseline set of validity tests for the four internal team leadership roles. A large portion of Chapter 2 was dedicated to providing theoretical support and grounding in extant literature for the Navigator, Engineer, Social Integrator, and Liaison roles. However, since these four roles have not been previously articulated nor empirically examined, it was very important that I begin by ensuring that these roles were identifiable and meaningful to actual team members engaged in work. Overall, there was solid support for Model 1.

I began by examining the extent of agreement regarding engagement in the four team leadership roles. According to the ideas in interactional role theories, behaviors become patterned into sets of broad goals as team members interact with one another dynamically, thereby establishing expectations for future behavior (Turner, 2002). Thus,

engagement in a particular team leadership role must necessarily be accompanied by behaviors that are targeted at the broad goals representative of that leadership role. While one advantage of using roles as a lens for examining internal team leadership is that individuals are not constrained to precise behaviors in order to be considered as exercising a particular form of leadership, it is nonetheless crucial to the validity of these roles that team members be able to identify the degree to which others are enacting a particular leadership role and its broad goals. Therefore, general patterns of agreement among team members regarding types of leadership displayed by their teammates are important in demonstrating the validity of the four internal leadership role constructs.

The findings for this first critical hurdle offered fairly strong support for the level of agreement regarding the four team leadership roles. The  $r_{wg}$  statistics for all four roles at each of the three points in time were generally high, and supported the fact that team members were in general agreement about the type and degree of leadership displayed by their teammates. I also examined distributions of the  $r_{wg}$  statistic for each of the four roles at all three points in time and found that there was a consistent negative skew to the distribution, with the greatest concentration being in the .60 - .90 range. The mean  $r_{wgs}$  for the roles were somewhat lower than is typically found for team level constructs using Likert scales (Bliese, 2000; Kozlowski & Hattrup, 1992). However, this is to be expected since the roles were measured with a single item, and perceptions of each individual team member's behavior are likely to be more varied than perceptions of a team-level phenomenon. In addition to the support for agreement provided by the  $r_{wg}$  statistics, the ICC statistics also provided further evidence that there was agreement among team members about leadership displayed by their teammates. The ICC(1) scores for the roles

showed that there was generally a strong level of inter-rater reliability, and the ICC(2) scores for the roles showed that the average ratings on each role for an individual were fairly stable. Thus, overall, there was abundant evidence that team members are able to identify and distinguish who in their team is engaging in each of the four types of leadership.

The one internal team leadership role that was perhaps somewhat more difficult for team members to perceive and agree on was the Social Integrator role. The one ICC(1) statistic that was fairly low was for the Social Integrator at Time 1 (equal to .07). This might be explained by the team's stage of development at Time 1. In the first meeting or two there may have been a fairly quick establishment of team norms and goals (Gersick, 1988) or perhaps inadequate time for Social Integrator leadership to truly emerge. This explanation is supported by the fact that both the mean and the standard deviation for the Social Integrator role were the lowest of the four roles at Time 1 and seem to be hovering close to the midpoint of the scale. However, further examination of Table 3 shows that the ICCs (both 1 and 2) for Social Integrator are consistently the weakest of the four team leadership roles. Therefore, while the pattern of statistics for the Social Integrator role does not cause concern that it is unreliable, it is worth noting that it seems to be somewhat less reliable than the other three leadership roles. This may be an indication that this role is less clearly identifiable to specific individuals or that it is more typically distributed throughout the team than the other three leadership roles. Related to this idea is the fact that the Social Integrator role involves managing the interpersonal relationships and team climate within the team as opposed to facilitating

task or goal accomplishment. Thus, the Social Integrator leadership role may be somewhat broader in scope and slightly less distinct than the other three roles.

In addition to being identifiable and measurable by team members, it was also important to establish that the four internal team leadership roles were empirically distinct from one another (i.e., demonstrated differential validity). My articulation and development of the roles in Chapter provides a rationale that these are conceptually distinct from one another, although they are clearly related to one another since each role represents a particular type of leadership being exercised. While the zero-order correlations confirmed the relatedness of the roles, they were found to be fairly high which gave rise for some concern about whether they were adequately distinct measures. However, confirmatory factor analyses provided evidence that the measures of the four roles at three points in time point towards a model of four related but distinct factors representing each leadership role – Navigator, Engineer, Social Integrator, and Liaison.

Finally, it was important to establish some initial evidence of the predictive validity of the four internal team leadership roles. It would not matter that the roles are identifiable and distinct from one another if they are not related to valued outcomes. I therefore hypothesized that engaging in each of the four leadership roles would be positively related to an individual's contributions to the team. The basic rationale here was that exercising leadership should be providing a valuable service to the group and should result in being perceived as a strong contributor to the team. Here again, the evidence was strongly supportive of this relationship, with the exception of the Social Integrator leadership role at Time 1. Overall, it appears that providing one of the four

types of leadership articulated in this dissertation results in strong perceptions of being a useful contributor to the team.

### *Model 2 Findings – Moderator Variables*

The second model in my dissertation sought to expand on the first model by including two potentially important moderator variables. Having established an initial level of empirical support for the validity of the four internal team leadership roles, I next sought to consider how the perceived contribution of each role might be affected by changes in demands due to the team's developmental and task cycles (Kozlowski et al., 1996) as well as the overall structure of the four leadership roles at the team level (Levesque et al., 2001). I therefore examined the moderating effects of time and team role differentiation, which I will discuss here in turn. While there were significant findings for each of these moderator variables, they were generally not in support of the set of a priori predictions for Model 2, thus raising many new questions regarding these particular variables and their relationship with internal team leadership roles.

The first moderator variable that I examined was time, and I developed a set of specific predictions about when each role would offer the strongest contribution to the team. First, I predicted that the Navigator role would be most strongly related to contributions at Time 1 versus Times 2 and 3. This hypothesis was not supported; in fact, there was a significant negative result here indicating that the Navigator role is more strongly related to individual contributions at Times 2 and 3 than at Time 1. The regression results also supported this general trend of a stronger relationship between Navigator leadership and individual contributions as the projects progressed. Thus, it appears that in this sample of consulting teams, Navigator leadership is more highly



related to being viewed by others as a strong contributor after the initial stage of a team's life.

There are a couple of potential explanations for this pattern of results, which was opposite to my prediction. One possibility is that there is a significant component of motivation and focus on the task and purpose inherent in Navigator leadership. Thus, in a consulting team environment where the outcome is rarely clear or specifically defined, it is possible that the Navigator role becomes increasingly important to the team as it nears the end of its rather ambiguous journey. Research on goal distance has found that proximal goals tend to be more energizing than distal goals (Locke and Latham, 1990), so perhaps the heightened awareness of the approaching deadline coupled with uncertainty about the outcome result in a greater need for re-establishing and maintaining a clear focus and direction, specific goals, and motivational communication. As individuals are able to provide this kind of Navigator leadership to the team and, quite literally, help it finish the process of navigating its own journey to completion, their services may be far more appreciated and seen as a critical contribution. Therefore, outcome uncertainty may be an important boundary condition in the relationship between Navigator leadership and individual contributions.

Another possible explanation for this finding has to do with the timing and interpretation of the survey measures. Team members received clear instructions when completing each survey to think about the couple of weeks immediately prior and to respond to the questions as they would rate the individual at that point in time. However, it is possible, particularly at Time 3 when the teams are somewhat weary of these projects (and the semester in general) and are completing a repeated measure for the third time,

that they are not paying close attention to the survey instructions and are therefore providing a response that is more reflective of the person's leadership and/or contributions over the entire life of the project. Therefore, it is possible that this strong positive relationship between Navigator leadership and individual contributions is really an indication of the overall strong value placed on this type of leadership throughout the life of a consulting project. Perhaps the contribution of leading the team to set an effective direction is not fully evident to team members until later in the team's life cycle when they are able to judge whether the direction was a good or effective one. Keeping in mind that these teams receive feedback from their client at the midpoint and end of the consulting project, it is likely that this feedback influences team members' perception of the contributions for those engaging in the Navigator role.

Second, I predicted that the Engineer role would be more strongly related to individual contributions to the team at the beginning and middle of a team's life than at the end. This hypothesis was also not supported. Examination of the regression results indicates that the strongest relationship occurs at Time 2. This makes sense in light of Gersick's (1988) model of punctuated equilibrium where teams make significant changes to their norms, such as role structures and approach to the task, around the midpoint of a task cycle. Thus, the Engineer role may provide the strongest contribution to the team at this critical juncture. However, there was also a strong relationship with contributions at Time 3, which was not significantly different than the effect at Time 2 as confirmed by a post hoc test of this effect in HLM. Therefore, it appears that the contributions of Engineer leadership are important and valued throughout the life of teams engaged in complex and ambiguous knowledge work.

Third, I predicted that the Social Integrator role would be more strongly related to individual contributions to the team at the midpoint of a team's life. This hypothesis was also not supported. Examination of the regression results for the Social Integrator role indicates that the strongest relationship with contributions occurs at Time 3. However, this relationship was not significantly different than the effects at Time 2 and Time 1 as confirmed by a post hoc test in HLM. This is a surprising finding, given that each of the two primary models of team development would seem to indicate the contributions of Social Integrator leadership at earlier stages in a team's lifecycle rather than at the very end (Gersick, 1988; Tuckman, 1965). However, in these consulting projects the stress levels tend to build and completion of final deliverables usually comes together late in the project, so those team members who are able to lead the team to maintain a cohesive spirit, resolve conflict, and value the contributions and suggestions of all team members are providing very valued contributions to the team.

Finally, I predicted that the Liaison role would be positively related to individual contributions throughout the team's lifecycle, and would show no significant differences in these relationships across time. This hypothesis received little support. While the relationships were not significantly different across time as predicted, there was no significant relationship between Liaison leadership and individual contributions at Time 1 or Time 3. Further, the regression analyses showed that the significant relationships at Time 2 explained only 3% of the variance above and beyond the effects of control variables. In retrospect, it is possible that teams are attending to their internal goals and dynamics early on (Choi, 2002; Sundstrom et al., 1990), and therefore not engaging their external constituencies until later in the process (around the midpoint at Time 2).

However, the overall lack of significant relationships is once again a very surprising finding, particularly due to the fact that the only formalized roles that exist in these teams are Liaison roles. Each team has a specified liaison to their client and to their faculty advisor in order to facilitate more efficient communications among these parties. Often those elected to these liaison roles early in the team's life are individuals demonstrating initiative and desire to serve and contribute to the team, factors that should be theoretically related to the eventual exercise of Liaison leadership. Thus, the overall weak relationships between Liaison leadership and individual contributions to the team came as a real surprise.

There are several potential explanations for the generally weak relationships between Liaison leadership and individual contributions to the team. First, it is possible that the ratings for the Liaison role are influenced by the fact that there are formally designated roles for liaison activity. Although the instructions in the measures allow participants to rate multiple people as "strong" on any particular role (there is not negative independence in the ratings), it is possible that some felt obligated to rate those in the formal roles as higher than others on the team. This may be part of the reason that there is a higher standard deviation for the Liaison role than the other roles at all three points in time. If this is in fact the case, then the results would suggest that those who take on these formal liaison roles are generally not viewed as strong contributors to the team. This seems like a highly unlikely perception given the salience of the liaison roles to the team.

A second explanation for the weak relationships between Liaison leadership and contributions is that some team members who take on these formal liaison roles are not

doing as much heavy lifting on other aspects of the task. They may spend large amounts of time communicating back and forth between the team and its client and/or advisor, and therefore they feel that they have done their job. However, much of this activity may take place outside of the team's presence and may not be seen as a highly valued contribution. In order to examine this possibility, I ran post hoc analyses of the relationship between dummy codes for client and faculty liaison status and individual contributions to the team. While the client liaisons were seen as increasingly positive contributors at Time 2 ( $r = .16, p < .10$ ) and Time 3 ( $r = .19, p < .05$ ), the relationships for the faculty liaison dummy code were consistently not significant (with  $r = .05$  at Time 1,  $r = .03$  at Time 2, and  $r = .09$  at Time 3). These findings are consistent with those in research on team boundary spanning behaviors in consulting teams by Marrone (2004), who found that boundary-spanning to clients was positively related to individual contributions and leadership, while boundary spanning to faculty advisors was not significantly related to this outcome. Therefore, the faculty liaisons in these consulting teams may not be providing a highly valued contribution in this role, and yet still score highly on peer ratings of the Liaison leadership role thereby reducing the overall correlation between Liaison leadership and individual contributions. In retrospect, the fact that these two formal liaison roles deal directly with different stakeholders may suggest that future research can benefit from carefully considering the operationalization and measurement of the Liaison role. Specifically, a careful consideration of different targets of Liaison leadership is warranted given the fact that formal client liaisons clearly provided valued contributions while formal faculty liaisons did not.

A third explanation which I think is the most likely (and builds upon the previous suggestions that I have made) is that the Liaison leadership role in these consulting teams may not involve as much actual leadership of the team as it would in some other circumstances, particularly for the formal faculty liaison role. Due to the fact that there are already these formal roles established for communication purposes, there is perhaps less proactive seeking out and coordinating new relationships on behalf of the team. Thus, this potential leadership role is reduced to somewhat more of an administrative function that is seen as a baseline necessity but not something that is highly valued as a contribution. While there are likely individuals in some or perhaps many of these teams that are truly exercising Liaison leadership with their team, the salience and opportunity for this type of leadership may be greatly reduced in this setting. In addition, the faculty advisor may in many cases be seen as a sort of external leader for the team who is able to engage in many of the boundary spanning functions which have been demonstrated to be important for leaders of self-managed teams (Druskat & Wheeler, 2003), thus further reducing the opportunity for this type of leadership to be exercised internal to the team.

In addition to time, the other moderator variable that was examined in Model 2 of my dissertation was team-level role differentiation. Teams with a more clearly defined role structure and greater distribution of roles were predicted to have a stronger relationship between each leadership role and individual contributions as a result of clearer patterns of expectation and communication (Levesque et al., 2001). Generally, there was not much support for this hypothesized positive cross-level effect of role differentiation. Only 1 of the 24 models that were examined was significant in the predicted direction – for the relationship between the Liaison role at Time 1 and

individual contributions at Time 2. Interestingly, the cross-level effect was significant here while the main effect for the Liaison role was not (see Table 8a). Thus, for teams with a more clearly defined leadership role structure, the Liaison role (which is the only formally designated team role in this sample) may be seen as a more clear contribution.

Although the predicted relationship was not found, there did appear to be a trend towards significant negative cross-level moderation for the Engineer and the Navigator roles at Time 3. Thus, for teams with lower levels of team role differentiation, there was a stronger relationship between these two roles and individual contributions, whereas for teams with higher levels of team role differentiation these two roles displayed a weaker relationship with contributions. I think the most likely explanation for this effect comes from the early leadership research conducted in the Ohio State and Michigan studies (Kahn & Katz, 1953; Stogdill & Coons, 1957). This research found two dominant types of leadership – initiating structure and consideration. Both the Navigator and the Engineer leadership roles are likely to be positively correlated with initiating structure, as discussed in Chapter 3. Lower levels of team role differentiation can be thought of as a lack of a clearly defined leadership role structure at the team level. Thus, these negative cross-level interactions at Time 3 are essentially showing that teams which lack a clear internal leadership structure perceive higher levels of contribution to be associated with leadership roles that help to establish task structure for the team, namely the Navigator and Engineer roles. By helping their teams to find and maintain a clear purpose, direction, and goals, and to manage the task and workflow needs and dynamics present within the team, these two roles provide important contributions that help establish

valuable order and structure. This kind of influence is evidently more important for teams that are lacking a clear leadership role structure within the team.

Overall, there was not very much support for the predicted relationships in Model 2. However, there were some interesting and significant counter-findings for both the time and role differentiation moderators. This dissertation represents a ground breaking and therefore somewhat exploratory effort to research the dynamic nature of internal team leadership roles. Clearly further work is needed on these moderators to better understand these and other important contingency factors related to the contributions of internal team leadership roles.

#### *Model 3 Findings – Leadership Role-structuring Variables*

The third model in this dissertation sought to examine individual outcomes of the manner in which individuals structure their engagement in internal team leadership roles. Having examined the validity and contingencies for the four internal team leadership roles, I next sought to consider differences in three specific role-structuring processes – role overlap, role switching, and role sharing. Role overlap refers to simultaneous engagement in multiple roles and role switching involves changes from one role to another across time. Role sharing is a between-member role-structuring process of occupying the same role by more than one person. Each of these three processes were predicted to have an impact on individual outcomes. There were four outcomes of interest in model 3. The first was a continued look at individual contributions as this is likely to have an important impact on team success as well as individual job and career success. However, it is important to also consider some of the potential costs associated with different role-structuring processes. To this end, the remaining three outcomes were



satisfaction with the team experience and two individual role stress variables – conflict and ambiguity. These three all represent potential personal hindrances to engaging in team leadership roles, and are therefore important to consider.

Overall the findings for model 3 were quite mixed. Role overlap and role switching were found to predict individual outcomes, while role sharing was not found to be a consistent predictor in this particular sample. However, there was a very high correlation between role sharing and role overlap, so it is likely that role overlap was leaving little variance left for role sharing to explain in the regression models. I will briefly discuss the findings for each of the three role-structuring processes.

First, role overlap was hypothesized to have a positive relationship with both individual contributions to the team and role conflict. While the contributions prediction received very strong support at Time 2 and Time 3, the prediction for role conflict was not supported. In fact, there was again a significant counter-finding. In this sample there was a significant negative coefficient for two out of the three coefficients tested. Put into clear language, this finding suggests that the greater the amount of role overlap a team member is involved in, the less role conflict he or she experiences. This finding seems quite strange when the roles are considered one at a time; however, it is possible that role overlap by an individual causes a greater degree of blurring of the perceived distinction between leadership roles. In other words, perhaps the broader the scope of an individual's leadership, the clearer the expectations placed upon his or her set of behaviors. The expectations are thus not in conflict with one another, which is the hallmark of role conflict; rather they are simply expectations for broader exercise of leadership across more than one leadership role. There were also two unhypothesized

significant relationships between role overlap and satisfaction with the team experience at Time 3 and a negative relationship between role overlap and role ambiguity at Time 3, which are both likely related to having clearer leadership expectations from the team and also higher perceived contributions. However, while not statistically significant, the sign of the coefficients for satisfaction at Time 1 and Time 2 were both negative, suggesting that this satisfaction is more of a retrospective attitude than an experience of the process. Individuals engaging in role overlap thus appear to have a strong willingness to “do what it takes” in order to provide leadership for the team resulting in a broad set of leadership expectations and also greater contributions and possibly satisfaction.

Second, role switching was hypothesized to have a positive relationship with individual contributions as well as conflict and ambiguity. The basic rationale here was that individuals who are willing to be a team player and make adjustments will be viewed as positive contributors to the team’s goals, and ideally are switching away from leadership roles that they are perhaps less effective in and towards roles in which they can better influence the team. However, making these adjustments midstream may still result in expectations for both roles from fellow team members as well as a lack of clarity regarding how to engage in leadership of the team.

The results provided mixed support for this set of hypotheses. Role switching was unrelated to individual contributions at any point in time. It appears that switching leadership roles in this sample may have been perceived by team members as either struggling to find an appropriate area of leadership or simply a lack of leadership. Team members may have engaged in role switching as a result of incompetence to exercise

leadership, or possibly in order to fulfill an unmet leadership need within the team that they may or may not have been capable of effectively meeting.

However, there was strong support for the effects of role switching on role conflict. Team members who engaged in leadership role switching had a significantly higher experience of conflict about what their leadership role involved, facing a variety of expectations from their fellow team members that were not always consistent. There was only weak support for the relationship between role switching and role ambiguity. While the coefficients were positive at all points in time as predicted, Time 3 was the only coefficient that achieved a marginal level of significance. Thus, conclusions regarding the role ambiguity outcome remain tentative. In addition to these hypothesis tests, there was also a consistent unhypothesized finding for a strong negative relationship between role switching and satisfaction with the team experience. This finding provides some tentative support for either the incompetence or unmet needs arguments (above) for why switching was not related to contributions. If team members switched leadership roles due to perceived or actual incompetence to exercise leadership, the likelihood that their experience was a frustrating one is fairly high. Similarly, if individuals were forced to switch leadership roles in order to fill an unmet need in their team, they may not see themselves as particularly fit for or interested in exercising the needed type of leadership and may therefore have a lower level of satisfaction.

Overall, the pattern of findings suggests that role switching is not a useful strategy for structuring one's engagement in team leadership. There was no support for any benefit to the individual, such as being perceived as a stronger contributor; however there were many costs associated with switching leadership roles. Switching roles across time

was associated with higher levels of role conflict and lower levels of satisfaction with the team experience. It also was a potential positive predictor of role ambiguity. Thus, it appears that switching leadership roles across time generally adds to the personal stress of team members without any related benefit. It remains to be seen whether there is a benefit to the teams in terms of improved performance when team members switch leadership roles, or whether this simply represents a lack of clear direction and focused leadership at the group level.

Finally, role sharing was hypothesized to have a negative relationship with individual satisfaction with the team experience, and a positive relationship with the level of role ambiguity experienced by those sharing roles. However, the findings did not support either of these hypotheses. It is possible that some members enjoyed sharing their leadership roles while others did not, thus resulting in an overall null finding. Future research might consider examining individual differences in the value of social rewards, such as the need for affiliation (McClelland, 1975), or interpersonal factors such as the quality of relationship between the team members (TMX – Seers, 1989) that may serve as moderators of the relationship between role switching and satisfaction.

The only significant finding for role sharing was a positive relationship with contributions to the team at Time 2. However, there were very high zero-order correlations between role sharing and role overlap that resulted in strong multicollinearity effects in the regression analyses. Apparently there was a tendency for more than one person in these teams to engage in multiple leadership roles, such that these individuals experienced both role overlap and role sharing at the same time. This would appear to be the effect of shared leadership within teams (Carson et al., 2005), although further work

at the team level is needed in order to more clearly understand these dynamics of overlap and sharing. Overall, though, it appears that role overlap is the more important variable to consider in this particular sample of consulting teams.

### *Theoretical Contributions*

This dissertation provides several important contributions to theory and should serve as a foundation for further work examining internal leadership in teams. In this section I highlight what I believe to be the most important of these contributions.

First, the articulation of four internal team leadership roles – Navigator, Engineer, Social Integrator, and Liaison – represents an important groundbreaking advance in our understanding of leadership dynamics in teams. By reviewing and synthesizing the existing work on team leadership into four leadership roles that are theoretically meaningful, I provide a concise typology of the primary ways in which team members may exercise leadership within their teams. Scholars such as Gibb (1954), Hollander (1985), and Barry (1991) have suggested sets of leadership roles that might be shared internally by team members, and Zaccaro and Marks (1999) have offered a set of team leadership roles that is based in the functional perspective of team leadership (Hackman & Walton, 1986). This dissertation integrates the ideas from these perspectives into a single coherent set of leadership roles that may be exercised internally by team members themselves. It also goes beyond these prior theoretical efforts by offering an empirical examination of these roles in teams without a formal external leader.

The empirical results in this dissertation provide an initial validation of these four leadership roles, demonstrating that they are discernible by team members and positively related to contributions. These roles provide a lens through which internal team

leadership can be examined on an ongoing basis, which has important implications for team leadership issues such as shared leadership, team leader selection and development, and emergent leadership. Each of these three areas are in need of improved theory and further empirical study, and the four leadership roles provide an opportunity to empirically examine these complex phenomena on a more detailed and conceptually meaningful level.

Second, this dissertation provides important empirical evidence that engagement in each of these four leadership roles is related to perceptions of individual contributions within the team. By developing a measure of these roles that demonstrated initial convergent and discriminant validity, I have demonstrated that there is value in further study using this typology. I have argued that roles provide a clearer lens and more meaningful unit of analysis for studying the complex phenomenon of internal team leadership than do behaviors (which are often idiosyncratic and too fine-grained to provide consistent meaningful results) or simple votes for who provides leadership to a team (which are a bit too broad and lack a meaningful conceptual basis that has potential for replication across studies). Therefore, the initial evidence supplied in this study suggests that further work using this typology is warranted in order to better understand potential antecedents and outcomes of these four leadership roles and to begin developing a nomological net for internal team leadership.

Third, this study provides an important early understanding of how engagement in these four leadership roles relates to important individual outcomes across time and according to the leadership role structure of the team. By considering the relationship of each role to individual contributions across time, this study begins the initial steps of

unpacking the temporal dynamics of internal team leadership. The value and approach to leadership has long been thought to be contingent on the situation (e.g., Fiedler's (1967) contingency theory, Hersey & Blanchard's (1979) situational leadership theory, House's (1971) path-goal leadership theory, etc.) Recent theoretical work has also suggested that external leaders can provide important developmental functions for teams (Kozlowski et al., 1996), and empirical evidence has shown that these external team leaders engage in boundary spanning activities (Druskat & Wheeler, 2003) and respond to their teams based on situational and environment contingencies (Morgeson, 2005). This dissertation extends these lines of research by providing empirical evidence regarding the types of internal leadership that might be valuable to teams at different points in their life cycle. Although the evidence here is far from conclusive, the results of this dissertation suggest that engagement in leadership by team members is not only important early in a team's life but may grow increasingly important as the team gets closer to its eventual objectives. By also considering the impact of leadership role differentiation at the team level, this study begins to also unpack the multilevel dynamics of internal team leadership. The findings advance our understanding of the relationship between a clearly defined role structure and the perceived value of roles that help provide task structure, namely the Navigator and Engineer roles.

Fourth, this dissertation contributes to a better understanding of the complex nature of how individuals structure their engagement in leadership roles by articulating three role-structuring processes – role overlap, role switching, and role sharing. The findings support the fact that these processes can have important benefits (greater perception of contributions) and costs (greater stress and reduced satisfaction) for team

members who enact them. Team member engagement in leadership roles is not simply a yes/no or on/off phenomenon, but instead has important temporal and interpersonal elements. By articulating these three processes and examining them empirically, we now have greater insight into how the complexity of engaging in internal team leadership affects individual team members.

### *Practical Implications*

In addition to these contributions to theory, the findings from this dissertation have a number of practical implications for individuals working in team settings and for organizations seeking to improve the leadership and functioning of their teams. I will first discuss the practical implications for individual team members since that was the primary focus of this study, and will then turn my attention to implications of these findings for managers and organizations seeking to improve the leadership of their teams.

First, this study suggests that individuals seeking to provide leadership in their team should consider a number of different ways to do so. Rather than viewing leadership as “being in charge” or directing the team’s efforts, team members can take a broader view and consider that they may provide valuable influence in four unique ways. The Navigator, Engineer, Social Integrator, and Liaison roles were each associated with individual contributions, so team members can take stock of their own strengths as well as the team’s needs and consider which of these four leadership roles would be the best fit.

The findings also suggest that certain roles may be more valuable at different points in the team’s life. There is a common perception that leadership involves taking charge quickly and making or influencing decisions as early as possible. Rather than



seeking to establish dominance early on or jockey for a “position of power,” the results of this study suggest that providing leadership as the life of the team moves onward is very important. In particular, the Navigator and Social Integrator roles were strongly associated with contributions at the end of the team’s life.

Second, this study suggests that individuals should consider how clearly structured and differentiated the leadership roles in their team are before deciding how best to contribute team leadership. For individuals who find themselves in teams with a clearly defined leadership role structure, the best advice may be to stick with your role. However, for teams with less clearly defined leadership role structures, those who want to make an important contribution should consider engaging in Navigator and Engineer forms of leadership in order to provide focus and order to the team’s task.

Third, this study provides important evidence regarding the benefits and costs associated with different role-structuring processes. The evidence suggests that more is better in terms of taking on more than one of these leadership roles. Team members who were able to provide multiple forms of leadership to their teams were found to be stronger contributors over time. However, there is an important caution here as well. Switching leadership roles across time was not a useful way to manage one’s involvement in leadership in this particular sample. Role switching had no effect on perceived contributions, but came at a price of greater role confusion and stress, and decreased satisfaction with the team experience.

Although this study was conducted at the individual level of analysis, I believe there are a couple of important implications for managers and organizations who want to improve the internal leadership dynamics in their teams. First, managers should make it

clear that there are a number of ways in which to exercise leadership in team settings. Teams need different types of leadership at different times, so it is important that organizations develop an understanding of different ways in which leadership can be exercised in teams through training and mentoring efforts. Second, managers should encourage team members to find a leadership role that is well suited to their personal strengths and the team's needs and stick with it. Role switching was found to have several downsides in this study and should therefore be avoided if possible. Finally, managers should consider either seeking to structure the team's leadership roles early on or else emphasize the importance of the Navigator and Engineer roles in creating task structure for the team. This should result in clearer contributions by team members and lower levels of confusion and stress.

#### *Limitations and Future Direction*

As with all research, this study had to balance various considerations and thus was not without limitations. First, the focal variables in this study – four leadership roles and three role-structuring processes – were developed for this study since there were no pre-existing measures of these constructs. Although care was taken to assess the validity and reliability of these measures and empirical findings yielded adequate results, they have not yet been subjected to a more extensive evaluation across different samples. Future research should seek to apply these measures with different types of work teams (Sundstrom et al., 1990), and further work is also necessary to develop a more complete nomological net including both antecedents and outcomes of these constructs. Other outcomes of interest will depend on the nature of the teams being studied, but may include such constructs as team goals for the Navigator role, team process variables and

task interdependence for the Engineer role, potency and conflict for the Social Integrator role, and strategic focus (external vs. internal) for the Liaison role. Potential antecedents to consider include job/task knowledge, diversity of experience, and proactivity for the Navigator and Engineer roles, empathy for the Social Integrator role, and social network variables such as network range and betweenness for the Liaison role.

Second, there is a possibility of common method bias and/or demand effects due to the repeated measures design of the study. I was able to separate the raters of important independent (leadership roles) and dependent (contributions) variables, thus greatly reducing the likelihood that common method bias influenced the results of the study. However, the possibility does exist that team members exposed to the same set of measures across time may have begun to pick up on some of this study's focus and influence their responses accordingly due to a social desirability bias. Future research should seek to further separate independent and dependent measures in order to replicate the findings of this study.

Third, the measurement of the four leadership roles involved rating a single item with a definition and a few sample behaviors for each role. While the use of multiple raters allowed for an assessment of inter-rater reliability, future studies might consider using more than one item to measure each leadership role. However, the use of a matrix measure such as the one in this dissertation with multiple items per role and several team members may produce some demand effects due to participant fatigue as a result of the lengthy measure. Future studies should also consider seeking to elicit measurement of these four leadership roles in other ways that do not assume the pre-existence of these four roles. While trying to specify precise behaviors for each role defeats the advantage

of the role approach and runs the risk of contextual limits on generalizability, other approaches to measurement of these roles would nonetheless serve to further validate their existence and relative importance in different types of teams.

Fourth, while the nature of the sample for this study offers many benefits in terms of investigation of these informal leadership roles, the use of student consulting teams to test the hypothesized models may nonetheless provide some limitations. While the nature of these projects is highly similar to professional consulting projects, the fact that these students were not full-time employees and did not receive compensation for their services may affect the attitudes and level of engagement for some team members. Further, some of these students have prior experience working for consulting firms while others do not, which may have had an effect on which participants engaged in greater levels of leadership. Another consideration is the nature of the task in this particular sample. These teams were engaged in knowledge work and operated in a team environment that was highly interdependent. While the findings should generalize to other teams such as this, the nature of the task and level of interdependence in teams are likely to affect the need for and contributions provided by each of the four leadership roles. For example, teams engaged in less knowledge-intensive work or tasks with fairly certain outcomes may benefit more from Engineer and Social Integrator roles. Similarly, all four of these leadership roles are likely to be affected by the level of task interdependence experienced by teams.

Fifth, this dissertation is limited by its failure to fully assess and understand the impact of team composition in a substantive manner. I was able to provide measures of several demographic variables, including age, GPA, and ethnicity, as controls in this

study. While these variables were statistically controlled for in the analyses, they were frequently found to have significant relationships with both independent and dependent variables in the study and thus may have a more important impact on team leadership roles and individual outcomes than I have been able to effectively assess. For example, this sample was perhaps somewhat unique in that 47% of the sample was of Asian ethnicity. This is clearly much higher than the proportion of Asians in the U.S. population in general, and therefore may have influenced the overall pattern of engagement in team leadership roles in this sample. Indeed, the Asian ethnicity variable was a significant negative predictor of both team leadership roles and individual contributions to the team, which was perhaps a result of somewhat weaker skills with the English language. While these Asian team members, mainly ethnic Chinese and Indian, seemed to provide less leadership and contributions to the teams in this sample, it is also important to note that this increasing proportion of Asian ethnic demography is increasingly common in organizational work teams today, particularly in knowledge work teams such as those found in this study. This study also found that age was generally a negative predictor of both contributions and leadership roles, and that GPA was generally a positive predictor of contributions and team leadership. Future research should thus examine the impact of a wider range of team compositional variables such as personality, cultural values, functional background, and tenure with the job and the team, in addition to the types of variables included in this dissertation. Future research should also consider examining relational demography as a useful framework for looking at how the overall team composition relates to internal team leadership.

This dissertation represents an effort to break new ground in our understanding of internal team leadership dynamics. As such, there are a multitude of research directions that might be pursued as a follow up to this study. I will briefly highlight a few that I think are particularly promising and important.

First, the findings of this study have focused on the individual level of analysis as a first step in understanding outcomes and moderators related to engagement in the four team leadership roles and the structuring of that engagement. By considering how individuals enter into and move through different leadership roles across time (Kozlowski et al., 1996; Zaccaro & Marks, 1999), this study has increased our descriptive knowledge of internal team dynamics, as well as an increased awareness of how individuals are affected by their involvement in team leadership. In addition to considering a greater number of individual outcomes, an important next step is to begin considering how these four roles operate at the team level. Consideration of the impact of each type of leadership as well as the overall configuration of these leadership roles on a team's performance and viability will provide a great contribution towards more prescriptive results for teams and organizations.

To elaborate further on the need to consider team-level phenomena, it is important to expand the range of outcome variables under consideration. While individual contributions are an important indicator that other team members value team leadership roles, most organizations are going to be more interested in how these four leadership roles ultimately relate to team level processes and outcomes. In addition to considering the impact of these four leadership roles on performance and viability, there are also specific questions that should be examined for each role as it relates to team processes

and emergent states (Marks et al., 2001). For example, does the Navigator role have a positive relationship with team goals (Locke & Latham, 1990) or possibly team processes such as adaptability (Kozlowski, 1998)? Does the Engineer role positively predict better team task coordination processes? Does the Social Integrator role positively relate to emergent states such as team cohesiveness or psychological safety (Edmondson, 1999) and team processes such as communication or relational conflict (Jehn, 1995)? Does the Liaison role have an impact on team boundary spanning processes (Marrone, 2004) or possibly social capital within an organization (Nahapiet & Ghoshal, 1998)? In other words, are these team leadership roles useful for improving the quality of teams and their interactions with one another and their environment? These questions will provide a very fruitful avenue for future research seeking to develop a more robust understanding of the impact of these four team leadership roles.

Another important and promising direction for future research is to begin applying the knowledge gained from this study to research on shared leadership. Existing work on shared leadership has found it to be an important predictor of team effectiveness, but to date has not provided much in the way of understanding the dynamics of shared leadership (Carson et al., 2005; Pearce & Conger, 2003; Pearce & Sims, 2002). By considering the overall level of these four roles, their distribution within the team, and their trajectory over time, scholars will be able to better understand what the sharing of leadership looks like within teams as well as how it relates to important team processes and outcomes. For example, should each of the four roles be shared and distributed throughout the team? Or is there perhaps a need for higher concentrations of certain leadership roles depending on the team type, nature of the task, or level of

interdependence? It is also important to consider how these four team leadership roles compile into the sharing of leadership across time, thus necessitating the use of longitudinal research designs. While this study has provided an important first look at how each leadership role relates to individual contributions across time, an important next step is to extend this work and consider how these patterns of internal team leadership over time relate to team performance and viability.

A third promising avenue for future team level research is in the area of social networks (Brass, 1984). The relationship between leadership roles and network structure is an important and promising area that would benefit from further work. Leadership roles are likely to be a result of both contributions and relationships within teams, so they therefore become both an interesting antecedent and outcome of social networks such as advice, friendship, and hindrance networks. It is possible that these social networks and an individual's position within them predict engagement in leadership roles as well as team level leadership role structures. It is also possible engagement in team leadership predicts subsequent network position and/or network structures. Network measures, particularly team density, have also been used to operationalize shared leadership in previous work (Carson et al., 2005; Tesluk & Gerstner, 2005). Thus, another important extension of team leadership roles will be to examine how the network structure of these specific types of leadership translates into shared leadership over time.

Another key area of future research should be to examine antecedents of each of the four leadership roles. Although much has been learned about team effectiveness (e.g., Cohen & Bailey, 1997), we know little about selection and development of team leaders (Hough & Oswald, 2000; Kozlowski & Bell, 2002). Future work should consider



predictors of both engagement in each of the four roles, as well as effectiveness in the roles using multiple criteria. Qualitative work may prove useful in better understanding the difference between engagement and effectiveness in these roles. By developing an understanding of individual, relational, and team-level characteristics that are predictive of each role, scholars will be able to better understand issues related to the selection and development of team leaders. Predictors to consider can include variables such as personality, knowledge, and experience at the individual level, aspects of social networks at the relational level, and variables such as task interdependence and outcome uncertainty at the team level.

Finally, it is important to note that leadership research in general, and studies of team leadership in particular, should give more attention to the use of qualitative methods. While this dissertation and other quantitative studies of team leadership can help to establish statistically significant relationships between various theoretical constructs, a richer story needs to be told in order for the development of practical and actionable knowledge. Future research should thus consider the use of techniques such as ethnography and grounded theory building (Eisenhardt, 1989), which allow the researcher to get closer to the inner workings of internal leadership dynamics and to paint a more nuanced picture than is possible with quantitative hypothesis testing. For example, in this dissertation the moderating role of time was found to be a significant predictor for some of the team leadership roles, but was not at all consistent with the hypothesized predictions. Qualitative work in the future may be able to better understand how these four roles relate to one another, and how they impact contributions to the team over time.

### *Conclusion*

In conclusion, this dissertation has been an important first step in advancing our understanding of internal team leadership dynamics and their effects on individual team members. Although there have been calls for a better understanding of the leadership provided by team members themselves, there has been little empirical work on this topic to date. By specifying the four internal team leadership roles of Navigator, Engineer, Social Integrator, and Liaison, this dissertation has advanced a conceptual understanding of the types of team leadership that may be exercised by team members. This typology was supported through initial efforts to validate these roles, their reliability, and their predictive relationship with team member contributions.

The findings of this study suggest that these roles are useful to teams, and should provide a fruitful avenue for continued study. Team members that engaged in these roles were consistently found to provide important contributions to the team. There were significant temporal and multilevel moderating effects for these relationships that warrant further attention. The study also provided evidence that taking on more than one of these roles as an emergent team leader is likely to have beneficial outcomes, but that switching roles across time should not be a recommended course of action. These findings provide an initial foundation that will hopefully provide a fruitful avenue for research on internal team leadership for many years.

## Appendix 1 - Survey Measures

### Internal Team Leadership Roles (developed for this study)

For each of the following potential leadership roles, please *FIRST* read the role definition and sample behaviors carefully and then rate the extent to which **YOU** perceive each team member to be providing this type of leadership influence to your team at this point in time. **Please note that team members can engage in multiple leadership roles within your team, and that leadership roles may also either be shared by one or more team members or not performed at all.**

Please use the rating scale below by circling the appropriate number. (1= not at all; 2 = to a little extent; 3 = to some extent; 4 = to a great extent; 5 = to a very great extent).

<u>At this point in time, to what extent has each team member engaged in the following team leadership roles?</u>	<b>Name: Member A</b>	<b>Name: Member B</b>	<b>Name: Member C</b>
<p><b>Navigator</b> – Helps to establish the team’s purpose and direction, and keeps team focused on that direction as it proceeds with its work.</p> <ul style="list-style-type: none"> <li>• Initiates and energizes team action in pursuit of its purpose and goals</li> <li>• Communicates and reminds team of its overall purpose</li> <li>• Helps develop specific goals towards achieving team’s purpose</li> </ul>	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
<p><b>Social Integrator</b> – Helps to develop and maintain team cohesiveness and effective conflict management.</p> <ul style="list-style-type: none"> <li>• Ensures effective communication and collaboration among members</li> <li>• Helps develop healthy team norms, team cohesiveness, and promotes active involvement of ALL team members</li> <li>• Facilitates effective conflict resolution within the team</li> </ul>	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5

<p><b>Liaison</b> – Helps to develop and maintain positive and useful relationships with external stakeholders.</p> <ul style="list-style-type: none"> <li>• Serves as an advocate for the team and solicits needed outside resources and help</li> <li>• Seeks out and coordinates relationships with client contacts, faculty, and other external parties</li> <li>• Solicits information and feedback from client contacts and faculty advisor</li> </ul>	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
<p><b>Engineer</b> – Helps to structure and restructure the team and the task in the most efficient and effective ways for meeting goals.</p> <ul style="list-style-type: none"> <li>• Manages internal task and workflow dynamics of the team – Who does what, and When (relevant timelines)?</li> <li>• Matches tasks with individual strengths and skills in order to optimize members' individual contributions to the team</li> <li>• Pushes the team to clarify roles and responsibilities for individual team members</li> </ul>	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
<p>Currently, this person is engaging in <u>more than one</u> of the four leadership roles described above. <b>(Role overlap)</b></p>	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
<p>Since the first few weeks of the project, this person's leadership role on the team has <u>shifted from one role to another</u>. <b>(Role switching – Times 2 and 3 only)</b></p>	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5

Currently, this person is <u>sharing</u> at least one of the four leadership roles described above with another team member. <b>(Role sharing)</b>	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
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**Role conflict** (adapted from Rizzo, House, & Lirtzman, 1970 and House, Schuler and Levanoni, 1983, \* denotes additional validation in a cross-national study by Peterson et al., 1995)

*To what extent do you agree with the following statements (1= strongly disagree; 5 = strongly disagree)*

1. I often receive incompatible requests from two of more people associated with my team (can include requests/expectations from clients, advisor, etc.)\*
2. I often do things for the team that are well received by some team members and not accepted by others on the team.
3. The team places expectations on me that are not consistent with my own understanding of my role on the team.
4. I often find myself in situations on this team in which there are conflicting requirements or expectations about my role.\*
5. I find it is often hard for me to please everyone when working on this project.

**Role Ambiguity** (adapted from Rizzo, House, & Lirtzman, 1970 and House, Schuler and Levanoni, 1983, \* denotes additional validation in a cross-national study by Peterson et al., 1995)

*To what extent do you agree with the following statements (1= strongly disagree; 5 = strongly disagree)*

1. I know exactly what is expected of me on this team. (R)\*
2. I feel certain about how much authority I have on this team. (R)\*
3. I know what my responsibilities are on this team. (R)\*
4. My responsibilities on this team are clearly defined. (R)\*
5. I have clear, planned goals and objectives for my job on this team. (R)\*

**Satisfaction with Team Experience** (Gladstein, 1984)

*To what extent do you agree with the following statements (1= strongly disagree; 5 = strongly disagree)*

1. I am satisfied with my present teammates.
2. I am pleased with the way my teammates and I work together.
3. I am very satisfied with working in this team.

**Individual Contributions** (adapted from Marrone, 2004)

*Please write in the names of each of your team members on the first row of the matrix below. Then, respond to the following statements on the left-hand column using the rating scale below by circling the appropriate number. (1 = not at all; 5 = to a very great extent).*

<u>At this point in time, to what extent has this team member:</u>	<b>Name:</b>	<b>Name:</b>	<b>Name:</b>
... provided high quality contributions to the project?	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
... contributed original ideas that have benefited the project?	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
... shared his/her expertise in ways that have benefited the team?	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
... been seen by others on this team as a critical part of your team's overall success?	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5

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