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Leader-Member Relationships in Virtual World Teams

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THE FLORIDA STATE UNIVERSITY
COLLEGE OF BUSINESS

LEADER-MEMBER RELATIONSHIPS IN VIRTUAL WORLD TEAMS

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To my committee members, who smiled at the context but believed in my research anyways

To my parents, for their encouragement of lifelong learning and prayers and support

To Paul, for the faithful companionship along this journey

To Melissa, for understanding my need to do this and sticking with me regardless

To Molly, for the inspiration, guidance, helping hand, and tireless example to follow

To Elizabeth, "Emmie", "Hope", and Daniel, for the endless smiles during difficult times and for helping me realize why I persevere

Act boldly, for if you are afraid to try, you may not fail but neither will you succeed

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ABSTRACT

As researchers today seek to understand how virtual worlds may be effectively leveraged for collaborative purposes, exploring the role of leadership in virtual world teams may help shed light on how to manage synchronous and highly interdependent work activities for better team outcomes. Based upon Leader-Member Exchange (LMX) Theory, this dissertation seeks to understand how leadership affects team member performance and proposes that 1) the relationship between a leader and a team member influences the degree to which a team member is allocated and develops resources and 2) to the extent which a team member receives or develops resources, their performance will be enhanced.

Findings from a field survey of 61 members in a large virtual world team (VWT) within the MMORPG Everquest suggest that leader-member relationships matter, having a direct impact on members' allocation and development of resources. However, a mediation test strongly suggests that it is the quantity and the type of resource that impacts performance and not the direct influence of the leader-member relationship. From a theoretical standpoint, opening the "black box" of LMX theory has revealed more precise causal mechanisms by which leader-member relationships impact performance. The influential resources identified include two dimensions of empowerment, access to better work assignments, benevolence-based trust, obligation, and identification. From a practical standpoint, this research provides guidance into what leaders may do to effectively management VWTs. For example, better member performance could be achieved through coaching and avoiding micro-management, providing members with better team assignments, and binding VWT members to each other such that collective interest replaces self-interest.

CHAPTER 1

INTRODUCTION

Advances in computer-mediated communication (CMC) technologies have brought about rapid changes in the workplace. The last two decades have seen an IT-enabled move away from traditionally organized firms to networked firms where work is performed by virtual teams (Jarvenpaa & Leidner, 1999). Virtual teams are typically comprised of domain-specific subject matter experts from a variety of functional areas and are coordinated through the use of CMCs (Maznevski & Chudoba, 2000). While the benefits organizations may derive from virtually distributed work are significant, a large body of literature suggests that working in virtual teams is difficult due to a variety of idiosyncratic challenges (Martins, Gilson, & Maynard, 2004; Webster & Staples, 2006). Specifically, the difficulties associated with coordinating and controlling virtual work increase as the degree of virtuality, or the separation between team members, increases. For example, challenges for virtual teams include finding ways to mitigate the disruptive effects of geographical, temporal, cultural, and technology-mediated separation, called discontinuities (Watson-Manheim, Chudoba, & Crowston, 2002).

One factor identified that may mitigate the effects of these discontinuities is leadership (Zigurs, 2002). Leadership is an essential element for success in virtual teams (e.g., Bell & Kozlowski, 2002; Yoo & Alavi, 2004). Several early studies provide evidence that effective leadership impacts important team outcomes such as performance and satisfaction (e.g., Jarvenpaa & Tanriverdi, 2003; Kayworth & Leidner, 2002). Yet, many scholars have remarked that much remains unknown about leadership within virtual teams because studies to date have tended to be atheoretical, practitioner-oriented, case-based, and descriptive (e.g., Bell & Kozlowski, 2002; Gibson & Cohen, 2003). Promising theoretical breakthroughs and empirical validations of existing leadership theories from organizational studies remain few in virtual settings (Hertel, Geister, & Konradt, 2005; Martins et al., 2004; Pinsonneault & Caya, 2005; Powell, Piccoli, & Ives, 2004; Webster & Staples, 2006). This paucity of research calls for more empirical studies of leadership within virtual teams (Yoo & Alavi, 2004).

Moreover, new ways to collaborate via technology have emerged that warrant investigation. For instance, how and where work is accomplished is being shaped by participation in new CMC environments such as virtual worlds. Virtual worlds are IT-enabled

virtual environments in which participants communicate and interact via digital embodiments representing themselves, or avatars. K Zero (www.kzero.co.uk), a leading consulting company which specializes in tracking virtual world demographics, monitors over 60 virtual worlds with greater than 1 million registered users and estimates that there are nearly 300 million registered users of virtual worlds globally.

Virtual worlds have rapidly emerged as a means of communicating, collaborating, and organizing economic activity (Shultze, Hiltz, Nardi, Rennecker, & Stucky, 2008). This new environment presents an intriguing opportunity for examining leadership in virtual world teams (VWTs), or teams which collaborate via the use of avatars within virtual worlds. VWTs are similar to face-to-face teams in that work is accomplished at the same time and in the same place, albeit through collocated avatars in virtual settings. VWTs are similar to virtual teams in that communications occur through CMC, and the individuals behind the avatars are not physically collocated. Therefore, VWTs face the disruptive effects of geographical, cultural, and technology-mediated discontinuities found in virtual teams, combined with the challenges of face-to-face teams in terms of synchronous coordination.

A fast growing segment of virtual worlds is massively-multiplayer online-games (MMOGs). Daily, millions of globally-dispersed participants connect and collaborate with others by organizing themselves into VWTs of all sorts and sizes. These VWTs range from ad-hoc groups to more permanent social structures, such as player-founded organizations or guilds. While activities within MMOGs are guided by the loose structure provided by the game experience (Shultze et al., 2008), there is growing practitioner recognition that these “play” activities mirror many of the attributes of real life work (Castronova, 2005; Williams, Yee, & Caplan, 2008; Yee, 2006b). Much like in real life, leaders within MMOGS are essential to the success of the VWTs they lead (DeMarco, Lesser, & O'Driscoll, 2007; IBM, 2007; Kahai, Carroll, & Jestice, 2007; Nardi & Harris, 2006; Williams, Ducheneaut, Xiong, Zhang, Yee, & Nickell, 2006; Yee, 2006c).

There are certainly reasons to question why MMOGS, seen as a computer game to many people, represent a suitable context to study. However, exploring leadership within MMOGS may further our understanding of leadership phenomena in practical and relevant ways. First, the characteristics of the future workforce are being shaped by participation in virtual worlds. Statistics reported by K Zero indicate that the fastest growing demographic with regard to virtual

world usage is the under-25 age group, suggesting that future generations of workers are likely to be seasoned virtual world users. The experiences of these new generations may carry over to the workplace. As the borders between work, play, and learning dissolve, the demands of the virtual gaming generation are fundamentally changing how, when and where work gets done.

Therefore, understanding how leadership processes serve to motivate and coordinate members of VWTs within MMOGS is becoming increasingly important.

Second, MMOGs provide a platform to practice and experiment with leadership skills in VWTs. IBM, for example, has begun identifying employees who lead guilds within MMOGs and exploring the applicability of what these employees have learned from their virtual experiences to management practice (IBM, 2006; IBM, 2007). In all, 75% of the employees interviewed indicated that the leadership skills they learned within MMOGs have helped them in their real-world settings (Reeves, Malone, Yee, Cheng, Abecassis, Cadwell, Abbey, Scarborough, & Read, 2007). This is because unlike real life where leaders are generally more risk adverse, leaders in MMOGs are encouraged, if not outright expected, to experiment with risky and novel strategies and leadership styles to assure virtual team success. Therefore, leadership processes within MMOGs are of both academic and practitioner interest (Ives & Junglas, 2008).

Third, exploring leadership within MMOGS may shed light on how to effectively manage VWTs. In popular MMOGs such as World of Warcraft (WoW), millions of globally-distributed individuals are able to connect, communicate, and collaborate on a daily basis by using their avatars within the structure of guilds. Almost all participants in MMOGs are familiar with or belong to guilds because guilds provide a stable social backdrop for game activities. Understanding how leaders in MMOGs are able to successfully manage a heterogeneous and completely voluntary, global virtual workforce despite the discontinuities affecting team cohesion is worthwhile as questions also remain on how to effectively organize and manage large numbers of individuals in a purely CMC environment (Hertel et al., 2005; Kayworth & Leidner, 2000; Powell et al., 2004).

The position taken in this research is that the effectiveness of VWTs is predicated on the efforts of individual virtual team members, over which leaders have a great deal of influence. In essence, VWTs require effective leaders to be able to influence members to perform their job

duties well. Therefore, the research question motivating this dissertation is: *how do leaders influence member outcomes within virtual world teams?*

Drawing from the virtual teams, virtual worlds, and leadership literature, this research extends Leader-Member Exchange (LMX) theory to the VWT context. The theoretical model proposes that within VWTs, where individuals are tightly coupled together and work in a synchronous manner on highly interdependent tasks, a key undertaking of leaders is to develop high quality relationships with team members. These leader-member relationships affect 1) the degree to which team members are *allocated* resources to perform their jobs and 2) the degree to which team members *develop* resources in terms of relational capital with the team. To the extent that team members are allocated resources and develop higher levels of relational capital, their individual outcomes (i.e., performance) will be enhanced.

The goal of this research is to make the following contributions. First, this research empirically tests a theory-driven model developed to understand how leader-member relationships within VWTs affect team member performance. Second, this research adds to the small, but growing literature on leadership in VWTs. Lastly, by examining more proximal influences on VWT member performance, such as access to resources and the development of relational capital, this research aims to identify more precise causal mechanisms through which the leader-member relationship impacts member performance.

This dissertation is organized as follows. Chapter 2 provides a review of the relevant literature, presents the theory which underpins this dissertation, and builds the conceptual model. Chapter 3 presents the specific hypotheses and research model to be tested based upon the conceptual model. Chapter 4 presents the research design, measures, and analytical strategies for data collection and analysis. Chapters 5 and 6 present the empirical results and discuss the theoretical and practical implications of the findings. As how and where work is performed today has undergone fundamental shifts due to technology, this research may greatly contribute towards management practice.

CHAPTER 2

THEORETICAL FOUNDATION AND CONCEPTUAL MODEL

2.1 Overview

In order to understand VWTs, this chapter draws from the virtual team and MMOG literature. The virtual team literature suggests that effectively managing member outcomes is a complex problem in the face of discontinuities. Much less is known about leadership and VWT performance from the mostly descriptive MMOG literature. However, both the virtual team and MMOG literatures suggest that effective leadership is one way to mitigate discontinuities and improve VWT performance. Therefore, this chapter first presents a review of leadership theories to identify important gaps in current theoretical frameworks. Based upon this review, the chapter ends with the proposed theoretical model that serves as the basis for this research.

2.2 Virtual Teams

Companies have embraced work performed by virtual teams as an essential process for organizations today (Powell et al., 2004). As defined by Powell et al. (2004), virtual teams are groups of workers brought together to accomplish organizational tasks, whose members are dispersed and separated by geographic, organizational, and/or temporal barriers, and are brought together by information and telecommunication technologies. Given that technological advances have made collaboration across a variety of boundaries possible on a large scale (Constant, Sproull, & Kiesler, 1996), it is not surprising that virtual work is becoming as commonplace as face-to-face work (Martins et al., 2004; Webster & Staples, 2006). Proponents of virtual teams argue that adopting virtual teams enables a variety of organizational opportunities. For example, the ability to quickly and successfully adapt to changing conditions by leveraging knowledge from multiple sources both internally and externally, in manners unconstrained by a variety of traditional boundaries such as time zones, countries, cultures, and organizations (Hertel et al., 2005; Jarvenpaa & Leidner, 1999; Jarvenpaa & Tanriverdi, 2003; Pinsonneault & Caya, 2005).

Just as most researchers agree there are benefits associated with virtual teaming, that virtual team performance is oftentimes negatively affected by a variety of discontinuities has also been widely recognized (Jarvenpaa & Leidner, 1999; Pinsonneault & Caya, 2005; Powell et al., 2004). For example, Kayworth and Leidner (2000) observed that “virtual teams are beset with a range of challenges inherent to their dispersed and often impersonal nature.” In an integration of

prior literature, Watson-Manheim et al. (2002) proposed that discontinuities, challenges group cohesion because of geographical, temporal, cultural, and technology-mediated separation. Furthermore, whether it is a limitation of CMC technologies available or the negative effects of discontinuities, the overall findings from the virtual team literature suggest that there are idiosyncratic challenges to virtual teams that traditional teams do not face, and that work performed by virtual teams is difficult to coordinate and control, especially as the degree of virtuality increases (Dubé & Robey, 2008; Hertel et al., 2005; Martins et al., 2004; Pinsonneault & Caya, 2005; Powell et al., 2004; Webster & Staples, 2006).

Given that virtual teams are becoming increasingly important to organizations today, factors which may mitigate the negative impact of discontinuities deserve study. One factor identified which may provide insight is leadership (Avolio & Kahai, 2003; Cascio & Shurygailo, 2003). There has been some promising work thus far with regard to leadership in virtual teams. For example, based upon adaptive structuration theory (AST; DeSanctis & Poole, 1994), Avolio, Kahai, and Dodge (2001) defined virtual leadership as “a social influence process mediated by AIT [advanced information technology] to produce a change in attitudes, feelings, thinking, behavior, and/or performance with individuals, groups, and/or organizations.” Broadly, the purpose of virtual leadership is therefore to enhance the relationships between team members, which are defined by organizational structures (Avolio & Kahai, 2003).

Leading within virtual environments however, may be difficult. Just as discontinuities affect virtual team processes, discontinuities affect leaders, members, and their relationships (Gibson & Cohen, 2003; Zigurs, 2002). For example, Davis (2004) argued that distance dilutes leadership and weakens human relationships and team processes essential for team effectiveness. Also, a lack of face-to-face communication is proposed to have negative implications for leadership effectiveness, with regard to trust, building team cohesion, and the establishment of work and social norms (Hertel et al., 2005; Martins et al., 2004; Pinsonneault & Caya, 2005).

Since the literature suggests that it is so difficult for leaders to manage virtual teams, an interesting avenue of inquiry presents itself. In virtual worlds, millions of globally-dispersed participants connect and collaborate with others by organizing themselves into VWTs. These VWTs range from ad-hoc groups to more permanent social structures, for example player-founded organizations or guilds. Guilds have much in common with traditional definitions of teams, such as being guided by a common purpose, comprised of individuals with different skills

who depend heavily on each other, have shared responsibilities for outcomes, and see themselves as an intact social entity (Williams et al., 2006; Yee, 2006a). Contrary to what the virtual team literature suggests, many guilds are very successful in coordinating globally-dispersed members who are separated by geographic, temporal, and cultural discontinuities, relying solely on advanced CMC. Given the transformation towards organizations relying more on virtual teams, understanding how leaders manage VWTs has a great deal of theoretical and practical importance.

2.3 MMOGs, Guilds, and Guild Leaders

While there are many types of virtual worlds available, the largest and fastest growing segment in terms of paying subscribers is currently gaming-oriented virtual worlds. Gaming-oriented virtual worlds are also known by other labels such as massively-multiplayer online role-playing games (MMORPGs), or massively-multiplayer online games (MMOGs). For this dissertation I adopt the more generic label, MMOGs.

The number of MMOG participants has grown rapidly in the last few years. For example, Blizzard Entertainment's *World of Warcraft* (WoW) has been particularly popular, with subscriber numbers nearly doubling from 6 million in 2006 to 11.5 million in 2008 (Blizzard, 2008; Ducheneaut, Yee, Nickell, & Moore, 2006b). Just this one MMOG giant represents a revenue stream of over \$2.5 billion USD per year based on monthly user subscriptions. Software publishers have been quick to recognize the potentially lucrative revenue streams from subscription-based MMOGs as compared to traditional business models that require selling individual software titles with limited shelf life and a one-time purchase.

There are numerous other gaming-oriented virtual worlds. Based upon press releases, public financial statements, news articles, direct disclosure, and anonymous industry sources, *MMOGCHART.COM* tracks approximately 50 MMOGs with over 10,000 subscribers, of which approximately half have greater than 100,000 subscribers. Nearly all MMOGs revolve around science-fiction or fantasy elements. Partnering with companies who own intellectual property rights and storylines which lend themselves to developing a MMOG is a popular business strategy. For example, some notable offerings include *Star Wars Galaxies*, *Lord of the Rings Online*, *The Matrix Online*, *Age of Conan*, and *Dungeons and Dragons Online*. The entertainment industry has also taken notice, with large investments in the development of

upcoming MMOGS, such as *Star Trek Online*, *Marvel Universe Online*, and *Pirates of the Caribbean Online*.

Research on MMOGs is still in its infancy. Initial inquiries have been largely descriptive; for example concentrating on describing game play, demographics, business models, and social interactions (Castronova, 2005; Ducheneaut, Yee, Nickell, & Moore, 2006a; Ducheneaut et al., 2006b; Williams et al., 2008; Yee, 2006a). Other studies have addressed problematic usage, motivations to participate in MMOGs, derived experiences, emotional investment, and relationship formation (Ducheneaut, Yee, Nickell, & Moore, 2007; Yee, 2006d; Yee & Bailenson, 2007). One consistent theme that has emerged from research into MMOGs thus far has been the need for collaboration between participants in order to achieve desired outcomes (Dannecker, Richter, Lechner, Dressner, Fabisch, & Ilseemann, 2008; Nardi & Harris, 2006).

While improving one's avatar by collecting rare and powerful items, or amassing vast amounts of virtual currency are strong motivators for continued play, this cannot be accomplished by individual efforts alone (Yee, 2006a). Collaboration begins when participants realize that in order to advance their avatars, they have to cooperate rather than compete with other participants. This "forced cooperation" is part of the semi-structured nature of MMOGs due to the rules of the game. For example, during the avatar creation process, participants choose a class for their avatar. A class represents the job that one's avatar will perform and each class has its own distinct advantages and disadvantages. For example, an avatar of the warrior class is specialized in combat, whereas an avatar of the cleric class is specialized in healing. Together, the two are much more effective working cooperatively rather than going it alone. This is very much like the real world where specialization of labor entails individuals in a variety of functional areas working together in organizations. In both virtual and real life cases, there are clear benefits to cooperating and organizing with others.

The rules of the game are also meant to encourage cooperation. The best rewards usually require a collective of individuals working as a team. A rather strong motivator of play is the narrative, or storyline, provided by the game itself. For example, MMOGS often incorporate quests, or a unique task within the game wrapped around an immersive story line. Usually there is a reward associated with completing a quest and quests can be incredibly fun and engaging. Several authors have noted that in the classic Pavlovian tradition, participants are

psychologically conditioned by this quest-reward relationship, finding the derived experiences emotionally and psychologically salient (Castronova, 2005; Ducheneaut et al., 2006b; Yee, 2006a). Not only do the rewards derived from “play” activities have significant value within MMOGs, these rewards are also valuable outside of MMOGs. For example, in burgeoning secondary markets involving real money transactions (RMTs), virtual items or virtual currency are oftentimes sold for real profits by entrepreneurial-minded individuals (Castronova, 2005).

Also, the size and permanency of virtual teams formed within MMOGs may vary. For instance, ad-hoc groups may be formed where several like-minded participants get together in PUGs (pickup groups in game vernacular) for short term goals like quests. More permanent and larger teams are called guilds. Guilds may range from socially-oriented guilds to more goal-oriented guilds intent on raid activities (Williams et al., 2006). A raid is a large-scale event and requires substantial numbers of participants. For example, raid activities in the MMOG Everquest are tailored for 54 simultaneous participants. With large numbers of participants, ensuring successful accomplishment of raids is no small feat. Consider the following example:

Sir Lancelot wishes to slay the foul dragon guarding the princess who will reward him handsomely for rescuing her. However, Lancelot realizes that attempting this by himself will simply result in his own charred body. He therefore, has to recruit a valiant band of companions in order to battle this dragon. Naturally, not just anybody will do. Not only does he have to recruit a sufficient number of people to overpower the foul beast, he has to recruit the right people with the right skills for the situation at hand. The dastardly dragon is holed up in a castle with high walls and surrounded by a moat. Sir Lancelot needs engineers to build a bridge to cross the moat and to build siege weapons to scale the walls. He needs archers to keep the dragon at bay while the engineers are doing their jobs. He also needs mighty warriors who will scale the walls and actually fight the dragon. Healers to tend to the wounded and wizards to smite the dragon from afar are also needed. After an epic struggle, the dragon is slain, Sir Lancelot rescues the princess, and all is well.

If only things were so simple. Who decides on how many people or which classes to recruit? Who decides on what strategies to try in order to slay the dragon? Who monitors everyone to make sure that they are performing their assigned tasks in an effective manner? What happens if all that the princess has to offer as a reward is a single kiss – who decides how the honor, or spoils if any, should be divided among all the other people who helped? Who

organizes the next dragon slaying raid? If one were to substitute “slay the dragon” with “design a new product for sale” and product engineers and project managers for wizards and warriors, similar questions and decisions to be made remain. Indeed, “play” activities mirror real life work situations in many ways (Castronova, 2005; Ives & Junglas, 2008; Yee, 2006b). One key to a VWT’s success and the answer to the rhetorical questions posed above is leadership.

Several studies suggest that success in MMOGs is contingent upon leadership skills, such as conflict resolution, discipline, motivation, coordination, nurturing and emotional support, delegation, training, retention, recruitment, scheduling, and politicking (Castronova, 2005; Ducheneaut et al., 2006a; Ducheneaut et al., 2007; IBM, 2006; IBM, 2007; Reeves et al., 2007; Williams et al., 2006; Yee, 2006c). Utilizing the Sloan Leadership Model, Reeves et al. (2007) found that leaders in MMOGs exhibited essential skills such as sensemaking, visioning, relating, and inventing. However, understanding leadership in VWTs is still in the beginning stages and many questions remain about what characteristics and leadership styles are more effective within MMOGS.

Studying leadership within MMOGs has one major practical advantage. While there are informal communication mechanisms used within MMOGS, the vast majority of guild interactions are codified and recorded within logs, providing a unique opportunity to actually observe the leadership behaviors and coordination activities of guilds. This type of large scale, objective observation of leadership in action has been impossible in real world organizational settings. The goal of this research is to review the extensive literature base on leadership, from which to build a testable model of leadership processes applicable to VWTs.

Even though virtual teams are one of the crucial building blocks for organizations today, how leaders faced with discontinuities may influence virtual team performance is unclear. It is the position of this research that studying leadership in VWTs offers an intriguing context in which to further our understanding of leadership processes within virtual environments. As overall VWT performance is predicated upon individual VWT member performance, this research aims to address the following question: *how do leaders influence member outcomes within virtual world teams?*

2.4 Leadership Paradigms

*"Some are born great,
some achieve greatness,
and some have greatness thrust upon them"*
Shakespeare, *Twelfth Night*

*"Of all the hazy and confounding areas in social
psychology, leadership theory undoubtedly
contends for the top nomination. And, ironically,
probably more has been written and less known
about leadership than any other topic in the
behavioral sciences." (Bennis, 1959)*

While the concept of leadership is not new, scholarly research into the area is a relatively new undertaking of the last century. In this short period of time, the broad area of leadership has seen a great deal of academic interest, for example Bass (1990) lists over 3,000 leadership-related studies conducted since the early 1930's. Moreover, within organizational studies, leadership is recognized as one of the most studied topics (Yukl, 1994). However, a consensus on the facets of leadership has been difficult to achieve with Stogdill (1974) observing that "there are almost as many definitions of leadership as those who have attempted to define the concept." While challenges exist in trying to understand such a complex and multifaceted phenomena, there is one unifying commonality - "still we persist in trying to explain the key question: What makes an effective leader?" (Van Seters & Field, 1990).

Broadly, leadership research may be categorized into several paradigms. These paradigms and the theories encompassed within have continually evolved in response to the changing times, theoretical shortcomings, and criticisms leveled (for comprehensive reviews of leadership research see Bass, 1990; House & Aditya, 1997; Yukl, 1994). Researchers in each paradigm have sought to answer the "what makes an effective leader" question in a variety of ways. For the purposes of this dissertation, I begin by briefly reviewing the major leadership paradigms: trait, behavioral, contingency, and charismatic. By exploring how leadership theories have developed, what has been learned, and the criticisms of each paradigm, I introduce Leader-Member Exchange (LMX) theory, and propose why it underpins this dissertation.

2.4.1 The Trait Paradigm

The earliest paradigm, the leadership trait paradigm (1930s - 1950s, 1970s - present; House & Aditya, 1997) seeks to identify personality characteristics or traits related to effective leadership. The trait paradigm's answer to the effective leader question would be, "it is who the leader is." For example, researchers sought out great men (and some women), studied them for personalities or traits which made them effective leaders, with the hopes that attributes which could be emulated by other managers could be prescribed (Stogdill, 1948; Stogdill, 1974).

Unfortunately, criticisms of trait research include poor generalizability, limited replicability, and validity issues due to poor psychometric properties and varying operationalizations of the same constructs (House & Aditya, 1997). To compound matters, very few traits were found to be universally significant – Jenkins (1947) found none while Lord, Devader, and Alliger (1986) found only three significant traits (intelligence, dominance, and masculinity) in their meta-analyses. Other possibly noteworthy traits include achieve motivation, flexibility, and self-confidence (House & Aditya, 1997). Like a house of cards, the key assumption that personalities or traits which had been identified could be subsequently trained has been questioned (Van Seters & Field, 1990). For example, other trait-based research such as the Minnesota Twin studies indicates that genetics plays a role in individual dispositions, lending support for the notion that perhaps some leadership traits are inherited, and presumably, not trainable (Bouchard, Lykken, McGue, Segal, & Tellegen, 1990).

This is not to say that little has been learned. While many scholars have been quick to write-off trait-based leadership research as interest in it waxes and (mostly) wanes, the role of personality and traits has been fruitfully incorporated into the leadership tradition. For example, some traits have been meaningfully integrated as explanatory antecedents into later theories in other leadership paradigms such as House's (1977) theory of charismatic leadership and Fiedler's (1967) contingency theory of leadership.

2.4.2 The Behavioral Paradigm

Given the disappointing results from the personality and trait paradigm, researchers sought next to study effective leadership behaviors (1950s - 1980s; House & Aditya, 1997). The behavioral paradigm's answer to the effective leadership question would therefore be, "it is what the leader does." However, the behavioral paradigm shares some of same assumptions which drove the leadership trait paradigm. Researchers observed leadership behaviors within lab environments or in the field and looked for universal behaviors or leadership styles, which they hoped would predict effective leadership (Van Breukelen, Schyns, & Le Blanc, 2006). Extensive research was conducted at top universities with research groups at Harvard, the University of Michigan, and notably the Ohio State Leadership Center (House & Aditya, 1997).

While some criticisms of this paradigm include the overuse (and assumedly poor generalizability) of using students in lab studies, some are more serious. For example, much like the trait paradigm which preceded, instrument, psychometric, and validity issues continued.

Also, the few field studies conducted were based almost exclusively on data collected from individuals who functioned at lower levels of the organization with research designs that depended heavily on subjects' recall ability (House & Aditya, 1997). Predominantly an inductive and atheoretical approach, it is not surprising that "this quest did not result in the identification of a list of universally critical behaviors." (Van Breukelen et al., 2006)

Research into leader behaviors did however, bear some fruit. For example, the Ohio State and Michigan studies identified two important leader behaviors which have been extremely influential: consideration and initiating structure (Stogdill & Coons, 1957). Indeed, many subsequent leadership theories, at least on a conceptual level, have much in similar to these dimensions. While this line of research has fallen out of favor, a recent meta-analysis suggests abandonment may be premature, with much still to be learned (Judge, Piccolo, & Ilies, 2004). A third dimension to complement consideration and initiating structure, individual prominence, which was identified by Harvard researchers studying emergent leaders, has been mostly ignored (House & Aditya, 1997); although the power basis of this dimension has been explored in different manners (e.g., French & Raven, 1959).

A major contribution of this paradigm has been the identification of certain beneficial types of leader behaviors as classified by the consideration and initiating structure dimensions. Prominent behaviors identified include task-oriented, person-oriented, change-oriented, and more recently, relationship-oriented behaviors (Dienesch & Liden, 1986; House & Aditya, 1997; Van Breukelen et al., 2006). While some of these behaviors proved to be effective, once again researchers were stymied in their efforts to universally prescribe which ones of these behaviors predicted effective leadership. House and Aditya (1997) propose that this was due to neglecting the "specific role demands of leaders, the context in which they functioned, or differences in dispositions of leaders or followers."

2.4.3 The Contingency Paradigm

As a result of the disappointing overall results from the trait and behavioral paradigms, the contingency paradigm developed. Proponents of this paradigm argue that while leader traits and behaviors are important, these must be optimally matched with the variety of situations with which leaders are faced. Some examples of important factors to match include the status and power of leaders and followers, their personal characteristics (such as knowledge, skills, and abilities), the task complexity, and the constraints imposed by external environments (Van

Breukelen et al., 2006; Van Seters & Field, 1990). Therefore, effective leaders are ones whom adapt their behaviors to match the situation at hand (Hunt & Larson, 1974). A major contribution of the contingency paradigm has been to recognize that leadership is not always solely about the leader. Instead of concentrating solely on the leader, recognizing that leaders, followers, and situations are all important in explaining leadership represented a new step in leadership theorizing (Van Seters & Field, 1990).

Influential theories of this paradigm which seek to explain how and what leaders should do include the contingency theory of leadership (Fiedler, 1967) and the path-goal theory of leadership effectiveness (House, 1971; House & Mitchell, 1974). These theories have been further refined, for example into the cognitive resource theory of leadership (Fiedler & Garcia, 1987) and the theory of charismatic leadership (House, 1977), both of which enjoy a great deal of empirical support (House & Aditya, 1997). Qualitatively however, it is easy to see how difficult it would be to account for every possible contingency or situation facing leaders, much less effectively training managers to adapt. Later theoretical iterations also lack parsimony, for example Vroom and Jago (1988) incorporated twelve decision rules, twelve problem attributes, and eight problem types for four desired outcomes at the individual and group level into a decision tree.

It is therefore not surprising that Van Seters and Field (1990) remarked that “many (theories) are too cumbersome for systematic use in day-to-day managerial activities though there is a computer program to aid the use of the Vroom-Jago theory.” Given that the contingency paradigm’s answer to the effective leadership question, “it depends”, is decidedly academic, it is not surprising that other leadership paradigms have developed in parallel (House & Aditya, 1997; Van Breukelen et al., 2006).

2.4.4 The Charismatic Paradigm

A major paradigm that developed at approximately the same time frame as the contingency paradigm (1977 - present; Shamir, House, & Arthur, 1993) is actually an amalgamation of several related theories. Whether labeled as the transformational era (Van Seters & Field, 1990) or the neocharismatic paradigm (House & Aditya, 1997), prominent theories include charismatic leadership (House, 1977), the attributional theory of charismatic leadership (Conger & Kanungo, 1987), transformational leadership (Bass, 1985; Burns, 1978), and visionary leadership (Nanus, 1992; Sashkin, 1988).

These theories share several commonalities. First, they attempt to explain how some leaders succeed in spite of what seems like overwhelming odds. Second, they stress how leaders may inspire their followers to extraordinary levels, usually by inspiring, achieving consensus, and setting goals for collective action. Third, they prescribe leader behaviors which are conducive to achieving follower buy-in and transformation (Shamir et al., 1993). Naturally, what each theory prescribes in terms of the focal variables and impacts which leadership has on followers' attitudes and behaviors differs (House & Shamir, 1993). Yet, with regards to the effective leader question, "all of them share the common perspective that effective leaders transform or change the basic values, beliefs, and attitudes of followers so that they are willing to perform beyond the minimum levels specified by the organization." (Podsakoff, MacKenzie, Moorman, & Fetter, 1990)

Collectively, the findings across charismatic, transformational, and visionary leadership show remarkable convergence, in that empirical findings support the theorized leader behaviors and proposed effects (House, Shamir, Smith, & Spangler, 1991; Shamir et al., 1993). These relationships have been explored empirically at multiple units of analysis (individual, dyadic, workgroup, organization), in both field and lab settings, at different levels of the organization (low to high-level employees including CEOs and presidents), in different types of organizations and organizational environments, across cultures, and employing a variety of quantitative and qualitative techniques (House & Aditya, 1997; House et al., 1991; Shamir et al., 1993; Van Breukelen et al., 2006; Van Seters & Field, 1990). In a meta-analysis of correlations between leader charisma and followers' ratings of leader effectiveness, Lowe, Kroeck and Sivasubramaniam (1996) found a fairly high correlation of 0.81. In addition, leaders who display charismatic behaviors tend to be also viewed as effective by their superiors and have a positive impact on their followers' levels of satisfaction, performance, and organizational citizenship behaviors (Podsakoff et al., 1990; Shamir et al., 1993).

The refinement of core theories has also continued. For example, in response to criticisms of early charismatic theories treating the process by which charismatic outcomes are achieved as a black box, Shamir et al. (1993) proposed a model incorporating elements of social cognitive theory (Bandura, 1986), identity theory (Stryker, 1980), and social identity theory (Ashforth & Mael, 1989). Their model suggests that charismatic leaders motivate their followers by elevating their followers' self-concepts. These self-concepts are held both at the individual

and collective levels, and include self-esteem, self-efficacy, collective efficacy, personal identification with leader, social identification, and value internalization. In their summary of this paradigm, House and Aditya (1997) remarked that “this genre of leadership results in a high-level of follower motivation and commitment and well-above-average organizational performance, especially under conditions of crisis or uncertainty.

A major criticism of these charismatic theories has been that charismatic leadership may not always result in positive organizational outcomes. For example, the “Hitler effect” in which charismatic leaders have (mis)lead followers with horrific outcomes is often cited. Shamir et al. (1993) caution that “the risks involved in following charismatic leaders are at least as large as the promises.” Therefore, they further note that followers have a responsibility to be aware of their choices of leaders and personal actions.

Another major criticism by some scholars has been that the charismatic leadership paradigm has overstated the role of the leaders when it comes to organizational outcomes. Proponents of this line of criticism argue that leaders oftentimes are symbolic in nature with very little true control over situations and/or outcomes. Therefore, charismatic leadership theories over-romanticize and over-emphasize the wrong ideas, and instead promote unrealistic “heroic” stereotypes (Beyer, 1999; Yukl, 1998). One interesting view that has emerged in response to this criticism is the follower perspective articulated by Howell and Shamir (2005). Acknowledging that prior work has been overly leader-centric, Howell and Shamir (2005) argue that “leaders and followers both play an active role in shaping their mutual relationships, and therefore in shaping organizational outcomes.” To date, the propositions they suggested and research focusing on the role of followers have received little attention.

2.4.5 Summary of Leadership Paradigms

Table 1 provides a summary of the four leadership paradigms reviewed thus far. Each paradigm has shed some light on the nature of leadership. From the trait paradigm, we understand that leaders (and to the same extent, followers) are individuals comprised of a bundle of attributes. While not universally useful in terms of predicting effective leadership, these traits do have an effect on individual behavior and should not be discounted out of hand. From the behavioral paradigm, we understand that certain leadership behaviors do have an impact on outcomes. Therefore, unlike more drastic viewpoints which hold that leaders do not matter much (e.g., Meindl, 1990; Meindl, 1995), there is evidence to suggest that leaders are important to

consider. Certainly, understanding what actions, and under what conditions these actions are optimal, is a key prescription of any contemporary leadership theory.

Due to the lack of support for universalistic traits and behaviors, the idea that situations mattered led to the emergence of the contingency paradigm. Understanding that flexibility is a part of effective leadership, and that leaders must consider the situations they face and tailor their responses accordingly, has been one key lesson. More importantly, the contingency paradigm began the debate that leadership studies should not just examine the leader, but include other domains of interest (e.g. followers). The charismatic paradigm holds much promise for leadership theories (Van Seters & Field, 1990). Charismatic theories extend our knowledge of leadership by proposing that leaders transform their followers' attitudes. Also, these attitudes may exist at both the individual and collective levels. The transformation of these attitudes can have significant (and as discussed earlier, both positive and negative) impacts on performance. While these paradigms represent a significant amount of knowledge, Table 1 suggests that there are certain limitations to each. The first limitation is that all four of the paradigms reviewed share one basic assumption. This assumption holds that leaders should adopt one consistent manner or style by which they deal with followers. This consistent style is commonly called the "average leadership style" (ALS). Any deviations on the perceptions of a leader by their followers are attributed to individual errors or measurement error (Van Breukelen et al., 2006). For example, and at the risk of oversimplification, for the trait paradigm, a leader would always be positive with their followers. For the behavioral and charismatic paradigms, a leader would always be task-oriented or charismatic. The leadership style selected would be consistent across all their followers. Even the contingency paradigm which holds that there is not always one correct leadership style is caught in a minor tautology – the correct leadership style for all followers would depend on the situation, after which an ALS approach is adopted. Given the inflexibility of this "one-style-fits-all" assumption, clearly there is a need to consider other leadership alternatives.

Second, while what we know from the contingency paradigm suggests that leadership inquiries need to consider multiple domains, the trait, behavioral, and charismatic paradigms are for the most part, leader-centric (House & Aditya, 1997; Howell & Shamir, 2005). Just as the saying goes that there are too many Chiefs and not enough Indians, it may also be observed that without Indians there would be no chiefs. Hollander (1993) also succinctly notes that "without

followers, there are plainly no leaders or leadership.” This suggests that to further our understanding of leadership, research must progress past treating leaders and followers as unidirectionally related exogenous and endogenous variables. One theory which examines leadership outside the ALS approach and considers both leader and members’ perspectives is LMX theory.

2.5 Leader-Member Exchange Theory

At its core, LMX theory is about relationships; specifically relationships between leaders and their followers (Dansereau, Graen, & Haga, 1975; Dienesch & Liden, 1986; Graen & Cashman, 1975; Graen & Scandura, 1987; Graen & Uhl-Bien, 1995). As organizations rely on individuals working together to function, ignoring that relationships develop between individuals and that these relationships have impacts on important organizational outcomes would be unwise (Nahapiet & Ghoshal, 1998; Uhl-Bien, Graen, & Scandura, 2000). LMX theory also recognizes the significant contributions and influence which followers have in the leader-member relationship.

For example, the labels “followers” and “subordinates” have been replaced by the label “members”. This evolution represents the goal of developing high quality leader-member relationships, in which members work with and not for, leaders (Graen & Uhl-Bien, 1995). Also, LMX theory holds that instead of behaving in the same manner towards all of their followers, leaders behave towards and allocate resources differently to members of their workgroup based upon unique dyadic leader-member relationships (Dansereau et al., 1975; Uhl-Bien et al., 2000). Earlier literature which sought to validate this proposition found that oftentimes due to time, resource, or cognitive pressures, leaders sometimes only form close relationships with a few key subordinates (Dienesch & Liden, 1986; Graen, 1976).

There is growing recognition that these differential relationships exist and have important implications for management practice and leadership studies. In particular, high quality leader-member relationships are desirable as they have been found to be *positively* related with a large number of variables of organizational interest including member attitudes, behaviors, and outcomes (Gerstner & Day, 1997; Graen & Uhl-Bien, 1995; Schriesheim, Castro, & Cogliser, 1999). Therefore, if leadership describes the degree to which leaders are able to influence

Table 1: A Summary of Leadership Paradigms

Paradigm	Domain of Interest	Effective Leader Question	Findings	Limitations and Criticisms
Trait	Leader	"It is who the leader is"	Few, if any universal effective traits. Some traits have been incorporated as antecedents into theories in other paradigms.	Atheoretical approach. Leader-focused. Average Leader Style. Validity issues.
Behavioral	Leader	"It is what the leader does"	Few, if any universal effective behaviors. Constructs such as initiating structure and consideration have contributed greatly to our understanding of leadership behaviors. Identified useful categories of behaviors (i.e. change-oriented, task-oriented, etc).	Atheoretical approach. Leader-focused. Average Leader Style. Validity issues.
Contingency	Leader, Follower, Situation	"It depends"	Many prescriptions for a variety of situations. Contingency theory has been used in a variety of other disciplines. Recognized the multidimensionality of leadership.	Empirical studies are still leader-focused. Average Leader Style. May lack parsimony.
Charismatic	Leader	"It is the ability of the leader to transform followers' attitudes"	Transforming follower attitudes and achieving "buy-in" to something larger than themselves can have positive impacts. At the individual level effective leaders should empower and intrinsically motivate followers while adjusting follower goal and reward valences. Often attitude transformation occurs at the collective level (i.e. organizational identification and commitment) and enhances collective action.	Extremely leader-focused. Average Leader Style. May be contingent on situation (e.g., charismatic leaders are especially effective in crisis and stressful situations). May encourage "blind devotion" from followers.

subordinates towards performing a common goal, LMX theory suggests that high quality leader-member relationships are essential to influencing positive member outcomes.

As it is important to demarcate the boundaries around what this dissertation seeks to explore, there is a need to synthesize what we know based upon the hundreds of studies of LMX-related research in the last thirty years. This literature review is broken into three categories building on the stage-model proposed by Graen and Uhl-Bien (1995). Studies in category one represent the beginnings of LMX theory and seek to validate the existence of differential relationships. Studies in category two focus on developing the nomological network around the LMX construct by 1) examining antecedents and determinants of LMX, and 2) relating LMX to a variety of work outcomes. In category three, Graen and Uhl-Bien (1995) introduce the Leadership-Making model, in which they propose that training leaders to develop high quality leader-member relationships can have organizational benefits.

2.5.1 Category One

This category is focused heavily on the initial assumptions, theoretical evolution of LMX theory, and the validation of differentiated work relationships between leaders and members. LMX theory has roots in social exchange theory, role theory, and Vertical Dyad Linkage (Dansereau et al., 1975; Dienesch & Liden, 1986; Graen & Uhl-Bien, 1995; House & Aditya, 1997). Initial LMX work concentrated heavily on using these bases to explore how LMX relationships develop (e.g., Dienesch & Liden, 1986; Liden, Wayne, & Stillwell, 1993). For example, notable conceptual works include the process model which describes the development of LMX by Dienesch and Liden (1986). Their model suggests that the personal characteristics of leaders and members and their attributions of the outcomes of delegated interactions, affect the nature of exchange between leaders and members.

For example, leaders develop high quality relationships with members with whom they have had successful interactions in the past based upon continuing work or social interactions and exchanges. These members are considered part of the “in-group” and enjoy higher levels of trust, support, and formal and informal rewards (Dienesch & Liden, 1986; Graen & Scandura, 1987). As a result, these members are offered opportunities not available to others, such as more important organizational roles (Harris, 2004). In order to maintain a balanced exchange relationship, employees reciprocate by adopting attitudes and behaviors which reflect the support derived from the leader-member relationship. Therefore, increased levels of supervisorial

support have a positive impact on members' performance because the norms of reciprocity influence members to perform above and beyond normal job expectations (Wayne, Shore, & Liden, 1997).

The opposite also holds - members who have an ineffective working relationship with their leaders, or the "out-group", receive none of the additional benefits afforded to the "in-group". Sometimes characterized as "hired hands", members of the out-group are managed almost exclusively by what is denoted in the formal employment contract, and the influence leaders have on their members is diminished (Dansereau et al., 1975; Graen & Uhl-Bien, 1995). Naturally, these members are not expected to perform as well as the "in-group" given the lesser support provided and lower expectations held of the exchange relationship. Based upon their literature review, Uhl-Bien et al. (2000) further suggest this is because low quality relationships may negatively impact member motivation, effective communications between leaders and members, and reduced resources such as training and development opportunities.

While the above descriptions of the leader-member relationship rely on the "in-group" "out-group" designations, one recent and important theoretical refinement has been to move beyond this dichotomous distinction, and to operationalize the relationship on a continuum (Dienesch & Liden, 1986; Schriesheim et al., 1999). Also, while these relationships may change over time, in general they develop fairly quickly and remain stable (Graen & Cashman, 1975; Liden & Graen, 1980). Overall, the major contribution of studies in category one has been to posit and validate that the quality of leader-member relationships vary.

2.5.2 Category Two

According to Graen and Uhl-Bien (1995), category two of LMX research focuses on two main streams; 1) studies which seek to explain the formation of the leader-member relationship and 2) studies which explore the impacts of the leader-member relationship on organizational outcomes. Studies in the first stream include both conceptual and empirical works and seek to define the antecedents, determinants, and moderators of differentiated relationships. The first stream has expanded the nomological network around the LMX construct. For instance, studies have examined behaviors such as the frequency of communication and communication patterns of dyads, influence tactics, and identified many antecedents of LMX like trust, demographic and personality similarities between leaders and members, affect, and past performance (Dienesch & Liden, 1986; Gerstner & Day, 1997; Graen & Uhl-Bien, 1995; Schriesheim et al., 1999).

While the first stream has concentrated mainly on determinants and antecedents of LMX, the second stream seeks to understand the outcomes, or the impact of LMX on variables of organizational interest. A large body of literature investigating an equally large number of outcomes exists (Gerstner & Day, 1997). For example, LMX has been shown to be positively related to objective and subjective performance, satisfaction with supervision, overall satisfaction, job satisfaction, organizational commitment, role clarity, member competence, intentions to stay, innovation, career progress, employee empowerment, and procedural and distributive justice perceptions. LMX may also mitigate certain undesirable outcomes such as turnover intentions, role conflict and ambiguity, and job problems (Gerstner & Day, 1997; for detailed citations see Graen & Uhl-Bien, 1995; Van Breukelen et al., 2006). Overall, the findings from category two suggest that the leader-member relationship is important to consider because of its' positive influence on these important member outcomes.

2.5.3 Category Three

Based upon the overall findings of research in category 2, there is strong support for the positive impacts that a high quality leader-member relationship has on a variety of member outcomes. However, research in the first two categories held the common assumption that relationships between leaders and followers developed in situ as a result of constraints on the part of either the leader or member. Therefore researchers treated the formation of the LMX relationship as a given, and the majority of studies were descriptive in nature seeking to describe the outcomes of these existing relationships. As a response to this assumption, Graen and Uhl-Bien (1995) prescribed their alternative Leadership-Making model and suggested this model should be the focus of category three in LMX research.

In the Leadership-Making Model, the goal of managers should be to progress relationships with their subordinates through three successive phases: strangers, acquaintances, and partners. While these authors acknowledge that not all relationships will progress to the partnership phase, a clearly stated goal (and divergence from prior literature) is that managers should attempt to build mature partnership relationships with *all* their subordinates. This is because high quality leader-member relationships, such as partnerships, are based upon high levels of mutual reciprocal influence, such as mutual trust, respect, and obligation. It is through these strong ties, in which members grow beyond simply fulfilling what is stated in their job descriptions, that effective leadership processes are enabled.

There is some initial support for the Leadership-Making Model. Researchers noted that when leaders were trained to develop high quality partnerships with all their subordinates, subordinate performance was greatly increased. Furthermore, as the proportion of high quality leader-member relationships increased, the overall unit performance also increased (Graen, Novak, & Sommerkamp, 1982; Graen, Scandura, & Graen, 1986; Scandura & Graen, 1984). Collectively, categories one through three suggest that when it comes to influencing member outcomes, the quality of the leader-member relationship is an important consideration. In particular, leaders should strive to improve the leader-member relationship quality with members, as this provides a strong opportunity for leadership influence to be exerted.

2.6 Leader-Member Relationships

The quality of the leader-member relationship, as measured by the LMX construct, is at the heart of LMX theory. LMX theory holds that leadership consists of multiple domains and explicitly recognizes three: leader, follower, and relationship, where focusing on the relationship domain is a clear goal of LMX proponents (Graen & Uhl-Bien, 1995). It is important to note that unlike other leader-centric theories, LMX theory holds that relationships are not always top-down, for instance, unidirectional from leader to member. Leader-member relationships include the perceptions of members, as members may negotiate their roles with leaders (Graen & Cashman, 1975). Mutual attitudes such as perceived contribution, loyalty, and affect are “currencies of exchange” which both parties bring (Dienesch & Liden, 1986), and the perceptions that leaders hold of members can be affected by influence tactics (Wayne & Ferris, 1990; Wayne & Liden, 1995). Therefore, the quality of the leader-member relationship is affected by both parties and the perceptions of the relationship from both the leader and member perspectives are equally important (Gerstner & Day, 1997).

Unfortunately, while research guided by LMX theory has advanced our understanding of leadership, what dimensions underlie the leader-member relationship and how to measure LMX has been the subject of much debate. Over twenty-five years after the foundational pieces which underpin LMX were published, Gerstner and Day (1997) (in)famously noted that “there is surprisingly little agreement on what LMX is” while House and Aditya (1997) surmised that “as a theory, LMX is still developing.” In a more recent review piece, Van Breukelen et al. (2006) were decidedly less kind and remarked that “there is a lack of clarity on what constitutes the dimensions or components of the leader–member working relationship itself, what are the

antecedents or correlates of a low or high quality relationship, and, finally, what are its consequences.” There are numerous calls for refining the theorizing, dimensions, measurement, antecedents and outcomes, and processes through which LMX relationships develop (Dienesch & Liden, 1986; Graen & Uhl-Bien, 1995; Liden & Maslyn, 1998; Schriesheim et al., 1999; Schriesheim, Neider, Scandura, & Tepper, 1992).

A large debate remains regarding the dimensions which underlie the LMX construct. Recent meta-analytic and review pieces (e.g., Gerstner & Day, 1997; Graen & Uhl-Bien, 1995) suggest that while LMX may have several underlying dimensions, these dimensions are so overly correlated as to form one uni-dimensional construct and recommend the use of the reliable uni-dimensional LMX-7 instrument (Graen et al., 1982). Other LMX researchers, such as Dienesch, Liden, Schriesheim, and colleagues, disagree and have offered their own instruments. Therefore, there are numerous uni and multi-dimensional instruments available to measure LMX, with underlying dimensions such as loyalty, affect, and contributions (Dienesch & Liden, 1986), loyalty, affect, contributions, and professional respect (Liden & Maslyn, 1998), mutual trust, respect, and obligation (Graen & Uhl-Bien, 1995), trust, liking, latitude, support, attention, and loyalty (Schriesheim et al., 1999), perceived contribution, loyalty, and positive affect (Schriesheim et al., 1992).

While there is substantial debate over the theoretical dimensions associated with LMX (for further discussion please see Ferris, Liden, Munyon, Summers, Basik, & Buckley, 2009; Schriesheim et al., 1999), ultimately what is clear is that a key tenant of LMX theory is the focus on the relationship between leaders and members. This dyadic and reciprocal relationship differentiates LMX from other leadership research streams (Gerstner & Day, 1997; Liden & Maslyn, 1998; Schriesheim et al., 1999; Van Breukelen et al., 2006). Most important, the quality of the leader-member relationship is proposed to be more predictive of individual and organizational outcomes than leader traits or behaviors (Graen & Uhl-Bien, 1995; House & Aditya, 1997). Therefore, leaders should focus on building high quality relationships with their subordinates to influence member performance.

2.7 Member Outcomes

As reviewed earlier in category two of LMX research, a large body of literature has posited and tested relationships between LMX and a large number of variables of organizational interest. In their seminal meta-analysis piece, Gerstner and Day (1997) reviewed many studies

examining outcomes of interest to organizations such as performance ratings, objective performance, overall satisfaction and satisfaction with supervision, organizational conflict, role conflict and clarity, turnover and turnover intentions, and member competence. There is strong support for the overall positive influences that high quality relationships enable.

However, what is not entirely clear from this body of literature are the exact causal mechanisms by which LMX influences these member outcomes. While there are over 100 articles in the review pieces cited just above, the majority have been “LMX plus” studies which seek to relate LMX to organizational variables by utilizing research designs employing correlational analyses which fail to properly explain the theoretical underpinnings underlying the leader-member relationship or the choice of outcome variables (Schriesheim et al., 1999). Clearly, there remains room for work which addresses two main gaps. First, there is a need to study more proximal mediators of the leader-member relationship to member outcomes in order to address - *how* leader-member relationship affects member performance. Also, in order to build on what we already know from this body of literature, there remains a need for a more systematic and conceptual integration of the myriad of constructs from prior studies. Therefore, a key contribution of this dissertation is the following theoretical derivation of a causal model of LMX in VWTs.

2.8 Leader-Member Relationships and Allocation of Resources

A key responsibility of leaders is to provide subordinates with the resources necessary to perform their job functions (Graen & Uhl-Bien, 1995; Van Breukelen et al., 2006; Yukl, 1998). Therefore, as informed by LMX theory, it is the position of this research that the leader-member relationship impacts the allocation of resources to members. Resources may be either tangible (e.g. job assignments, financial rewards) or intangible and perceived (e.g., employee empowerment, latitude, communication, access to information). According to LMX theory and many of the studies reviewed under category one, members who have low quality leader-member relationships are accorded a minimal level of resources to get their jobs done. Oftentimes, the support these members receive is merely what the formal employment contract specifies (Schriesheim et al., 1999).

On the other hand, in high quality leader-member relationships, members are accorded a greater deal of resources stemming from their relationship with their leader. According to the Leadership-Making Model, “emphasis is placed not on how managers **discriminate** among their

people but rather on how they may **work with** each person on a one-on-one basis to develop a partnership with them” (Graen & Uhl-Bien, 1995). Relationships which have reached the “mature partnership” phase are characterized by high degrees of mutual respect, trust, and obligation and reciprocity, thereby providing greater access to resources by both parties. For example, members may gain access to the resources present in the leader’s network and leaders are more apt to support individuals with whom they have a strong relationship with, especially when there is a strong emotional bond between parties (Graen et al., 1982; Graen & Uhl-Bien, 1995; Schriesheim et al., 1999). Therefore, the quality of the leader-member relationship directly impacts the resources allocated to members.

2.9 Leader-Member Relationships and Development of Resources

Leader-member relationships can also influence the development of resources by members. The Leadership-Making model (Graen & Uhl-Bien, 1995) suggests that LMX theory has much in common with transactional and transformational leadership theories (Bass, 1990; Burns, 1978). Specifically, Graen and Uhl-Bien (1995) integrated these theories and argued that the stranger and partner phases of the Leadership-Making model are analogous to the descriptions of transactional and transformational leadership. For example transactional leadership behaviors represent “management-by-exception” or “contingent reward” styles and focus on activities such as performance monitoring and emphasize corrective rather than developmental actions (Sivasubramaniam, Murry, Avolio, & Jung, 2002). Conceptually, these behaviors are analogous to the “role-taking” process, where relationships are constrained to formally define organizational roles. Thus, transactional leadership behaviors are not expected to lead to higher quality leader-member relationships and individuals remain strangers (Graen & Uhl-Bien, 1995; Uhl-Bien et al., 2000).

On the other hand, leader-member relationships which advance to the partnership stage “experience a transformation from self-interest to a larger interest” (Graen & Uhl-Bien, 1995). This transformation occurs due to three reasons. First, transformational leaders exhibit specific behaviors to encourage followers to buy-in to collective goals in order to achieve extraordinary goals (Antonakis, Avolio, & Sivasubramaniam, 2003). For example, transformational leaders exemplify core beliefs and ethics, communicate achievable goals and an optimistic future, and instill the of value higher-order ideals (Antonakis et al., 2003). These behaviors form the basis of the “role-making” process in LMX theory by which high quality leader-member relationships

are developed (Graen & Uhl-Bien, 1995). Second, a high quality leader-member relationship, facilitated by high levels of mutual trust, respect, and obligation may be viewed as a source of influence (Schriesheim et al., 1999; Van Breukelen et al., 2006). Not only must higher-order ideals be transmitted through the relationship, but influence is necessary to achieve member buy-in. Third, these ideals are internalized by members in two ways 1) by a social exchange mechanism in which members feel obligated to reciprocate the support received from the relationship by adopting the same beliefs and goals as the leader (Wayne et al., 1997) or 2) as a result of when leaders successfully tie group efforts to the collective identity of the group (Shamir et al., 1993).

One way to understand the impact of this transformation and subsequent buy-in to a collective ideal is to examine relational capital (Uhl-Bien et al., 2000). As a form of social capital, relational capital refers to “assets created and leveraged through relationships” (Nahapiet & Ghoshal, 1998). Similar to LMX, relational capital is developed by repeated interactions between individuals. As an intangible resource, relational capital consists of four dimensions: trust, obligations, norms, and identification. Therefore, by the mechanisms discussed above, high quality leader-member relationships encourage members to develop their own resources in the form of relational capital based on high levels of trust, obligation, and identification with the team, while being more aware of that team’s norms.

In summary, it is the position of this research that the quality of the leader-member relationship has an influence on the allocation of resources to members and development of resources by members in the form of relational capital. Understanding this is important because resources have a direct impact on member outcomes. For example, the allocation of resources is important because it stands to reason that the greater the resources allocated, the better the outcomes for members. This is because resources such as better job assignments, higher levels of support, greater access to information, more frequent communications, and more job latitude have a direct impact on a members’ effectiveness (Graen & Uhl-Bien, 1995; Schriesheim et al., 1999; Van Breukelen et al., 2006).

The transformation of members’ self interest into relational capital, or the degree to which individuals develop stronger ties with the team, also has important impacts on member outcomes. For example, this transformation motivates followers to perform above and beyond the norms expected (Purvanova & Bono, 2009). Additionally, as high quality relationships are

characterized by high levels of mutual trust, obligation, and reciprocity, members work harder rather than being guided by material exchanges or self-interest (Graen & Uhl-Bien, 1995; Schriesheim et al., 1999). Therefore, the degree to which a member is allocated and develops resources has an impact on their outcomes.

2.10 Conceptual Model

Based upon the above discussions, the following conceptual model is developed and presented in figure 1. This conceptual model is grounded and guided by LMX theory. First, high quality leader-member relationships have important, indirect impacts on member outcomes. This is because high quality leader-member relationships are characterized by high degrees of mutual influence (Graen & Uhl-Bien, 1995), which impacts the allocation and development of member resources. Specifically, high quality relationships provide members with access to both tangible and intangible resources by which to perform their jobs and enable the development of member resources in terms of relational capital with the collective. Lastly, it is through higher allocation and development of resources by which members achieve better outcomes.

Therefore, with regards to VWTs, this research proposes that high quality leader-member relationships affect 1) the degree to which VWT members are allocated resources to perform their jobs and 2) the degree to which VWT members develop relational capital with the VWT. To the extent that VWT members are allocated resources and develop higher levels of relational capital, their individual outcomes (i.e., performance) will be enhanced.

Figure 1: Conceptual Model

CHAPTER 3

RESEARCH MODEL AND HYPOTHESES

3.1 Overview

According to LMX theory, the leader-member relationship is integral to positive member outcomes. However, the exact causal mechanisms between leader-member relationships and member outcomes are not entirely clear, especially when looking at VWTs. The purpose of this chapter is to present formal hypotheses, based upon LMX theory, that explain how the leader-member relationship affects access to and the development of VWT member resources. Furthermore, greater access and development of resources are hypothesized to result in more positive member outcomes, namely performance. This chapter presents the research model and hypotheses to be tested, based on the conceptual model presented in chapter 2.

3.2 Leader-Member Relationships and the Allocation of Resources in VWTs

As discussed in Chapter 2, LMX theory suggests that differential leader-member relationships impact the resources which members are allocated. Members who develop high quality leader-member relationships with their leaders gain greater access to resources. LMX theory suggests several reasons for this. High quality leader-member relationships are the result of a series of positive social and work-related exchanges (Liden et al., 1993). Through successful exchanges, the leader and member become increasingly interdependent and their relationship is characterized by higher levels of mutual trust, obligation, reciprocity, and support (Dienesch & Liden, 1986; Schriesheim et al., 1999). Members feel like they are increasingly depended on, and high quality leader-member relationships have been associated with greater member perceptions of empowerment and job latitude (Gerstner & Day, 1997).

Members who do not have strong leader-member relationships have often been categorized as “hired hands” (Dienesch & Liden, 1986; Van Breukelen et al., 2006). The resources provided to “out-group” members are scarce, oftentimes limited to what the formal employment contract denotes (Dansereau et al., 1975; Dienesch & Liden, 1986). Furthermore, these members are also viewed negatively in terms of affect or perceived performance capabilities and are selected for less important organizational roles (Dienesch & Liden, 1986; Harris, 2004; Schriesheim et al., 1999). When mature partnerships are established, high quality leader-member relationships lead to increased levels of formal and informal rewards, access to,

and communication with supervisors, and supervisorial support for members (Dienesch & Liden, 1986; Graen et al., 1982). For example, members gain access to their leader's network of resources, receive better job assignments, and are chosen to fill more important organizational roles (Gerstner & Day, 1997; Graen & Uhl-Bien, 1995; Harris, 2004).

To illustrate leader-member relationship dynamics in a VWT team setting, first consider the real world setting of how college football teams are organized. Members of the same team are often separated into groups such as the first, second, or third strings. The first string members are the ones chosen by the coach as the "go to" members and there are benefits associated with being in this group. As compared to other members, first string members gain the lion's share of available resources. These resources may be tangible or intangible. For instance, tangible resources include better sports equipment and full scholarships for tuition. Intangible resources include better access to the coach's expertise and knowledge, increased communication, greater support, and more practice time. The coach and first string members have a strong common vested interest, especially as the first string members receive the coveted starting roles for games, and their performance directly impacts team outcomes.

These leader-member interactions impact the degree to which members feel empowered. Empowerment reflects an active orientation towards work and is a multi-faceted set of cognitions which are shaped by the work environment (Spreitzer, 1995). While earlier studies defined empowerment as motivations derived from self-efficacy, there are other relevant dimensions of interest for understanding the impacts of leader-member relationships in VWTs. For example, Spreitzer (1995) proposed three other empowerment dimensions beyond self-efficacy (called competence in her model): meaning, self-determination, and impact. Meaning reflects the degree to which an individual values work goals or purposes. Self-determination reflects an individual's sense that she has latitude and autonomy in how work is performed. Impact refers to the degree to which an individual feels she has influence over the work unit's outcomes.

Some antecedents to empowerment include self-esteem, locus of control and access to information about an organization's mission or performance (Spreitzer, 1995). Clearly, high-quality leader-member relationships have similar impacts on a member's feelings of empowerment. As noted earlier, the LMX literature suggests that the benefits derived (e.g. allocated resources) depends on the quality of the leader-member relationships. Based upon the football example used earlier, first string team members are afforded many more resources than

third string members. These higher allocations of resources positively influence a member's perceptions of self-determination, competence, and impact. LMX theory also suggests that increased communication is one of the benefits of high-quality leader-member relationships. Increased information flows impact the degree to which members feel empowered. For example, information about the organization's mission is essential to creating a sense of meaning and purpose, and positive information (in the form of feedback from a leader) about performance can reinforce a member's sense of competence (Spreitzer, 1995).

For VWTs, the tangible resources members have access to also play a key role in overall success. For example, in Everquest, a VWT raid of 54 participants may be comprised of nine smaller ad-hoc groups of six members each, and each member may be considered a resource. The composition of these groups within raids is extremely important for two reasons. First, coordination between groups is difficult because of the way the communications are represented to each participant in a raid (Reeves et al., 2007). While group members have easy access to information displays which show the current status of important statistics of each group member (e.g. health), it is difficult to access similar information for other participants outside of one's group. This information asymmetry must be balanced with the unique role each group member has to play as denoted by the class of the avatar. For example, it is not efficient to have a group comprised of members who are unable to heal themselves. Instead, VWT members who are healers are a key resource to be spread across groups.

Second, when grouped together, certain members have abilities that enhance other group members' performance above and beyond what can be achieved alone. For example, bards have the ability to play songs which substantially enhance the fighting ability of every member in the group. Therefore, bards are a key group resource, and are commonly allocated to groups optimized for dealing damage to the VWT's raid target. Strategically, having the proper balance of classes and groups has a direct impact on a VWT's success and survival (Williams et al., 2006). Also, given that certain classes are rare, it is important for leaders to create groups which leverage the best VWT members. For instance, if only one bard is available, the group members who get access to this resource are determined by the VWT leader. Perceptions of the quality of the relationship between the leader and members influence this assignment of groups and the resources allocated to the members in each group. The allocation of resources may be both perceived and observed by members. Therefore,

H1: A higher quality leader-member relationship will positively influence the degree to which a member feels empowered.

H2: A higher quality leader-member relationship will positively influence the degree to which a member is allocated tangible resources

3.3 Leader-Member Relationships and the Development of Resources

The Leadership-Making Model further argues that LMX theory may be viewed as both transactional and transformational, with leader-member relationships that achieve the partnership phase being transformational (Graen & Uhl-Bien, 1995). Several authors have examined transformational leadership styles in the virtual team context. Transformational leadership suggests that “effective leaders transform or change the basic values, beliefs, and attitudes of followers so that they are willing to perform beyond the minimum levels specified by the organization.” (Podsakoff et al., 1990). Early authors (e.g., Avolio et al., 2001) have suggested that transformational leadership may be especially useful in virtual settings. This is because members, when faced with having to communicate via CMCs, develop high levels of uncertainty due to discontinuities, and are more susceptible to charismatic leadership influence. Therefore, transformational leaders in virtual teams can help unite team members to work towards a common cause, which leads to less free-riding (Zaccaro & Bader, 2003).

As discussed in the prior chapter, one way to understand the impact of high quality leader-member relationships is to examine the development of relational capital (Uhl-Bien et al., 2000). Relational capital is a resource created by relationships developed through repeated interactions (Nahapiet & Ghoshal, 1998). Following Nahapiet and Ghoshal (1998), relational capital consists of four dimensions: trust, obligations, norms and identification.

3.3.1 VWT Trust

Trust is defined as "the willingness of a party to be vulnerable to the actions of another party based on the expectation that the other will perform a particular action important to the trustor, irrespective of the ability to monitor or control that other party" (Mayer, Davis, & Schoorman, 1995 p. 712). A key assumption of virtual team work is that trust is “critical to the cooperative behavior that leads to the success of all teams, but is especially important for virtual teams.” (Greenberg, Greenberg, & Antonucci, 2007) For example, trust facilitates the sharing of ideas (Zigurs, 2002), aids in knowledge sharing and the development of transactive memory (Rosen, Furst, & Blackburn, 2007), and helps reconcile differing goals and conflicts within

virtual teams while reducing opportunistic behavior and agency costs (Jarvenpaa & Tanriverdi, 2003). While trust is recognized as being essential to a virtual team's functioning, it takes a significant amount of effort and time to build (Lai & Burchell, 2008).

Trust is critical in VWTs because of the way interactions are structured in MMOGs. For example VWT members have to trust that leaders are implementing the correct overall strategies, in order for the VWT to be successful on a raid (Goh & Wasko, 2009). Trust in other VWT members is equally important. In raiding situations, VWT members have to count on each other in order to successfully accomplish VWT goals. Just like in real life, one's avatar dying in a virtual world has consequences (albeit not as severe). These consequences include a loss of status, items, avatar statistics (such as experience which takes time to get back), and time. Consider a typical raid where fighters have to trust the healers to keep them alive while they engage targets. Healers have to trust the fighters not to turn tail and run when things are going bad, leaving them in the lurch. In large raids, members have to trust that other members are accomplishing their designated roles. The leader-member relationship is crucial to the development of VWT trust because of the mechanisms discussed earlier. Specifically, LMX theory suggests that high quality leader-member relationships allow the transmission of values (e.g. trust in team members) from leaders to members, and members buy-in because of the strong influence inherent in the relationship. Through high quality leader-member relationships and assuming that the leader's goals are to maximize performance,

H3: A higher quality leader-member relationship will positively influence a member's level of trust with VWT members.

3.3.2 VWT Obligation

Obligations "represent a commitment or duty to undertake some activity in the future" (Nahapiet & Ghoshal, 1998 p. 255). Obligations may be durable and can arise from feelings such as gratitude, respect, and friendship, or may be accorded from membership in a collective (Bourdieu, 1986). Professional and personal obligations develop over time through a variety of social exchanges. For example, frequent information exchanges between members bind members closer together because of the increasing expectations about future obligations (Nahapiet & Ghoshal, 1998). Obligations change as leader-member relationships mature into partnerships. For example, in the early stages of relationship formation, actors "keep track of favors and watch for payback, and expect this payback within a reasonable amount of time (Uhl-

Bien et al., 2000). Furthermore, through high quality leader-member relationships, members are fully committed to each other and place collective interests above their own. This allows relationships between members to be relatively stable, encourages the open exchange of favors, and lengthens the time span allowed for reciprocation.

Building a sense of obligation to other members of the VWT is an essential undertaking in order to assure the survival and success of the VWT. For example, the goal of raiding is to reap the rewards earned from successfully accomplishing the raid's objectives. However, the rewards derived (e.g. loot) are oftentimes scarce. It is common for a raid event that takes a VWT of 50+ members to accomplish, to only bestow rewards for only 2 to 3 members. Without a sense of obligation to motivate continued participation over a long period of time, self-interest and arguments over the allocation of loot can tear apart VWTs (Williams et al., 2006). Consider the following personal example:

I was interested in obtaining an item of extraordinary power for my avatar, which involved quests that took months to complete. At the very end of this journey, I required an item dropped by a particularly rare dragon to finish my quest. This dragon was elusive, appearing randomly anywhere between 0 to 72 hours from the last time he appeared. Also, the dragon was extremely formidable, and required at least another 30 to 40 people to overcome. Being so rare, the dragon was prized by many other potential dragon hunters in different guilds, necessitating the quick marshalling of one's guild members at any time of the day, in order to reap the spoils. Therefore, I spent weeks checking to see if the dragon was around before deciding to just sit there (called camping in game vernacular) and wait. After nearly 50 hours of sitting in front of my computer, the dragon finally appeared – at 4:00 in the morning. I called my guild leader via telephone, who kept a contact list of all the guild members, who in turn contacted via e-mail, discussion board, telephone, and instant messages, any available guild members. Within fifteen minutes, enough guild members from all over the world had arrived with their avatars, in order to help me achieve my goal.

This example illustrates the degree to which a sense of obligation is critical to coordinate work within VWTs. Objectives for the VWTs are fluid and require quick coordinated responses by individuals working across discontinuities. From a member's perspective, the ability to get help at any time and any place from other VWT members creates a network of obligations which are very durable. For instance, I attended over forty other such spontaneous raids at all hours of

the day, realizing the obligations I had to the other VWT members. Like this example, it is the role of leaders, through leader-member relationships, to facilitate and coordinate activities by which obligations to the VWT are built over a period of time (Uhl-Bien et al., 2000).

H4: A higher quality leader-member relationship will positively influence a member's level of obligation the VWT.

3.3.3 VWT Norms

Norms represent a degree of consensus about the appropriate actions members within an organization can take, where control over actions is held by the collective (Nahapiet & Ghoshal, 1998). Because coordinating work is challenging due to the discontinuities surrounding virtual teams, norms help facilitate coordination by establishing rules for appropriate interactions. Consider a typical virtual team assembled to craft a solution to a particular problem. Team members are selected for their personal expertise, oftentimes from different departments, and are usually non-located and work across time zones using CMC technologies. Kanawattanachai & Yoo (2002) suggest that the lack of a shared work history hinders interactions. Moreover, the lack of face-to-face communications makes it difficult for team members to gather information and evaluate one another's behaviors while creating an artificial sense of physical and psychological distance. These discontinuities make it very difficult to establish what social norms about how work should be performed (Kanawattanachai & Yoo, 2002).

Bell and Kozlowski (2002) argue that the one of the critical functions of leaders is to develop the team into a "coherent, seamless, and well-integrated work unit." They suggest that leaders may do this through a socialization process, where leaders provide structure to team member interactions by setting goals and norms, while reducing role ambiguity. For example, leaders should set norms prescribing where and when communications between team members should take place (Cascio & Shurygailo, 2003). This is consistent with other authors' recommendations, such as improving team effectiveness through the clarification of role relationships and responsibilities through regular, detailed, and prompt communications (Kayworth & Leidner, 2000). Leaders also set the tone for future team member interactions by establishing ground rules and modeling teamwork for team members (Cascio & Shurygailo, 2003). Leaders should not assume that relationships between team members will develop automatically over time (Hart & McLeod, 2003), but instead provide a setting conducive to

group relational processes (Kayworth & Leidner, 2000) and promoting cooperation (Cascio & Shurygailo, 2003).

Coordinating work in a VWT requires members to be aware of the expectations for interactions by the VWT, and being familiar with “how things are done”. For example, VWTs are commonly coordinated by means outside of virtual worlds, such as secondary message forums where members can post discussions and get information. As work performed in VWTs requires avatars working together at the same time in the same collocated space, times for raids are usually posted by VWT leaders on when and where (in the virtual world) VWT members are to meet for the day’s raid. However, just like the preparations required for a military campaign, there are logistical considerations. Members have to show up on time, be provided resources, be organized into groups, be given instructions for the raid, and perform their roles in accordance with expectations.

Members have expected roles, as informed by their avatar class, at the beginning of each raid. For instance, members who have beneficial spells which improve other members’ performance are responsible for making sure everyone gets what they need. Therefore, VWT leaders need to communicate the norms and expectations in order to increase efficiencies. However, the unique nature of participating in VWTs makes this a difficult proposition. Unlike real life, work is voluntary in VWTs; people can choose to stop attending or free-ride at any time. One way to overcome this is suggested by LMX theory. By building high quality leader-member relationships characterized by high degrees of mutual influence, leaders are able to effectively communicate to establish expectations and encourage member adherence to these norms (Graen & Uhl-Bien, 1995; Uhl-Bien et al., 2000). Therefore,

H5: A higher quality leader-member relationship will positively influence a member’s awareness of the norms of a VWT.

3.3.4 VWT Identification

Identification is the extent to which individuals see themselves as one with another person or collective (Nahapiet & Ghoshal, 1998). According to the Leadership-Making Model, leaders and members move beyond a relationship that is characterized as “working for”, to one that is characterized as “working together”, towards a common goal (Graen & Uhl-Bien, 1995). More importantly, and consistent with transformational leadership, dyads that advance to the partnership stage “experience a transformation from self-interest to a larger interest” (Graen &

Uhl-Bien, 1995). One effective strategy that leaders may enact is to influence virtual team members to buy into a larger, collective ideal and identify strongly with that ideal. Bell and Kozlowski (2002) suggest instilling team orientation and team coherence by 1) promoting shared goal commitment and positive affect while shaping climate perceptions, and 2) developing individual linked goals to a repertoire of team task strategies and shaping role expectations. Furthermore, leaders are responsible for communicating a shared vision (Walvoord, Redden, Elliott, & Coover, 2008) by avoiding an “us versus them” mentality and promoting an “our” culture instead (Cascio & Shurygailo, 2003).

Within MMOGs, many motivations exist for individuals to want to become members of VWTs. For example, individuals may crave the companionship of like-minded individuals, and seek to join socially-oriented guilds to interact with others. Individuals also seek membership in raiding-oriented guilds for prestige, competitive, and resource-seeking reasons (Williams et al., 2006). Like gang colors, “guild tags”, or the name of the guild one belongs to, are prominently displayed on members’ avatars. Membership in guilds is very important in the social dynamics of the MMOG-place – people care who you are associated with and make attributions about you based upon your guild tag. Furthermore, just like real-world organizations, VWTs commonly compete against each other for the scarce resources available. For example, very popular raid targets that provide the best loot are heavily contested by VWTs. This “forced competition” is instrumental in creating a shared sense of identity for VWT members.

In seeking to encourage identification, VWT leaders strive to build a culture that encourages cohesion, pride, and a shared sense of purpose and vision for VWT members. This process is enhanced by high quality leader-member relationships because of the strong degrees of mutual influence between parties (Graen & Uhl-Bien, 1995). Therefore,

H6: A higher quality leader-member relationship will positively influence a member’s level of identification with the VWT.

3.4 Allocation of Resources and Member Performance

In organizational and human resource studies, it is widely recognized that ownership of, access to, and the ability to effectively deploy resources leads to performance advantages (Barney, 2000; Wernerfelt, 1984). In the context of this study, resources provided to VWTs, as allocated to and developed by VWT members, have a direct impact on member performance. Performance is commonly measured as perceptions of the member’s quality, quantity, timeliness,

and effective performance of their job tasks or roles (e.g., Becker, Billings, Eveleth, & Gilbert, 1996). For instance, the development of human capital at the individual and collective levels has a large impact on organizational effectiveness and performance (Becker & Gerhart, 1996; Uhl-Bien et al., 2000).

A key responsibility of leaders is to provide subordinates with the resources necessary to perform their job functions (Graen & Uhl-Bien, 1995; Van Breukelen et al., 2006; Yukl, 1998). LMX theory suggests that resources allocated to members with high quality leader-member relationships include increased informal and formal rewards, better job assignments, more job latitude, increased communication and access to information, and better access to resources in the leader's network (Gerstner & Day, 1997; Graen & Uhl-Bien, 1995; Schriesheim et al., 1999; Uhl-Bien et al., 2000). Receiving a higher allocation of these resources allows one team member to outperform others.

Empowerment serves as an individual-level source of motivation which positively impacts job outcomes (Spreitzer, 1995). Recent work suggests that empowerment and LMX are conceptually distinct constructs and have important implications for job performance (Harris, Wheeler, & Kacmar, 2009). Simply put, individuals who feel more empowered perform better because they are more self-confident, care about what they are doing, are given the latitude to perform their job roles, and feel like what they are doing has a meaningful impact on the overall work unit. These links have been extensively explored and validated in a variety of work settings (Spreitzer, 1995).

In VWTs, being allocated group-based resources has a large impact on member performance due to the special abilities which certain classes have to complement others. As mentioned in a previous example, bards have the ability to enhance the fighting abilities of fellow group members. According to parses (data analysis of game logs which objectively assess member performance), this effect is quite noticeable. A 25% increase over what members could have accomplished on their own has been noted, indicating a large impact on member performance. Just like in real life, being allocated better resources, although in VWTs has a direct impact on the effectiveness of a member's performance. Therefore,

H7: Higher perceptions of empowerment will positively influence member performance.

H8: Higher tangible resource allocations will positively influence member performance.

3.5 Development of Resources and Member Performance

Relational capital resources (trust, norms, obligation, identification) are developed from the relationships and repeated exchanges occurring within the VWT (Nahapiet & Ghoshal, 1998). These relationships have strategic implications for the management of people as a resource. Relational capital binds VWT members together in relationships characterized by mutual trust, obligation, and identification, under established norms that regulate the interactions between members and determine how things should work. As members develop higher levels of relational capital, this allows for individuals to move beyond self-interest and work effectively as a team. This collective interest is what motivates individuals to work above and beyond the minimum levels specified (Podsakoff et al., 1990). As facilitated by leadership, being able to achieve this collective transformation and develop relational resources is important for performance in virtual settings (Avolio & Kahai, 2003; Purvanova & Bono, 2009).

As discussed earlier, trust facilitates the sharing of ideas (Zigurs, 2002) and aids in knowledge sharing and the development of transactive memory (Rosen et al., 2007). This helps reconcile differing goals and conflicts within virtual teams while reducing opportunistic behavior and agency costs, directly impacting member performance (Jarvenpaa & Tanriverdi, 2003). For example, in VWTs, information exchanges are facilitated by trust and knowing who to ask for advice. Oftentimes, when stuck on a quest or unsure of how game mechanics work, VWT members turn to each other for help. Therefore, when VWT members trust each other enough to ask questions to clarify their role, or about how to improve their performance, their performance will be improved.

H9: Higher levels of trust in VWT members will positively influence member performance.

Higher levels of obligations impact member performance because members feel a responsibility to provide aid to other members due to the development of personal, professional, and exchange relationships (Nahapiet & Ghoshal, 1998; Uhl-Bien et al., 2000). In VWTs, obligation impacts member performance due to the voluntary nature of participation in MMOGs. Without a strong sense of obligation, members may free-ride or cease participation entirely by not attending raids. Drawing from the personal example used earlier, members who feel

obligated to the VWT show up more consistently for raid activities, go above and beyond the minimum requirements, and perform better.

H10: Higher levels of obligation to the VWT will positively influence member performance.

Norms impact member performance by establishing expectations about how work should be performed and evaluated. Additionally, knowing how work should be performed allows for the enactment of roles. For example, on virtual teams which are commonly comprised of subject matter experts from different functional areas, work is divided by expertise and specialization of labor occurs. If the purpose of the virtual team is to introduce a new product line, engineers are responsible for designing, manufacturers building, while marketers are in charge of advertising and selling. In VWTs, norms about what is expected from members also allow for more effective raiding activities when members have clear expectations on their job roles, what is to be done, and how their performance will be evaluated.

H11: Higher awareness of the VWT's norms will positively influence member performance.

Identification with a collective positively influences member outcomes in several ways. First, higher levels of identification enhance member concern for collective processes and outcomes – the more one identifies with a collective, the more motivated one is to work harder on an individual level for collective benefits (Uhl-Bien et al., 2000). In the virtual team literature, numerous scholars have remarked that building team unity and identity are key inputs for the success of virtual teams (Hertel et al., 2005; Martins et al., 2004; Pinsonneault & Caya, 2005; Powell et al., 2004). As discussed earlier, members of VWTs place high value on VWT identification. Outsider perceptions about the VWT such as guild reputation, success, and accomplishments strongly motivate members to perform better. Also, due to the raid mechanics of MMOGs, in which VWTs have to work towards common objectives, building a strong team identity and team identification with the VWT should result in positive impacts on the team member performance.

H12: Higher levels of identification with the VWT will positively influence member performance.

Figure 2 provides a representation of the hypothesized path model.

Figure 2: Hypothesized Path Model

CHAPTER 4

METHODOLOGY

4.1 Overview

In this chapter, the proposed research methodology is presented. In order to establish the appropriateness of the methodology employed to the research question at hand, the chapter includes the following. First, the unit of analysis and population is described. Second, the sampling frame and sample used for data collection are discussed. Third, the research design and data collection procedures are explained. Fourth, the measures used for assessing the independent and dependent variables are discussed. Lastly, the data analysis strategy employed is presented.

4.2 Unit of Analysis, Population, and Sampling Frame

The unit of analysis for this dissertation is the individual guild member in a MMOG, where a guild is an example of a VWT. There are two primary reasons for the focus on individual guild members. First, according to LMX theory, work is performed by individuals through the enactment of roles which are negotiated between leaders and members. Accordingly, a large body of work has examined the impacts of LMX on outcomes at the individual level (Gerstner & Day, 1997). Second, LMX theory holds that a leader has unique relationships with each of their subordinates and the quality of these relationships impact member outcomes. Therefore, as work performed by guilds may be construed as the summation of individual efforts, each individual's contribution is important. For these reasons, the use of LMX theory and the individual as the unit of analysis are appropriate for the investigation of this research.

As the primary focus of this research is to better understand how the quality of the guild leader-member relationship impacts member outcomes, the population of interest consists of participants in MMOGS who are organized into guilds, specifically raiding-oriented guilds. The type of guild is significant as guilds can have differing purposes. For example, socially-oriented guilds have no stated objectives other than to facilitate social interactions and companionship among members (Williams et al., 2006). Therefore, in terms of understanding member outcomes such as performance, it stands to reason that studying members of socially-oriented guilds would not be optimal. On the other hand, raiding-oriented guilds are comprised of members who 1)

cooperate rather than compete with each other and 2) operate in raiding environments that require extensive coordination among guild members. For readers unfamiliar with MMOGs, gaming-related terminology, and guild dynamics, a glossary of common terms and definitions is provided in the appendix of this dissertation.

Raiding-oriented guilds share many similarities with virtual teams in real-world organizations in terms of makeup, shared sense of purpose, and the interdependent nature of how work is performed (Castronova, 2005; Ducheneaut et al., 2007; Williams et al., 2006). Therefore, raiding-oriented guilds, which hinge upon the performance of their guild members, are an appropriate population.

The sampling frame consists of members of the population to be included in the sample (Fowler, 2002). The sampling frame for this research includes members of a single, highly-competitive raiding guild within the MMOG Everquest. Everquest is generally regarded by on-line gamers as being difficult to master with highly challenging end-game content and tight interdependencies between participant roles, which necessitates extensive cooperation among participants. Also, unlike other MMOGs, Everquest is the only MMOG which emphasizes large raid sizes. For instance, while the popular MMOG World of Warcraft raid content is tailored for 10 to 25 concurrent participants, Everquest raid content is currently designed for up to 54 participants. Naturally, larger numbers of individual participants present a non-linear increase in coordination efforts, and leadership duties and requirements (Steinkuelher, 2004), thereby justifying the choice of Everquest for this research.

There are approximately 60 high-end raiding guilds currently in Everquest (www.lavanet.no/progress/). While the sampling frame includes members of only one of sixty possible guilds, there are two reasons for this choice. First, a practical consideration is the involvement required by guild leaders in order to conduct this research. For example, if 80 guild members were to participate in this research, the guild leader would have to respond to nearly 1,150 items about relationship quality and performance alone. Second, guilds are surprisingly isomorphic and adopt practices from other guilds that are perceived to be successful. Most guilds are therefore alike, and the member composition of successful guilds are very similar (Williams et al., 2006). Therefore, this sampling frame provides generalizability to the population of interest.

4.3 Data Collection

For this research, the data collection includes subjective and objective measures. For the subjective measures, a field study utilizing a survey research design is employed. According to Yin (2003), surveys are desirable when the research question is focused on quantifiable data, the researcher has no behavioral control over the phenomena, and the researcher is interested in studying the phenomena in situ. This study meets these criteria.

The data collected via the survey was obtained by self-administered web-based questionnaires and spreadsheets distributed via e-mail. One way suggested to mitigate some of the effects of common method bias is to collect the independent and dependent variables at two different points in time (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). Therefore, the survey data was collected in two phases, with the collection of the independent and dependent variables separated by a five-and-a-half week time lag. The logs of group compositions on raids, an objective measure, is used to assess the allocation of resources by examining how guild members were assigned to optimal groups within raids.

4.4 Measures

This section presents the measures used in this study. The survey measures were adapted from previously validated instruments in prior MIS and organizational studies. This allows for the triangulation of results with prior studies, contributes to the rigor of the study, aids in the interpretation of results, and raises confidence in the validity of the study's results (Straub, 1989).

4.4.1 Leader-Member Relationship

The quality of the leader-member relationship is measured via survey. Substantial debate remains about whether the LMX construct is a uni or multi-dimensional construct, as well as the appropriate dimensions for investigating LMX (Schriesheim et al., 1999; Schriesheim et al., 1992; Van Breukelen et al., 2006). However, many studies have utilized the unidimensional LMX7 measure championed by Graen and colleagues, with an influential meta-analysis suggesting that the LMX7 had the soundest psychometric properties among available instruments (Gerstner & Day, 1997). Therefore, LMX7 was selected and the following items and scales were used to assess the perceptions of relationship quality from both the guild leader's and members' perspectives.

One limitation of past LMX studies has been the over-emphasis of relying on studies which survey and report only one perspective of the leader-member relationship (usually the member). As LMX theory suggests that both perspectives are important, the approach taken by this dissertation aims to more accurately the relationship by measuring both perspectives. The guild leader completed the questions for each member, and each member provided a self-assessment. The quality of the leader-member relationship was calculated for each individual by taking the average of the of leader and member ratings on each item.

Table 2: Items for Measuring Leader LMX

Leader Perspective (Graen & Uhl-Bien, 1995)	1	2	3	4	5
Does this member know where he/she stands with you?	Rarely	Occasionally	Sometimes	Fairly Often	Very Often
Does this member usually know how satisfied you are with what he/she does?	Rarely	Occasionally	Sometimes	Fairly Often	Very Often
How well do you understand this member's role/class problems and needs?	Not a Bit	A Little	A Fair Amount	Quite a Bit	A Great Deal
How well do you recognize this member's potential?	Not at All	A Little	Moderately	Mostly	Fully
Regardless of how much formal authority you have, what are the chances that you would use your power to help solve this member's problems in the guild?	None	Small	Moderate	High	Very High
Regardless of how much formal authority you have, what are the chances that you would "bail this member out" at your expense?	None	Small	Moderate	High	Very High
I have confidence that this member would defend my decisions if I were not present to do so	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
How would you characterize your working relationship with this member in the guild?	Extremely Ineffective	Worse Than Average	Average	Better Than Average	Extremely Effective

Table 3: Items for Measuring Member LMX

Member Perspective (Graen & Uhl-Bien, 1995)	1	2	3	4	5
Do you know where you stand with your guild leader?	Rarely	Occasionally	Sometimes	Fairly Often	Very Often
Do you usually know how satisfied your guild leader is with what you do?	Rarely	Occasionally	Sometimes	Fairly Often	Very Often
How well does your guild leader understand your role/class problems and needs?	Not a Bit	A Little	A Fair Amount	Quite a Bit	A Great Deal
How well does your guild leader recognize your potential?	Not at All	A Little	Moderately	Mostly	Fully
Regardless of how much formal authority your guild leader has built into his/her position, what are the chances that your guild leader would use his/her power to help you solve problems in the guild?	None	Small	Moderate	High	Very High
Regardless of how much formal authority your guild leader has built into his/her position, what are the chances that your leader would “bail you out” at his/her expense?	None	Small	Moderate	High	Very High
I have enough confidence in my guild leader that I would defend and justify his/her decision if he/she were not present to do so	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
How would you characterize your working relationship with your guild leader?	Extremely Ineffective	Worse Than Average	Average	Better Than Average	Extremely Effective

This is not to say that approach is not without its limitations. For example, consider the following dyadic relationships (on a 5 point scale): 1) Leader and follower both rate the relationship as a 3 and 2) Leader rates the relationship as a 5 and the follower rates the relationship a 1. While both examples would average to a 3, this is not to say that the relationships are necessarily equal. However, this approach is consistent with recognizing that this dissertation seeks to understand the influence of the overall leader-member relationship on member outcomes.

4.4.2 Allocation of Resources

Resource allocation includes the member's perceptions of his/her allocated resources and the assessment of resources provided by the leader to the member. Therefore, the allocation of resources was measured in two ways, the guild member's assessment of empowerment and the degree to which a guild member was assigned to an optimal group.

4.4.2.1 Member Empowerment

Member empowerment represents the extent to which members feel they have been allocated resources to do their jobs. These resources consist of 1) meaningful work, 2) feelings of competence, 3) self-determination, and 4) impact, and reflect the extent to which individuals would like to and feel that they are able to control their work role and context. The following items and scales were used to assess members' perceptions of their allocation of resources.

Table 4: Items for Measuring Member Empowerment

Empowerment (Spreitzer, 1995)	1	2	3	4	5
The raiding I do is very important to me	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Raiding is personally meaningful to me	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
The raiding I do is meaningful to me	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
I am confident in my ability to do my job on raids	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
I am self-assured about my capabilities to perform raiding activities	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
I have mastered the skills necessary to do my job on raids	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
I have significant autonomy in determining how I do my job on raids	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
I can decide on my own how to go about my role on raids	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
I have considerable opportunity for independence and freedom in how I do my job on raids	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
My impact on what happens in my guild is large	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
I have a great deal of control over what happens in my guild	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
I have significant influence over what happens in my guild	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

4.4.2.2 Group Assignment

This measure reflects the tangible allocation of resources to members and was operationalized by averaging the rating of each member's group assignments on raids over the 5.5 week data collection period. A raid is a large-scale collaboration by members of a VWT towards a common goal. Raids have objective goals (e.g., slay the dragon) and require the coordination of a guild's resources to successfully complete in order to reap the rewards (e.g., loot). Raids may take a matter of 30 minutes to several hours for the more complex raids. In Everquest, raids are tailored for 54 simultaneous participants.

Each raid is made up of multiple ad-hoc groups where each group consists of 1 to 6 members. Data about group compositions were collected in an event-driven manner. For the VWT studied, dragon kill points (DKPs) are awarded for hourly participation and the successful completion of raids. Each time DKP is awarded, an entry is created in the DKP database which essentially records all the raiding activities of the VWT. Figure 3 shows what a typical DKP entry in the DKP database looks like for the successful completion of one raid. The data recorded includes the DKP awarded, the participants present, and items purchased using DKP.

In order to accurately capture the when raids occurred as well as the group compositions of each raid, each time a DKP entry was generated, a log which captured group compositions was manually recorded. Figure 4 shows an example of the raw data which was collected for each DKP entry. This data included information about the name of member's avatar, the class of the avatar, the level of the avatar, and which group they were assigned to.

ID	11378
Raid Type	SoF-Crystallos-Kerafym
When	06-04-2008
DKP	60.00
Note	
Entered by:	Senzi
Attendees (54)	Bahumba Battleblade Beatface Blaat Caduseus Caladel Cashtiger Cattarraa Charb Dalerian Dayiil Demorgoth Draconius Ebonylight Falderon Frammish Fryn Fulorian Funi Goladdor Gonafee Healier Heile Hunttar Iksa Inphared Janistin Jeromeru Kalebb Keel Kirzan Kosanob Lalila Madlez Mixoflik Myzr Panorramix Polanya Pull Realmkaster Rihard Sadinna Senzi Shae Shonuf Sikash Sinthia Skuz Stonei Terroz Tivia Tlue Vashon Zaknafein
Items Dropped	Glowing Prismatic Rune to Caduseus for 0.00 Glowing Prismatic Rune to Funi for 0.00 SoF Runes to Caduseus for 0.00 SoF Runes to Funi for 0.00 Prismaridescent Essence (Chest) to Mixoflik for -100.00 Prismaridescent Essence (Chest) to Polanya for -100.00 Prismatic Faycite to Beatface for -300.00 Crystallized Quarreler to Falderon for -500.00 Handwraps of the Crystalline Fortress to Pull for -500.00 Giovin the Conflagrator to Kalebb for -850.00 Porous Stonegirdle of Recovery to Funi for -1000.00
Adjustments	

Figure 3: Screenshot of DKP Entry

The VWT leader was responsible for the organization of guild members into groups and the ultimate goal is to create groups which have the optimal make-up of classes which allow the members of each group to achieve better performance. This is an important goal because certain classes have skills and capabilities which complement others in the same group and enhance performance above and beyond what each individual group member could achieve alone. Also, the number of available members from each class (called class balance) is limited and group composition maximization is crucial to a VWT's goals (Williams et al., 2006). For instance, consider the following example of two real life groups: 1) A group comprised of representatives from only from the marketing department and 2) a group with representatives from design, manufacturing, supply-chain, and marketing. If the goal is to design a product for sale or

distribution, group 2 has obvious advantages from the tangible allocation of resources (e.g. human capital) which allow it to outperform group 1.

Day	ID	Name	Role	DKP	Group
Sun	11249	Melion Online	Cleric	85	Group Leader
Sun	11249	Melion Online	Paladin	85	
Sun	11249	Melion Online	Cleric	85	
Sun	11249	Melion Online	Warrior	85	
Sun	11249	Melion Online	Druid	85	
Sun	11249	Melion Online	Group Leader	85	
Sun	11249	Melion Online	Warrior	85	
Sun	11249	Melion Online	Warrior	85	
Sun	11249	Melion Online	Paladin	85	
Sun	11249	Melion Online	Cleric	85	
Sun	11249	Melion Online	Cleric	85	
Sun	11249	Melion Online	Monk	85	Group Leader
Sun	11249	Melion Online	Rogue	85	
Sun	11249	Melion Online	Bard	85	
Sun	11249	Melion Online	Shaman	85	
Sun	11249	Melion Online	Monk	85	
Sun	11249	Melion Online	Berserker	85	
Sun	11249	Melion Online	Group Leader	85	
Sun	11249	Melion Online	Wizard	85	
Sun	11249	Melion Online	Wizard	85	
Sun	11249	Melion Online	Druid	85	Raid Leader
Sun	11249	Melion Online	Enchanter	85	
Sun	11249	Melion Online	Magician	85	
Sun	11249	Melion Online	Ranger	85	Group Leader
Sun	11249	Melion Online	Beastlord	85	
Sun	11249	Melion Online	Bard	85	
Sun	11249	Melion Online	Shaman	85	
Sun	11249	Melion Online	Monk	85	
Sun	11249	Melion Online	Berserker	85	
Sun	11249	Melion Online	Beastlord	85	Group Leader
Sun	11249	Melion Online	Ranger	85	
Sun	11249	Melion Online	Berserker	85	
Sun	11249	Melion Online	Rogue	85	
Sun	11249	Melion Online	Shaman	85	
Sun	11249	Melion Online	Monk	85	
Sun	11249	Melion Online	Warrior	85	Group Leader
Sun	11249	Melion Online	Shadow Knight	85	
Sun	11249	Melion Online	Cleric	85	
Sun	11249	Melion Online	Cleric	85	
Sun	11249	Melion Online	Paladin	85	
Sun	11249	Melion Online	Enchanter	85	Group Leader
Sun	11249	Melion Online	Wizard	85	
Sun	11249	Melion Online	Cleric	85	
Sun	11249	Melion Online	Wizard	85	

Figure 4: Illustration of Raw Data Collected Per DKP Entry

In Everquest, avatars belong to specific classes, which denote their roles on raids. Grouping several classes into archetypes, allows for a basic understanding of how the enactment of roles allows for the successful completion of raids through collaboration. The tank archetype consists of avatars whose primary duties are to absorb damage from enemies and to protect the other members of the VWT. The healer archetype consists of avatars whose primary duties are to keep everyone alive through healing spells, along with buffing and rezzing responsibilities. Buffing refers to beneficial spells which increase an avatar's capabilities and rezzing refers to the act of resurrecting a dead avatar. The damage-per-second (DPS) archetype consists of avatars whose primary duty is to defeat enemies by dealing damage. The support archetype consists of

avatars whose primary duties are to provide buffing and crowd control duties as well as specialized capabilities to enhance other avatar's performance. Crowd control is a very important duty in MMOGs and describes a strategy to counteract situations in which sheer numbers of opponents threaten to overwhelm VWTs on raids.

Naturally, tight interdependencies exist between archetypes. For example, tanks are required to shield everyone else from damage but require extensive healing. Tanks or healers by themselves are unable to deal the substantial damage which DPSers are capable of in order for the VWT to win. Support classes provide incremental benefits to the VWT by buffs and can enhance their group member's individual performance. To use a football analogy, a team is typically divided into offense, defense, and special teams. Each subunit requires the optimal mix of human capital in terms of player roles (try protecting the quarterback without 5 good offensive linemen) and subunits depend on each other's success for the overall team to win (e.g. see FSU from 2006 – 2009 for the importance of having a defense).

Similarly, for a VWT to succeed on raids, how avatars are grouped together for optimal performance is an important consideration. In order to determine how to assess group compositions, 7 individuals with experience in creating groups were interviewed to create a coding rubric. Four of these individuals were internal to the VWT studied and 3 came from different VWTs, all had prior experience with leadership responsibilities in a guild and thus had experience with optimizing group compositions. Based upon these interviews, two important criteria emerged.

First, an optimal group is a group in which the abilities and roles of the individual group members complement each other, such that each member's performance is enhanced above and beyond what they could individually achieve. For example, an optimal damage dealing group would have a bard and shaman along with the best damage dealing melee classes because those support classes allow the melee classes to fight faster and harder. An optimal tank group would have sufficient healers within the group in order to keep the tanks alive. A non-optimal group would be a group cobbled together with leftover members who do not complement each other or for reasons of convenience.

Second, group compositions should also be assessed for the veterancy of its members. This is because newer members usually lack prior experience with raids nor have well-gearred avatars and therefore tend not to receive optimal group assignments. Using the DKP database,

individuals with tenure of less than 3 months with the guild were noted. Therefore, groups were assessed based upon the classes of their group members as well as identifying groups comprised of newer members.

Figure 5 represents how group compositions were assessed. Possible scores ranged from 1 (suboptimal group) to 5 (optimal group) and each member of the same group received the same score. For example, group 1 represented a tank group and had the optimal balance of tanks and healers (3 tanks and 3 healers). However, two of the members of the group were new to the VWT and therefore this group received a rating of 4. Group 2 represented another tank group and also had the optimal balance of tanks and healers (3 tanks and 3 healers). Each member of the group was a veteran with the VWT and therefore this group received a rating of 5.

Group 9 was a group that appeared to be thrown together for convenience. In this group, there was one tank, one healer, and one DPS class. None of these classes have skills which complement each other and one of the members is new to the VWT. Therefore, this group received a 3 (neutral). Groups that would receive a 1 or a 2 would include groups where a distinct lack of class would lead to poor performance, for example the complete lack of a group or groups with no minimal support expected (e.g. no healers).

4.4.3 Development of Resources

As discussed earlier, the development of resources refers to the development of relational capital with the VWT. This was measured by assessing the member's perceptions of their relational capital with the VWT. Specifically, the perceptions measured were VWT trust, VWT obligation, VWT norms, and VWT identification.

F10		6								
	A	B	C	D	E	F	G	H	I	J
1	Group	Name	Level	Class	Rating	Group	Name	Level	Class	Rating
2	1	Reghan	85	Cleric	4	5	Klaian	85	Ranger	4
3	1	Durkan	85	Paladin	4	5	Zigee	85	Beastlord	4
4	1	Kinek	85	Cleric	4	5	Bluzse	85	Bard	4
5	1	Battleblad	85	Warrior	4	5	Funus	85	Shaman	4
6	1	Elkar	85	Warrior	4	5	Pull	85	Monk	4
7	1	Drakrin	85	Druid	4	5	Sikash	85	Berserker	4
8	2	Blaat	85	Druid	5	6	Cashtiger	85	Beastlord	3
9	2	Belzarak	85	Warrior	5	6	Hunttar	85	Ranger	3
10	2	Demorgot	85	Warrior	5	6	Beatface	85	Berserker	3
11	2	Dalerian	84	Paladin	5	6	Cylint	85	Rogue	3
12	2	Tlue	85	Cleric	5	6	Myzr	85	Shaman	3
13	2	Preese	85	Cleric	5	6	Polamalu	85	Monk	3
14	3	Kamarag	85	Monk	5	7	Rokbottor	85	Warrior	3
15	3	Odroeno	85	Rogue	5	7	Yslaathx	85	Shadow K	3
16	3	Rhyme	85	Bard	5	7	Fumen	85	Warrior	3
17	3	Frejaxe	85	Shaman	5	7	Heile	85	Cleric	3
18	3	Draconius	85	Monk	5	7	Healier	85	Cleric	3
19	3	Radical	85	Berserker	5	8	Sensimel	85	Enchanter	4
20	4	Polanya	85	Bard	4	8	Celrond	85	Wizard	4
21	4	Eliahna	85	Wizard	4	8	Toscana	85	Cleric	4
22	4	Cinexa	85	Wizard	4	8	Windfinde	85	Wizard	4
23	4	Ebonyligh	85	Druid	4	8	Cereborn	85	Necromar	4
24	4	Alyarie	85	Enchanter	4	8	Phanser	85	Wizard	4
25	4	Adamant	85	Magician	4	9	Yazaru	85	Shadow K	3
26						9	Ckira	85	Cleric	3
27						9	Drinki	85	Necromar	3

Figure 5: Assessment of Group Assignment

4.4.3.1 VWT Trust

As a form of relational capital, trust may be assessed as perceptions of trust in other individuals within the same social group (Nahapiet & Ghoshal, 1998). Following, Mayer et al. (1995), trust is the extent to which VWT members are willing to be vulnerable to the actions of other team members and hold expectations that other team members will perform actions important to each other. Recognizing that trust is a multi-dimensional construct, the following items measuring the underlying trust dimensions of benevolence, integrity, and ability were adapted from the items created to assess trust in global virtual teams by Jarvenpaa, Knoll, and Leidner (1998). The following items and scales were used to assess the perceptions of trust members held about the VWT.

Table 5: Items for Measuring Trust in VWT

Trust (Jarvenpaa et al., 1998)	1	2	3	4	5
The outcomes of raiding are very important to guild members	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Guild members would not knowingly do anything to disrupt or slow down raids	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Guild members are concerned about what is important to the guild as a whole	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Guild members will do everything within their capacity to help raids to be successful	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
I never am doubtful about whether guild members will do what they promised	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
I like the work values of my fellow guild members	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Guild members do not behave in a consistent manner - I am never sure if they are going to do what they promise or not (R)	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
I feel very confident about guild members' skills	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Guild members have much knowledge about the work that needs to be done	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Guild members have specialized capabilities that can increase the guild's performance	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Guild members are very capable of performing their tasks	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

4.4.3.2 VWT Obligation

Relationships bring obligations. Whether obligations arise from affective processes (e.g., gratitude and respect) or from group or organizational membership, these obligations are durable (Nahapiet & Ghoshal, 1998). The following items and scales were used to assess the degree to which members felt obligated to the VWT.

Table 6: Items for Measuring VWT Obligation

Obligation (Sager, 2004)	1	2	3	4	5
Do you feel a sense of obligation to participate in raids with the guild?	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Do you feel responsible to help other guild members?	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Do you feel that other guild members expect you to participate in raids?	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

4.4.3.3 VWT Norms

Norms reflect “expectations that bind” members together (Nahapiet & Ghoshal, 1998). Often, being a member of an organization brings with it socially-defined rules that define acceptable behaviors and actions by members and interactions between members. The following items and scales were used to assess the degree to which members understood and were aware of the norms of the VWT.

Table 7: Items for Measuring VWT Norms

Norms (Wasko and Faraj, 2000)					
I am aware of this guild's set of norms or rules for participation	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
I am aware of this guild's guidelines about appropriate behavior	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
The guild has norms and expectations about what constitutes appropriate interaction	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

4.4.3.4 VWT Identification

Organizational identification refers to the extent to which an organizational member’s sense of self-identity overlaps with the organization’s identity (Kreiner & Ashforth, 2004). Based upon the identification items from Mael and Ashforth (1992) and the organization identity strength items from Kreiner and Ashforth (2004), the following items and scales were used to assess member identification with the VWT.

Table 8: Items for Measuring VWT Identification

Identification (Kriener & Ashforth, 2004)	1	2	3	4	5
There is a common sense of purpose in this guild	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
This guild has a clear and unique vision	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
There is a strong feeling of unity in this guild	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
This guild has a specific mission shared by its members	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
When someone criticizes my guild, it feels like a personal insult	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
I am very interested in what others think about my guild	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
When I talk about this guild, I usually say 'we' rather than 'they'	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
This guild's successes are my successes	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
When someone praises this guild it feels like a personal compliment	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
If a story on the server criticized this guild, I would feel embarrassed	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

4.4.4 Member Performance

For this dissertation, member outcomes are operationalized as member performance. Performance data was collected from three sources: 1) leader-assessed for each member, 2) member self-assessed, and 3) peer-assessed among members of each class. Due to possible self-fulfilling biases, for example a leader rating an employee as higher performing for affective and not objective reasons, measuring performance from a variety of perspectives is important (Gerstner & Day, 1997; Graen & Uhl-Bien, 1995; Schriesheim et al., 1999). These ratings were averaged (weighted average) to form an overall performance score. Each perspective was weighted equally: individual (33%), peer (33%), and leader-rated performance (33%). For the leader assessed performance rating, the guild leader rated each member's performance based on six items. In addition, members rated themselves and their peers on the same six items. The following items and scales were used to assess the performance of guild members.

Table 9: Items for Measuring Leader-Assessed Performance

Leader-Assessed Member Performance (Becker et al., 1996)	1	2	3	4	5
On raids, this guild member does his/her job in a timely and effective manner	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
On raids, this guild member performs high quality work	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
On raids, this guild member completes tasks in an unsatisfactory manner (R)	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
This guild member's quality of work is	Very Unsatisfactory	Unsatisfactory	Neutral	Satisfactory	Very Satisfactory
This guild member's quantity of work is	Very Unsatisfactory	Unsatisfactory	Neutral	Satisfactory	Very Satisfactory
This guild member's overall performance is	Very Unsatisfactory	Unsatisfactory	Neutral	Satisfactory	Very Satisfactory

Table 10: Items for Measuring Self-Assessed Performance

Self-Assessed Performance (Becker et al., 1996)	1	2	3	4	5
On raids, I do my job in a timely and effective manner	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
On raids, I perform high quality work	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
On raids, I complete tasks in an unsatisfactory manner (R)	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
My quality of work is	Very Unsatisfactory	Unsatisfactory	Neutral	Satisfactory	Very Satisfactory
My quantity of work is	Very Unsatisfactory	Unsatisfactory	Neutral	Satisfactory	Very Satisfactory
My overall performance is	Very Unsatisfactory	Unsatisfactory	Neutral	Satisfactory	Very Satisfactory

Table 11: Items for Measuring Peer-Rated Performance

Peer-Assessed Performance (Becker et al., 1996)	1	2	3	4	5
On raids, this guild member does his/her job in a timely and effective manner	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
On raids, this guild member performs high quality work	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
On raids, this guild member completes tasks in an unsatisfactory manner	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
This guild member's quality of work is	Very Unsatisfactory	Unsatisfactory	Neutral	Satisfactory	Very Satisfactory
This guild member's quantity of work is	Very Unsatisfactory	Unsatisfactory	Neutral	Satisfactory	Very Satisfactory
This guild member's overall performance is	Very Unsatisfactory	Unsatisfactory	Neutral	Satisfactory	Very Satisfactory

4.4.5 Control Variables

In order to control for other influences on performance, the following control variables were collected : demographics such as members' age, level of education, gender, and employment status, guild tenure (assessed objectively using entries from the DKP database), Everquest tenure, gender of the member's avatar (assessed objectively from eqplayers.com), the class of the member's avatar (assessed objectively from eqplayers.com), time spent in Everquest (hours per week), and alternate ability points spent (abilities which enhance one's avatar). The purpose of these control variables are to control for individual differences (e.g., human or avatar capital) which may affect performance, but are not directly related to the leader-member relationship.

4.5 Analytical Strategy

The analytical strategy is summarized in figure 6. This strategy covers pilot testing the survey instrument and the data analysis procedures.

4.5.1 Pilot Test

In order to establish content and face validity, the instrument was presented to a series of experts in the MMOG context. These included both leaders and members of guilds. The experts confirmed the instrument's clarity, correct use of terminology, and completeness.

Figure 6: Analytical Strategy

4.5.2 Data Analysis

The data analysis consisted of two stages. Both stages were conducted using partial least squares (PLS), specifically SmartPLS by Ringle and colleagues (www.smartpls.de). PLS is a commonly accepted method of structural-equation-modeling analysis in MIS and is robust under the conditions of small sample sizes, non-normal data, and multicollinearity (Chin, 1998a). Since this study uses multi-item scales and the model to be tested is a path model, these conditions are ideally suited to structural equation modeling. Furthermore, given that the proposed sample is a single guild, a small base of usable responses is anticipated. For these reasons, PLS is an appropriate data analysis method (Chin, 1998a; Chin, 1998b; Chin & Newsted, 1999).

First, the measurement model needs to be assessed. In this stage, construct validity will be assessed by examining the reliability of the instrument. Next, the convergent and discriminant validities of the items are to be established via factor analysis and an examination of cross-loadings. A Confirmatory Factor Analysis is performed given that previously validated scales were utilized. Second, the hypotheses are tested by assessing the structural model which includes examining the amount of variance explained in the dependent variables and the path coefficients for statistical significance. The following chapter presents the results.

CHAPTER 5

RESULTS

5.1 Overview

The purpose of this chapter is to report the results of the data analysis and is divided into three sections. The first section presents the revisions to the instrument after examination by several subject matter experts, explains the data collection process, and provides descriptive statistics for the sample. The second section presents the analysis of the measurement model, including calculations of reliabilities and assessments of convergent and discriminant validity. The third section presents the results from the evaluation of the structural model. Due to the limitations of the small sample size, two less complex models are tested independently before the fully saturated model is tested to assess the stability of the overall results. Summaries of hypotheses testing are also provided.

5.2 Instrument Revision, Data Collection, and Descriptive Statistics

The instrument was first presented to four MMOG participants with deep knowledge of the Everquest context, two of whom have been guild leaders or officers. Based upon their feedback, minor changes were made to the instrument in terms of wording to improve clarity and one additional demographic variable was added. This revised instrument was used for data collection.

Data collection spanned an eight week time frame. At the beginning of the time frame, data about the leader-member relationship and demographic and control variables were collected. The guild leader and guild officers assessed their relationships with guild members based upon a spreadsheet version of the instrument facilitated by e-mail. Guild members and guild officers assessed their relationship with the guild leader, and self-reported demographic and control variables via a web-based survey. This data was collected during the first two weeks. To better assess the overall leader-member relationship, the leader and member perspectives on the relationship were averaged to create the LMX measure for this study.

For the first five and a half weeks, snapshots of group compositions within raids were collected by the principle investigator who actively participated on guild raids. This data was collected by using the built-in guild organization tool in the Everquest client and exported to a text-based log. Data collection was event-driven - snapshots of group compositions were taken

to coincide as closely as possible with hourly DKP entries and DKP entries which signified the successful completion of raids. In all, 124 usable snapshots were obtained out of a total possible 157 DKP entries (78.9%). Based upon the hourly DKP entries, the guild spent an average of 21.45 hours per week during this time frame on raiding activities.

Following this five and a half week time period, responses to the mediating and self-reported performance variables were collected from the guild officers and members via a web-based survey. In order to triangulate individual performance from a variety of perspectives, data were collected from members, peers, and leaders. Peer-rated performance data was collected via web-based survey by guild members who performed the same job functions on raids as the subjects being assessed. Peer-rated data for each guild member was assessed by 7 out of 17 healer classes, 5 out of 8 support classes, 6 out of 13 tank classes, and 8 out of 23 DPS classes. Additionally, the guild leader and 6 out of 7 guild officers assessed every guild member's individual performance via spreadsheets facilitated by e-mail. As noted above, an overall individual performance measure was created by calculating the weighted average of individual (33%), peer (33%), and leader-rated performance (33%). This data collection phase took approximately two and a half weeks. Figure 7 summarizes the overall data collection procedures.

Figure 7: Data Collection Procedures

Prior to performing any statistical analysis, data cleaning and coding were necessary. Missing data due to attrition by guild members during the sampling frame necessitated dropping responses from several individuals. Data coding was necessary due to several reverse-coded indicators as well as to compute the group assignment variable assessing resource allocations from the text-based logs of group compositions. For each of the logs, each group's composition was evaluated based upon rubrics provided by 7 individuals with prior experience leading in VWTs (4 internal to and 3 external to the VWT studied).

As described in chapter 4, optimal groups had a mix of classes which complemented each other and/or contained veteran members. Suboptimal groups had a mix of classes that did not increase individual performance and/or were made up mostly of newer members or invites. Possible scores ranged from 1 (suboptimal) to 5 (optimal) and members of the same group received the same score. Approximately 10% of the raids, randomly selected, were first coded and the results presented to three VWT leaders to assess coding reliability. After confirming reliability, the remainder of the raids was coded and the scores derived were averaged for each individual based upon their participation over the 124 raiding events collected.

In all, 61 usable responses were collected out of a total of 68 possible respondents in the sampling frame, an 89.7% response rate. Descriptive statistics on the individuals that comprise the sample (n=61) are provided in Table 12.

5.3 Measurement Model

5.3.1 Reliability

Reliability represents the extent to which multiple items comprising a single construct are correlated or covary with each other. Therefore, instruments with high reliabilities are desirable, as the instrument should exhibit consistency across multiple instances. Reliability is typically assessed by calculating Cronbach's α with acceptable levels exceeding 0.70 (Nunnally & Bernstein, 1994). Cronbach's α was calculated for each multi-item construct and items which lowered the construct's reliability were removed. After removing the low-reliability items, Cronbach's α was recalculated and this process was repeated until an acceptable level was reached.

Table 12: Sample Descriptive Statistics

	Minimum	Maximum	Mean
Alternate ability points (AAs)	1300	6500	3725.72
Age (Years)	20	61	33.62
Everquest tenure (Months)	41	138	109.69
Guild tenure (Months)	1	90	29.72
Hours per week spent in Everquest	10	45	27.69
Classes	Frequency	Percent	Cumulative Percent
DPS	23	37.7	37.7
Healer	17	27.9	65.6
Support	8	13.1	78.7
Tank	13	21.3	100
Gender (Real Life)	Frequency	Percent	Cumulative Percent
Male	47	77	77
Female	14	23	100
Gender (In World)	Frequency	Percent	Cumulative Percent
Male	44	72.1	72.1
Female	17	27.9	100
Education	Frequency	Percent	Cumulative Percent
Some high school	0	0	0
High school diploma	5	8.2	8.2
Some college or junior college	28	45.9	54.1
College or junior college degree	17	27.9	82
Some graduate school	5	8.2	90.2
Graduate degree	6	9.8	100
Beyond graduate degree	0	0	100
Employment	Frequency	Percent	Cumulative Percent
Unemployed	8	13.1	13.1
Part-Time	11	18	31.1
Full-Time	42	68.9	100

Reliability is also assessed by examining the item composite reliability (ICR), which may be interpreted similar to a Cronbach's α . Calculated from the block of indicators comprising each construct, ICRs exceeding the 0.70 level are the generally accepted threshold. This is because ICR values less than 0.70 imply that items underlying a particular construct may be unrelated to the construct in question, or measuring more than a single construct. Table 13 shows the initial number of items per construct, items dropped, and the number of items used to assess Cronbach's α and ICRs for each construct after the reliability analyses. Overall, survey items showed high reliability with only two items (T_I3 and PERF3) dropped and all remaining constructs exhibiting acceptable levels of reliability.

Table 13: Instrument Reliabilities - AVEs, ICRs, and Cronbach's Alphas

Construct	Original Items	Items Dropped	Items Used	Cronbach's Alpha	ICR
LMX	8	0	8	0.89	0.934
Empowerment: Competence	3	0	3	0.857	0.915
Empowerment: Impact	3	0	3	0.794	0.879
Empowerment: Meaning	3	0	3	0.893	0.931
Empowerment: Self Determination	3	0	3	0.842	0.906
Trust: Benevolence	4	0	4	0.728	0.826
Trust: Integrity	3	1, T_I3	2	0.757	0.795
Trust: Competence	4	0	4	0.865	0.818
Obligation	3	0	3	0.875	0.924
Norms	3	0	3	0.973	0.982
Identification	6	0	6	0.805	0.863
Identity Strength	4	0	4	0.89	0.920
Performance	6	1, PERF3	5	0.982	0.986

5.3.2 Convergent and Discriminant Validity

SmartPLS 2.0 (Ringle, Wende, & Will, 2005) was used to assess convergent and discriminant validities. Similar to a factor analysis, the PLS algorithm used in SmartPLS allows researchers to assess convergent and discriminant validity by inspecting the calculated outer loadings, interpreted as factor loadings. For assessing convergent validity, Fornell and Larcker (1981) suggest examining the average variance extracted (AVE) of each construct. AVEs

represent a comparison of the amount of variance explained by a latent variable to the amount of variance explained by measurement error. In order to demonstrate that the majority of variance is accounted for by the construct, the generally accepted guideline is for AVEs to exceed 0.50.

Discriminant validity may be assessed by two different ways. Establishing discriminant validity is important as it indicates the extent to which constructs are different from each other, the underlying measures of each construct are distinct, and items load on the appropriate construct. The first way to evaluate discriminant validity is to compare the factor loadings of each item and to verify that 1) the factor loading of each item on its underlying construct exceeds the generally accepted threshold of 0.60 and 2) that the factor loading of each item is higher on its underlying construct than on any other construct (Chin, 1998b).

The second way to assess discriminant validity is to demonstrate that the construct shares more variance with its measures than it shares with other constructs. This is demonstrated by comparing either 1) the AVE with the square of the correlations among latent variables or 2) the square root of the AVEs to the correlations of the latent variables (Barkley, Higgins, & Thompson, 1995; Chin, 1998b). In both cases, AVEs should be higher than the corresponding correlations.

Table 14: Convergent and Discriminant Validity - AVEs, ICRs, and Cronbach's Alphas

Construct	Items Used	AVE	ICR	Cronbach's Alpha
LMX	6	0.7038	0.9343	0.9155
Empowerment: Competence	3	0.7819	0.9148	0.861
Empowerment: Impact	3	0.7085	0.8793	0.7956
Empowerment: Meaning	3	0.8197	0.9314	0.8941
Empowerment: Self Determination	3	0.7637	0.9064	0.8449
Trust: Benevolence	3	0.6154	0.8264	0.683
Trust: Competence	3	0.594	0.8078	0.852
Obligation	3	0.8018	0.9239	0.8769
Norms	3	0.9484	0.9822	0.9727
Identification	4	0.6125	0.863	0.7885
Identity Strength	4	0.7425	0.9199	0.8925
Performance	5	0.9356	0.9864	0.9828

Based upon the steps outlined above, several items that negatively impacted the AVEs or exhibited poor discriminant validity were removed - LMX3, LMX6, ORG_ID2, ORG_ID6, Trust_B2, and Trust_C2. One construct, Trust (Integrity) had to be completely removed as the indicators demonstrated poor discriminant validity. Table 14 shows the final number of items, AVEs, ICRs, and Cronbach's α values for each construct. As can be seen, all AVEs exceed 0.50, all ICRs exceed 0.70, and all Cronbach's α values exceed 0.70, satisfying both tests of convergent validity.

Table 15 shows the factor loadings and cross-loadings of the items retained from the above analyses. As can be seen, all items load higher on their underlying factor than on other factors, satisfying the first test of discriminant validity. Table 16 shows the correlations between the constructs with the square root of the AVEs (in bold) across the diagonal of the correlation matrix. As can be seen, the square roots of the AVEs are larger than any of the off diagonal elements, satisfying the second test of discriminant validity.

5.4 Structural Model

Before assessing the structural model, a test was conducted to determine if any of the control variables were significant predictors of the dependent variable (performance). A model consisting of only the control variables with paths leading to the dependent variable was created. Eleven control variables were included in this analysis - age, archetype, level of education, guild tenure, hours spent per week in Everquest, gender, avatar gender, Everquest tenure, employment, and AAs spent. Three, age ($\beta = -0.340$, $p < 0.01$) guild tenure ($\beta = 0.294$, $p < 0.05$), and hours spent in Everquest ($\beta = 0.324$, $p < 0.01$) were significant predictors of performance and included in the structural model testing. Tables 17 presents the results of this testing.

Table 15: Factor Loadings and Cross-Loadings

	Emp Comp	Emp Impact	Emp Meaning	Emp Self D	LMX	Norms	Obligation	ID	ID_Str	Perf	Trust B	Trust C
Emp_Comp1	0.923	0.467	0.133	0.657	0.480	0.364	0.586	0.456	0.215	0.724	0.120	0.214
Emp_Comp2	0.897	0.557	0.133	0.673	0.448	0.412	0.565	0.432	0.283	0.648	0.113	0.254
Emp_Comp3	0.830	0.410	-0.091	0.461	0.370	0.269	0.511	0.350	0.115	0.501	0.100	0.183
Emp_Impact1	0.495	0.877	0.185	0.497	0.544	0.402	0.499	0.250	0.238	0.437	0.351	0.071
Emp_Impact2	0.447	0.840	0.280	0.500	0.485	0.387	0.494	0.336	0.253	0.442	0.241	0.154
Emp_Impact3	0.424	0.807	0.110	0.433	0.388	0.230	0.290	0.331	0.310	0.343	0.349	0.235
Emp_Mean1	0.170	0.204	0.827	0.100	0.114	0.223	0.138	0.159	0.274	0.098	0.260	0.479
Emp_Mean2	0.032	0.239	0.929	0.114	0.271	0.204	0.073	0.266	0.473	0.111	0.347	0.434
Emp_Mean3	0.068	0.194	0.955	0.099	0.235	0.246	0.148	0.219	0.387	0.140	0.240	0.351
Emp_SelfD1	0.674	0.465	-0.026	0.888	0.378	0.320	0.471	0.379	0.053	0.641	0.158	0.241
Emp_SelfD2	0.605	0.497	0.119	0.898	0.418	0.316	0.473	0.452	0.240	0.632	0.194	0.193
Emp_SelfD3	0.523	0.524	0.197	0.835	0.560	0.455	0.414	0.388	0.243	0.602	0.202	0.316
LMX1	0.487	0.482	0.094	0.505	0.871	0.590	0.565	0.450	0.032	0.572	-0.059	0.075
LMX2	0.446	0.474	0.173	0.492	0.860	0.534	0.525	0.424	0.058	0.635	0.022	0.082
LMX4	0.479	0.554	0.179	0.420	0.869	0.501	0.412	0.371	0.199	0.530	0.114	0.074
LMX5	0.260	0.418	0.289	0.320	0.758	0.345	0.350	0.295	0.248	0.396	0.243	0.169
LMX7	0.422	0.506	0.246	0.454	0.823	0.465	0.346	0.405	0.411	0.466	0.346	0.293
LMX8	0.357	0.415	0.283	0.412	0.847	0.482	0.348	0.339	0.184	0.440	0.207	0.208
Norms1	0.407	0.394	0.262	0.439	0.600	0.989	0.469	0.430	0.295	0.413	-0.001	0.109
Norms2	0.368	0.407	0.258	0.442	0.584	0.981	0.431	0.399	0.246	0.372	-0.011	0.107
Norms3	0.392	0.408	0.188	0.340	0.522	0.952	0.416	0.386	0.235	0.355	-0.015	0.065
Oblig1	0.505	0.438	0.158	0.437	0.473	0.420	0.905	0.436	0.236	0.668	0.013	0.074
Oblig2	0.644	0.521	0.096	0.537	0.506	0.420	0.887	0.464	0.213	0.663	0.031	0.191
Oblig3	0.532	0.432	0.079	0.406	0.379	0.367	0.894	0.409	0.089	0.572	0.010	0.147
Org_ID1	0.327	0.329	0.159	0.421	0.459	0.401	0.443	0.779	0.398	0.467	0.139	0.222
Org_ID3	0.242	0.187	0.208	0.243	0.261	0.246	0.180	0.737	0.288	0.429	0.151	0.158
Org_ID4	0.513	0.287	0.272	0.395	0.310	0.342	0.472	0.854	0.393	0.614	0.289	0.485
Org_ID5	0.361	0.305	0.124	0.377	0.395	0.298	0.394	0.756	0.373	0.394	0.288	0.415
Org_IDStr1	0.234	0.345	0.409	0.252	0.266	0.279	0.270	0.446	0.932	0.204	0.497	0.472
Org_IDStr2	0.227	0.143	0.318	0.148	0.035	0.142	0.118	0.325	0.776	0.115	0.543	0.521
Org_IDStr3	0.087	0.128	0.395	-0.031	0.124	0.166	0.041	0.366	0.842	0.045	0.491	0.433

Table 15 - continued

	Emp Comp	Emp Impact	Emp Meaning	Emp Self_D	LMX	Norms	Obligation	ID	ID_Str	Perf	Trust_B	Trust_C
Org_IDStr4	0.235	0.312	0.374	0.216	0.202	0.251	0.162	0.432	0.889	0.134	0.464	0.343
Perf_All1	0.703	0.448	0.123	0.675	0.578	0.391	0.714	0.622	0.172	0.969	0.162	0.225
Perf_All2	0.689	0.489	0.129	0.678	0.586	0.366	0.691	0.627	0.131	0.964	0.174	0.200
Perf_All4	0.707	0.432	0.101	0.701	0.576	0.365	0.707	0.558	0.154	0.975	0.144	0.234
Perf_All5	0.679	0.508	0.169	0.695	0.587	0.353	0.632	0.603	0.163	0.951	0.186	0.263
Perf_All6	0.688	0.489	0.108	0.713	0.619	0.415	0.699	0.566	0.182	0.977	0.176	0.228
Trust_B1	0.019	0.257	0.148	0.167	0.058	0.114	0.117	0.268	0.371	0.190	0.679	0.398
Trust_B3	0.192	0.350	0.311	0.152	0.178	-0.070	0.020	0.190	0.445	0.127	0.840	0.427
Trust_B4	0.064	0.248	0.266	0.185	0.147	-0.054	-0.096	0.203	0.491	0.092	0.824	0.486
Trust_C1	-0.125	0.068	0.313	0.000	-0.011	-0.071	-0.118	0.169	0.478	-0.084	0.474	0.603
Trust_C3	0.218	0.181	0.442	0.252	0.169	0.116	0.113	0.386	0.474	0.191	0.513	0.973
Trust_C4	-0.005	0.047	0.328	0.131	0.026	-0.115	0.027	0.275	0.502	0.084	0.589	0.687

Table 16: Correlation of Constructs and Square Roots of AVE Values

	Mean	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1 Age	33.62	8.73	1														
2 Guild Tenure	29.72	28.36	.169	1													
3 Hours Per Week	27.69	7.14	-.052	-.102	1												
4 LMX	3.81	0.53	.138	.196	-.188	0.84											
5 Emp - Competence	4.46	0.58	.082	.150	-.106	.484**	0.88										
6 Emp - Impact	3.06	0.75	.020	-.005	-.085	.564**	.537**	0.84									
7 Emp - Meaning	3.93	0.65	.156	-.156	.080	.233	.072	.231	0.91								
8 Emp - Self Determin	4.09	0.65	.122	-.084	-.002	.517**	.671**	.566**	.111	0.87							
9 Group Assignment	4.27	0.47	.075	.156	-.211	.497**	.455**	.297*	-.013	.495**	1.00						
10 Trust - Benevolence	4.15	0.55	.208	-.063	-.039	.168	.119	.360**	.312*	.212	.021	0.78					
11 Trust - Competence	4.01	0.63	.306*	-.234	.170	.065	.023	.117	.412**	0.14	-.224	.606**	0.77				
12 Obligation	4.10	0.64	.115	.114	-.147	.500**	.616**	.507**	.129	.508**	.600**	-.002	.003	0.90			
13 Norms	4.19	0.57	-.049	.059	-.114	.582**	.391**	.409**	.245	.418**	.292*	-.018	-.029	.446**	0.97		
14 Identification	4.23	0.47	.150	-.132	.372**	.457**	.459**	.360**	.235	.462**	.446**	.273*	.311*	.480**	.414**	0.78	
15 Identity Strength	3.92	0.65	.240	-.100	-.027	.178	.208	.264*	.420**	.155	-.037	.575**	.570**	.157	.238	.449**	0.86
16 Performance	4.10	0.48	.246	.122	-.200	.606**	.700**	.487**	.128	.716**	.723**	.164	.066	.706**	.390**	.611**	.138

Table 17: Control Variable Assessment

Path	B	SD	t	Significance
AA Spent -> Performance	0.1268	0.1142	1.1101	ns
Age -> Performance	-0.339	0.0982	3.4511	p < 0.01
Archetype -> Performance	0.1288	0.0832	1.5476	ns
EQ Tenure -> Performance	0.1595	0.1027	1.5534	ns
Education -> Performance	0.1738	0.0909	1.9114	ns
Employment -> Performance	0.0243	0.0852	0.2854	ns
Gender IG -> Performance	-0.2794	0.3271	0.8542	ns
Gender RL -> Performance	0.4276	0.3294	1.2981	ns
Guild Tenure -> Performance	0.2943	0.1237	2.3787	p < 0.05
Hours Spent -> Performance	0.3243	0.1114	2.911	p < 0.01

Testing the research model and corresponding hypothesized relationships between the constructs was conducted by using the bootstrapping technique in SmartPLS. A commonly suggested guideline by Chin and Newstead (1999) indicates that the minimum sample size necessary for running a PLS analysis is ten times the larger of 1) the paths of the endogenous variable with the largest number of paths leading to it or 2) the indicators of the latent construct with the largest number of indicators. While the final sample size (n=61) appears to satisfy guideline number two (LMX is comprised of 6 indicators and $6 \times 10 = 60$), guideline number one is not satisfied (Performance has 11 paths leading to it, suggesting a minimum sample size of $11 \times 10 = 110$). This means that a test of the full research model may have an increased chance of Type II error as there may not be significant statistical power to detect small effects.

Therefore, three separate models were tested. The first model tests the hypothesized relationships of Leader-Member Relationship -> Access to Resources -> Performance. The second model tests the hypothesized relationships of Leader-Member Relationship -> Development of Resources -> Performance. These separate models satisfy both of the minimum sample size guidelines reviewed above. The last model, the full research model, is the most complex research model and is presented in order to assess the stability of the overall results.

For the first two models, 200 samples sets were created to obtain 200 estimates of each of the hypothesized relationships. The bootstrapping technique provides path estimates and t-statistics for each of the relationships. By evaluating the t-value, a p-value may be calculated. Figures 5, 6, and 7 show the significant paths for the structural models for all three models and

the variance explained in the model's dependent constructs (R^2), and tables 18, 19, and 20 summarize the results for each model.

5.4.1 Model 1

Hypotheses 1 and 2 predicted that stronger leader-member relationships would positively influence a member's allocation of resources. A member's allocation of resources was operationalized in two ways 1) empowerment and 2) group assignments. Four dimensions of empowerment were measured 1) competence, 2) impact, 3) meaning, and 4) self-determination to assess the extent to which individuals feel that they are allocated the resources needed to be able to control their work and role context.

Hypothesis 1 was fully supported as all predicted paths were statistically significant. The leader-member relationship positively influenced competence ($\beta = 0.496$, $p < 0.01$, $R^2 = 24.6\%$), impact ($\beta = 0.569$, $p < 0.01$, $R^2 = 32.4\%$), meaning ($\beta = 0.241$, $p < 0.05$, $R^2 = 5.8\%$), and self-determination ($\beta = 0.522$, $p < 0.01$, $R^2 = 27.2\%$). Hypothesis 2 was fully supported with the leader-member relationship positively influencing group assignments ($\beta = 0.502$, $p < 0.01$, $R^2 = 25.2\%$).

Hypotheses 6 and 7 predicted that the degree to which a member was allocated resources would positively influence that member's performance. Hypothesis 6 was partially supported. The predicted paths between competence ($\beta = 0.320$, $p < 0.01$) and self-determination ($\beta = 0.248$, $p < 0.01$) positively influenced performance. However, the predicted paths between impact ($\beta = 0.008$, ns) and meaning ($\beta = 0.071$, ns) with performance were not statistically significant. Hypothesis 7 was fully supported, as the predicted path between group assignments and performance was statistically significant ($\beta = 0.430$, $p < 0.01$). All together, the degree to which members were allocated resources accounted for 77% of explained variation in performance.

5.4.2 Model 2

Hypotheses 3, through 6 predicted that stronger leader-member relationships would positively influence a member's development of resources. These resources were operationalized as relational capital: VWT trust, obligation, norms, and identification.

Hypothesis 3 was partially supported. The leader-member relationship predicted benevolence-based VWT trust ($\beta = 0.204$, $p < 0.05$, $R^2 = 4.2\%$) but not competence-based VWT trust ($\beta = 0.176$, $p < ns$, $R^2 = 3.2\%$). Hypothesis 4 was supported. The leader-member relationship predicted the formation of VWT obligation ($\beta = 0.510$, $p < 0.01$, $R^2 = 26\%$).

Table 18: Summary of Paths - Model 1

Path	B	SD	t	Significance
Age -> Performance	0.051	0.051	0.999	ns
Guild Tenure -> Performance	0.040	0.060	0.661	ns
Hours Spent -> Performance	0.125	0.054	2.290	p < 0.05
LMX -> Emp_Competence	0.496	0.071	7.002	p < 0.01
LMX -> Emp_Impact	0.569	0.060	9.561	p < 0.01
LMX -> Emp_Meaning	0.241	0.094	2.568	p < 0.05
LMX -> Emp_SelfDetermination	0.522	0.065	8.018	p < 0.01
LMX -> Group_Assignment	0.502	0.063	7.973	p < 0.01
Emp_Comp -> Performance	0.320	0.069	4.662	p < 0.01
Emp_Imp -> Performance	0.008	0.064	0.123	ns
Emp_Meaning -> Performance	0.071	0.054	1.311	ns
Emp_SelfD -> Performance	0.248	0.081	3.067	p < 0.01
Group_Assignment -> Performance	0.430	0.051	8.381	p < 0.01

Figure 8: Path Model - Model 1

Hypothesis 5 was supported. The leader-member relationship predicted the awareness of VWT norms ($\beta = 0.585$, $p < 0.01$, $R^2 = 34.2\%$). Hypothesis 6 was supported. The leader-member relationship predicted the formation of VWT identification ($\beta = 0.458$, $p < 0.01$, $R^2 = 21\%$) and VWT organizational identity strength ($\beta = 0.223$, $p < 0.05$, $R^2 = 5\%$).

Hypotheses 9 through 12 predicted that the degree to which members developed relational capital would positively influence members' performance. Hypothesis 9 was partially supported. The predicted path between benevolence-based trust ($\beta = 0.320$, $p < 0.01$) significantly influenced performance but the predicted path between competence-based trust and performance did not ($\beta = 0.006$, *ns*). Hypothesis 10 was supported. VWT obligation significantly influenced performance ($\beta = 0.531$, $p < 0.01$). Hypothesis 11 was not supported. VWT norms was not significantly related to performance ($\beta = -0.034$, *ns*). Hypothesis 12 was partially supported. The predicted path between VWT identification ($\beta = 0.350$, $p < 0.01$) significantly influenced performance. However, contrary to expectations, VWT organizational identity strength negatively influenced performance ($\beta = -0.280$, $p < 0.05$). All together, the degree to which members developed relational capital accounted for 72.9% of explained variation in performance.

Table 19: Summary of Paths - Model 2

Path	β	SD	t	Significance
Age -> Performance	-0.080	0.060	1.351	ns
Guild Tenure -> Performance	0.244	0.076	3.195	$p < 0.01$
Hours Spent -> Performance	0.209	0.074	2.816	$p < 0.05$
LMX -> Trust_B	0.204	0.093	2.202	$p < 0.05$
LMX -> Trust_C	0.178	0.188	0.943	ns
LMX -> Obligation	0.510	0.058	8.831	$p < 0.01$
LMX -> Norms	0.585	0.066	8.839	$p < 0.01$
LMX -> Identification	0.458	0.090	5.059	$p < 0.01$
LMX -> Identity_Strength	0.223	0.109	2.052	$p < 0.05$
Trust_B -> Performance	0.281	0.098	2.867	$p < 0.05$
Trust_C -> Performance	0.006	0.112	0.054	ns
Obligation -> Performance	0.531	0.072	7.335	$p < 0.01$
Norms -> Performance	-0.034	0.090	0.376	ns
Identification -> Performance	0.350	0.084	4.155	$p < 0.01$
Identity_Strength -> Performance	-0.280	0.114	2.444	$p < 0.05$

Figure 9: Path Model - Model 2

5.4.3 Model 3

As stated above, the full model was tested to assess the stability of the results. For this model, 500 samples sets were created to obtain 500 estimates of each of the hypothesized relationships. The results for each hypothesized relationship were unchanged, suggesting that even though the sample size is small, the results are robust. Hypotheses 1 and 2 remained fully supported. The leader-member relationship positively influenced competence ($\beta = 0.495$, $p < 0.01$, $R^2 = 24.5\%$), impact ($\beta = 0.568$, $p < 0.01$, $R^2 = 32.3\%$), meaning ($\beta = 0.243$, $p < 0.05$, $R^2 = 5.9\%$), self-determination ($\beta = 0.522$, $p < 0.01$, $R^2 = 27.4\%$), and group assignments ($\beta = 0.499$, $p < 0.01$, $R^2 = 24.9\%$).

Hypothesis 3 remained partially supported. The leader-member relationship positively influenced benevolence-based VWT trust ($\beta = 0.198$, $p < 0.05$, $R^2 = 3.1\%$), but not competence-based VWT trust ($\beta = 0.176$, $p < ns$, $R^2 = 3.2\%$). Hypothesis 4 remained supported. The leader-member relationship positively influenced the formation of VWT obligation ($\beta = 0.512$, $p < 0.01$, $R^2 = 26.2\%$). Hypothesis 5 remained supported. The leader-member relationship positively influenced the formation of VWT norms ($\beta = 0.586$, $p < 0.01$, $R^2 = 34.3\%$). Hypothesis 6 remained supported. The leader-member relationship positively influenced the formation of

VWT identification ($\beta = 0.458$, $p < 0.01$, $R^2 = 21\%$) and VWT organizational identity strength ($\beta = 0.219$, $p < 0.05$, $R^2 = 4.8\%$).

Hypothesis 7 and 8 remained partially supported. Competence ($\beta = 0.230$, $p < 0.01$), self-determination ($\beta = 0.219$, $p < 0.01$), and group assignments ($\beta = 0.241$, $p < 0.01$) positively influenced performance. However, the predicted paths between impact ($\beta = -0.096$, *ns*) and meaning ($\beta = 0.068$, *ns*) with performance remained statistically insignificant. Hypothesis 9 remained partially supported. Benevolence-based trust ($\beta = 0.187$, $p < 0.05$) significantly influenced to performance, whereas competence-based trust did not ($\beta = -0.025$, *ns*). Hypothesis 10 remained supported. VWT obligation significantly influenced performance ($\beta = 0.286$, $p < 0.01$). Hypothesis 11 remained unsupported. VWT norms did not significantly influence performance ($\beta = -0.064$, *ns*). Hypothesis 12 remained partially supported. VWT identification ($\beta = 0.205$, $p < 0.05$) significantly influenced performance. Again, contrary to expectations, VWT organizational identity strength negatively influenced performance ($\beta = -0.186$, $p < 0.05$).

All together, the degree to which members were allocated and developed resources accounted for 83% of explained variation in performance. Table 21 provides a summary comparison of Models 1, 2, and 3, and table 22 provides a summary of hypothesis testing.

5.4.4 Alternative Models

The link between LMX and performance is well established in the literature (Gerstner & Day, 1997; Graen & Uhl-Bien, 1995; Schriesheim et al., 1999). As the purpose of this dissertation was to examine *how* leader-member relationships impact performance, this link was not explicitly tested. However, in order to further validate the findings from model 3, a test of two alternative models to assess the predictive power of the mediating variables was conducted.

Table 20: Summary of Paths - Model 3

Path	B	SD	t	Significance
Age -> Performance	0.045	0.049	0.920	ns
Guild Tenure -> Performance	0.120	0.060	1.988	p < 0.1
Hours Spent -> Performance	0.146	0.056	2.587	p < 0.05
LMX -> Emp_Comp	0.495	0.074	6.653	p < 0.01
LMX -> Emp_Imp	0.568	0.062	9.175	p < 0.01
LMX -> Emp_Meaning	0.243	0.113	2.156	p < 0.05
LMX -> Emp_SelfD	0.522	0.066	7.974	p < 0.01
LMX -> Group_Assignment	0.499	0.066	7.576	p < 0.01
LMX -> Trust_B	0.198	0.094	2.108	p < 0.05
LMX -> Trust_C	0.176	0.185	0.954	ns
LMX -> Obligation	0.512	0.059	8.683	p < 0.01
LMX -> Norms	0.586	0.061	9.600	p < 0.01
LMX -> Identification	0.458	0.088	5.228	p < 0.01
LMX -> Identity_Strength	0.219	0.093	2.366	p < 0.05
Emp_Comp -> Performance	0.230	0.077	2.996	p < 0.01
Emp_Imp -> Performance	-0.096	0.073	1.317	ns
Emp_Meaning -> Performance	0.068	0.064	1.067	ns
Emp_SelfD -> Performance	0.219	0.071	3.101	p < 0.01
Group_Assignment -> Performance	0.241	0.064	3.765	p < 0.01
Trust_B -> Performance	0.187	0.080	2.326	p < 0.05
Trust_C -> Performance	-0.025	0.083	0.304	ns
Obligation -> Performance	0.286	0.080	3.574	p < 0.01
Norms -> Performance	-0.064	0.068	0.936	ns
Identification -> Performance	0.205	0.073	2.820	p < 0.05
Identity_Strength -> Performance	-0.186	0.074	2.504	p < 0.05

Figure 10: Path Model - Model 3

Table 21: Summary of Paths - All Models

	Model 1	Model 2	Model 3
Path	β	β	B
Age -> Performance	0.051	-0.080	0.045
Guild Tenure -> Performance	0.040	0.244***	0.120*
Hours Spent -> Performance	0.125**	0.209**	0.146**
LMX -> Emp_Competence	0.496***		0.495***
LMX -> Emp_Impact	0.569***		0.568***
LMX -> Emp_Meaning	0.241**		0.243**
LMX -> Emp_SelfDetermination	0.522***		0.522***
LMX -> Group_Assignment	0.502***		0.499***
LMX -> Trust_B		0.204**	0.198**
LMX -> Trust_C		0.178	0.176
LMX -> Obligation		0.510***	0.512***
LMX -> Norms		0.585***	0.586***
LMX -> Identification		0.458***	0.458***
LMX -> Identity_Strength		0.223**	0.219**
Emp_Comp -> Performance	0.320***		0.230***
Emp_Imp -> Performance	0.008		-0.096
Emp_Meaning -> Performance	0.071		0.068
Emp_SelfD -> Performance	0.248***		0.219***
Group_Assignment -> Performance	0.430***		0.241***
Trust_B -> Performance		0.281**	0.187**
Trust_C -> Performance		0.006	-0.025
Obligation -> Performance		0.531***	0.286***
Norms -> Performance		-0.034	-0.064
Identification -> Performance		0.350***	0.205**
Identity_Strength -> Performance		-0.280**	-0.186**
* p < 0.1, ** p < 0.05, *** p < 0.01			

Table 22: Summary of Hypothesis Testing

Hypothesis	Path	Predicted Direction	Support
H1	LMX -> Emp_Competence	+	Full
	LMX -> Emp_Impact	+	
	LMX -> Emp_Meaning	+	
	LMX -> Emp_SelfDetermination	+	
H2	LMX -> Group_Assignment	+	Full
H3	LMX -> Trust_B	+	Partial
	LMX -> Trust_C (<i>ns</i>)	+	
H4	LMX -> Obligation	+	Full
H5	LMX -> Norms	+	Full
H6	LMX -> Identification	+	Full
	LMX -> Identity_Strength	+	
H7	Emp_Comp -> Performance	+	Partial
	Emp_Imp -> Performance (<i>ns</i>)	+	
	Emp_Meaning -> Performance (<i>ns</i>)	+	
	Emp_SelfD -> Performance	+	
H8	Group_Assignment -> Performance	+	Full
H9	Trust_B -> Performance	+	Partial
	Trust_C -> Performance (<i>ns</i>)	+	
H10	Obligation -> Performance	+	Full
H11	Norms -> Performance (<i>ns</i>)	+	No
H12	Identification -> Performance	+	Partial
	Identity_Strength -> Performance (opposite of hypothesized)	+	

The first alternative model examines the impact of the leader-member relationship on performance, and the second alternative model examines all the hypothesized paths in model 3, but with an additional direct path between the leader-member relationship and performance. Based upon these two models, evidence suggests that the mediating resource variables proposed fully-mediate the LMR to performance relationship. This was demonstrated by confirming the impact of the leader-member relationship on performance was fully mediated by the allocation and development of resources, as well as the large increase in explained variance between the alternative models. These results are summarized in table 23.

Table 23: Summary of the Evaluation of Alternative Models

	Alternative Model 1	Alternative Model 2
R²	48%	83.6%
Path	β	β
Age -> Performance	-0.108*	0.054
Guild Tenure -> Performance	-0.01	0.067
Hours Spent -> Performance	0.290***	0.156***
LMX -> Emp_Competence		0.495***
LMX -> Emp_Impact		0.568***
LMX -> Emp_Meaning		0.243*
LMX -> Emp_SelfDetermination		0.522***
LMX -> Group_Assignment		0.500***
LMX -> Trust_B		0.196*
LMX -> Trust_C		0.176
LMX -> Obligation		0.513***
LMX -> Norms		0.586***
LMX -> Identification		0.459***
LMX -> Identity_Strength		0.218*
LMX -> Performance	0.625***	0.133 (ns)
Emp_Comp -> Performance		0.238***
Emp_Imp -> Performance		-0.123
Emp_Meaning -> Performance		0.058
Emp_SelfD -> Performance		0.220***
Group_Assignment -> Performance		0.214***
Trust_B -> Performance		0.170*
Trust_C -> Performance		-0.023
Obligation -> Performance		0.271***
Norms -> Performance		-0.089
Identification -> Performance		0.191*
Identity_Strength -> Performance		-0.182*

* p < 0.1, ** p < 0.05, *** p < 0.01

CHAPTER 6

DISCUSSION AND CONCLUSION

6.1 Overview

The purpose of this chapter is to review the dissertation study and to discuss the results from the data analysis. The chapter is organized as follows. First, the purpose of the study and the results from the empirical analysis are presented in order to frame the subsequent discussion. Second, the theoretical implications of the results are discussed. In particular, the focus is on how the empirical findings may offer new theoretical insights into how the leader-member relationship influences individual performance. Third, implications for practitioners seeking to understand how to lead and manage VWTs are discussed. Fourth, the limitations of the present study and exciting opportunities for future research are presented. Lastly, this chapter concludes with final remarks.

6.2 Review of Purpose and Findings

As individual member performance has a direct impact on the shared outcomes of the VWT as a whole, the purpose of this study was to examine how the relationships between leaders and members impacted members' performance. Underpinned by LMX theory, it was hypothesized that the quality of the leader-member relationship would have a direct impact on the 1) allocation of resources to the member and 2) development of resources by the member. The allocation of resources was operationalized as member perceptions of empowerment and VWT assignments. The development of resources was operationalized as relational capital with the team. Together, higher resource levels were hypothesized to have a positive influence on member performance.

This dissertation focused on leader-member relationships in one virtual world team, and survey data was collected in a field study of an established guild in the MMOG Everquest. Target respondents included the guild leader, guild officers and guild members. To guard against common method bias, data collection procedures included assessing the independent and dependent variables at different points in time through different instruments. These data were combined with objective data collected from logs of actual guild activities. Given its robustness to smaller sample sizes, tolerance for multi-collinearity and non-normally distributed data, PLS

was utilized to assess the measurement and structural models (Chin, 1998b; Chin & Newsted, 1999).

Overall, support was generally strong for the hypotheses predicting that the quality of the leader-member relationship would positively influence the allocation and development of resources (Hypotheses 1 – 6). Higher quality leader-member relationships significantly influenced all of the allocation of resource components (Hypothesis 1 & 2) and nearly all of the relational capital constructs (Hypotheses 3 - 6). However, hypothesis 3 was only partially supported, as the leader-member relationship did not significantly influence competence-based trust. For the hypothesized paths between resources and member performance, there was partial support. Hypotheses 7 and 8, which predicted that higher levels of member empowerment and better group assignments would lead to higher levels of member performance, were partially supported. The remaining hypotheses (9 – 12) predicted that members who developed higher levels of relational capital (trust, obligation, norms, and identification) would perform better. Hypotheses 9, 10, and 12 were partially supported, whereas hypothesis 11 (norms) was not.

Notably, the leader-member relationship significantly influenced nearly all of the mediating variables for this study. However, not all of the resource variables significantly influenced member performance. Furthermore, findings suggest that the leader-member relationship does not have a direct impact on member performance, rather the leader-member relationship influences the level of member resources, and it is these resources that impact member performance. Simply put, this dissertation study makes two important theoretical contributions by demonstrating that member resources mediate the relationship between the leader-member relationship and member performance, and helps tease apart which of these resources may be of most theoretical and practical significance. The following sections review the findings from this dissertation study in detail from theoretical and practical standpoints. These findings may improve our understanding of LMX theory and the complicated task of leading in VWTs.

6.3 Implications for Theory

Hypotheses 1 and 2 predicted that higher quality leader-member relationships would positively influence the degree to which members were allocated resources. Members assessed their perceptions of the allocation of resources (operationalized as empowerment) and resource

allocations were also objectively measured in terms of group assignments. In terms of perceptions, using Spreitzer's (1995) multi-dimensional conceptualization of empowerment, members' perceptions of 1) self-competence, 2) impact on VWT activities, 3) personal meaning associated with VWT activities and 4) self-determination over VWT activities were measured. The leader-member relationship significantly influenced all four dimensions of empowerment.

However, comparing the explained variance (R^2) for each of these dimensions offers one interesting insight – while the leader-member relationship explained a good deal of variance in members' perceptions of self-competence, impact and self-determination (24.5 to 32.3%), it only explained 5.9% of the variance in perceptions of personal meaning. This suggests that the leader-member relationship may not have a large impact upon the meaning members derive from the jobs they are performing. While not tested in this dissertation study, alternative explanations for this observation may include the explanatory role of intrinsic motivations, individual differences, or differences in individual motivations to participate in VWTs. For instance, some reasons which could impact the meaning members associate with VWT activities could include personal achievement, socially-oriented goals, and immersion-oriented goals (Yee, 2006a). Therefore, while the findings suggest that the degree to which one finds their job meaningful may be partially influenced by the relationship with the leader, it is also clear that there are other influential factors to consider.

Another possibility is that personal meaning lacks construct validity as an assessment of the allocation of resources, even though it is often included in empowerment research. Further evidence for this explanation is that personal meaning did not have a significant impact on member performance (discussed in more detail below). Therefore, theoretically this suggests that while personal meaning may be related to empowerment, it does not actually reflect the theoretical construct of interest in this dissertation – the allocation of resources to members. Further support indicating that meaning is not an assessment of resources is the finding that meaning does not influence performance.

Also for Hypothesis 2, an objective measure assessing allocation of resources (group assignments) was created based upon the coding of five and a half weeks of the VWT log data. As predicted, the quality of the leader-member relationship significantly influenced the degree to which members were assigned to better groups, consisting of individuals with complementary

skills. These findings add rare objective empirical support for the general tenants of LMX theory which suggest that in-group subordinates generally receive better job assignments.

Hypotheses 3 through 6 predicted that higher quality leader-member relationships would positively influence the development of VWT resources in terms of relational capital, consisting of trust-benevolence, trust-competence, obligation, norms, identification, and identity strength. Trust in other VWT members was initially conceptualized using the benevolence, integrity, and competence dimensions suggested by Mayer (1995). However, the integrity dimension had to be dropped due to poor measurement properties. Hypothesis 3, suggesting that higher-quality leader-member relationships would influence the development of trust was partially supported, with a significant influence on benevolence-based VWT trust but not competence-based VWT trust.

These findings suggest that the extent to which the leader-member relationship may influence the development of VWT trust varies based upon the type of trust examined. It appears easier for leaders to influence members to trust in the benevolence of others than to assure members that they are surrounded by competent colleagues. Furthermore, regardless of the type of trust, the leader-member relationship explained only about 3% of the variance for either. In order to shed light on these findings, the results were presented to several members of the VWT. One member observed, “There’s no need [for] my leader to tell me if someone is awesome or a [censored] or an idiot I can see it for myself. Like if I know this person slacks on raids or cheats using hacks or is dishonest, it doesn’t matter what the leader says. I still don’t trust them to do their job or not to put their own interests above the guild first.”

The findings from hypothesis 3 and the post-hoc comments provide some interesting insights for theory. For example, the literature is very clear with regards to linking trust (of all types) to the successful functioning of virtual teams (Jarvenpaa & Leidner, 1999; Jarvenpaa et al., 1998; Martins et al., 2004; Powell et al., 2004). In fact, many authors also suggest that leaders play a key role in the development of trust (Jarvenpaa & Tanriverdi, 2003; Kayworth & Leidner, 2000; Lim & Ployhart, 2004; Uhl-Bien et al., 2000; Zaccaro & Bader, 2003). The findings from this dissertation suggest that *this leadership role may be limited*, and that perceived trustworthiness is exhibited through action. In VWTs, unlike online/virtual teams, all of the actions of team members are easily observable and recorded for later review. In contrast, virtual teams that rely on text-based, asynchronous communications limit the visibility of team

member actions to those specifically contributed by each team member. Furthermore, text-based, asynchronous communications are rehearsable, so that team members can self-sensor before publicly communicating with other team members. Given the emphasis granted to trust-based research in the virtual team context, an interesting twist to VWTs is that trust is not needed when members can engage in direct observation of each other's actions.

Hypotheses 4 through 6 examined the impact of leader-member relationships on the member development of obligation, norms, and identification with the VWT. Identification was measured in two ways, using organizational identification and organizational identity strength measures. These hypotheses were all supported, providing empirical evidence for the propositions linking LMX and relational capital (Uhl-Bien et al., 2000). As evidenced by the R^2 values, the leader-member relationship explained a great deal of variance in which members felt the weight of obligations to participate in raids and to help other members in need ($R^2 = 26.2\%$), the extent to which members were aware of the rules and norms regarding participation and interaction ($R^2 = 34.3\%$), and the extent to which members identified with the VWT ($R^2 = 21.0\%$). However, while still statistically significant, the extent to which the leader-membership relationship influenced members' perceptions of the unity and shared vision of the VWT was lesser ($R^2 = 4.8\%$). One possible interpretation for this finding, similar to the personal meaning variable discussed above, is that member's perceptions of the strength of the VWT's identity as a whole may lack construct validity as an assessment of team member resources. Another possible explanation is that members of the same VWT may disagree on which goals to pursue. Some may prefer to advance their own avatars, while others want to explore the new content and quests, while yet others wish to progress as quickly and obtain resources (e.g., loot) from the new raids available. These divergent goals may have impacted the degree to which VWT members perceived the unity and shared vision of the guild.

Hypotheses 7 and 8 predicted that the degree to which a member was allocated resources would have a direct impact on performance. These hypotheses were partially supported. Two of the dimensions of empowerment: competence and self-determination had a positive influence on performance. Also, better group assignments had a large and positive influence on performance. Contrary to expectations, the other two empowerment dimensions, meaning and impact, were not significantly related to performance.

What the findings from hypotheses 7 and 8 suggest is that members performed better when they felt more self-confident, had more latitude in how they performed their jobs, and when allocated better group/work assignments. When presented with these findings, one leader confirmed, “It’s hard to micromanage this many people at the same time when you can’t always see what they’re doing [during the raid]. It’s much easier to trust that people know what to do and let them do it in their own style.”

However, the extent to which members felt that their jobs were personally meaningful or that they had an impact on the VWT as a whole, did not predict performance. Another member noted, “For meaning, everyone pretty much feels the same. We all sacrifice our time and miss stuff irl [in real life] to raid. If we didn’t think this was worthwhile, we wouldn’t be here. But that by itself probably doesn’t mean that everyone gives 100% always.” That personal meaning did not influence performance was an unexpected finding especially given the voluntary nature of participation with this particular VWT. The above comment indicates that individual participation in raids is subject to opportunity costs. However the comment further suggests that while meaning may motivate individuals to show up to raids; by itself, meaning does not motivate individuals to perform above and beyond some minimal level of performance.

In terms of the non-significant relationship between perceptions of individual impact on the VWT, one member commented, “Everyone has a job to do, I hate people who have egos and have to be the center of everything. Those guys always end up flaming out [quitting] because with 50+ people they can’t always win the parse [have the best objective performance].” Implied by this comment, is that what may be valued by this VWT are individuals who perform their roles without the need for receiving personal accolades. Consistent with the attraction-selection-attrition (ASA) framework (Schneider, Goldstein, & Smith, 1995), individuals who are motivated to perform by a need to perceive that they have a large impact on VWT outcomes self-select themselves out of this particular VWT. This line of reasoning provides one plausible explanation for why perceived impact did not influence performance.

Hypotheses 9 through 12 examined the impact of relational capital on performance. Hypothesis 9 was partially supported, with benevolence-based trust positively influencing performance but not competence-based trust. Theoretically, this finding suggests that the type of trust, in particular benevolence-based trust, matters for member performance. When asked to explain why competence-based trust did not influence performance, one member replied “There

may be many reasons. I assume when an invite [new member] makes it through the invite process to [become a] fm [full member], they know what the [censored] to do and they already have the appropriate skill level. We normally have pretty good people in this guild, otherwise how could we do well?” While this reply suggests one reason that competence-based trust did not influence performance, it is also possible that competence-based trust may simply not be a valid measure of relational capital. Hypothesis 10 was supported, with VWT obligations significantly influencing performance.

Contrary to expectations, Hypothesis 11, which predicted that norms would positively influence performance, was not supported. When asked to explain, one leader observed, “It’s not like everyone doesn’t know what’s up. We have this 100 page set of rules and procedures posted on our website. People who are new to us are usually assigned class [role] mentors who tell them what’s expected. But there’s a huge difference between knowing what to do and *actually doing it* [emphasis added]. Knowing how to get people to actually do what they’re supposed to, that’s \$\$\$ [money].” Given that the items used for this dissertation assessed only the awareness of VWT norms, this may partially explain the unexpected finding. This suggests theoretically that awareness of norms alone does not predict performance and that the extent to which individuals adhere to norms or standard operating procedures may be an influential predictor of performance.

Hypothesis 12 was partially supported. VWT identification significantly influenced performance, but VWT identity strength had a significant negative influence on performance. Put another way, the highest performers did not perceive a strong identity shared by the VWT as a whole. One plausible explanation is that organizational identity strength is more of a group variable, than a relational capital variable. If a strong organizational identity does not form at the group level, it dampens individual performance.

Taken together, the findings from hypotheses 9 through 12 help shed light into the exact causal mechanisms by which stronger leader-member relationships influence member performance. First, the findings support the propositions that the leader-member relationship influences the allocation and development of member resources, and that it is because of these resources that member performance is enhanced. This is a significant advance to LMX research that helps the theory move past the correlational “LMX plus” category two studies identified in Chapter 2. Second, the findings highlight how the leader-member relationship impacts the

allocation and development of different types of resources. As hypothesized, LMX had an influence on all the dimensions of empowerment, tangible allocation of resources, benevolence-based trust, VWT obligation, VWT norms, and VWT identification. However, given that all actions within a VWT are observable by team members, there appears little more a leader can do to influence the development of trust in VWT settings.

Third, the findings tease out the important resources for member performance: self-determination and competence, tangible allocation of resources, benevolence-based VWT trust, VWT obligations, and VWT identification. Fourth, the findings indicate that future studies should consider measuring both the awareness and adherence to norms, especially since awareness alone did not predict member performance.

6.4 Implications for Practice

This study's purpose was to answer the following question: *how do leaders influence member outcomes within virtual world teams?* Three key implications for practitioners seeking to leverage the findings from this study about the management of VWTs are discussed.

First, *coach up the members of your VWT and get out of the way*. The results of this study suggest that the leader-member relationship has an impact on the degree to which employees feel empowered to perform their roles. Two dimensions of empowerment are of particular interest as they have a direct impact on performance: 1) self-competence and 2) self-determination. Leaders should therefore focus on activities which elevate members' perceptions of competence (e.g. coaching or positive feedback), as well as avoid micro-management. When members are confident in their abilities and have the latitude to perform their roles as they choose, this "can-do" attitude can improve their performance.

Second, *give your members what they need*. Consistent with LMX theory, this study found that stronger leader-member relationships were positively related to the degree to which members were assigned better resources, in terms of group assignments. Better group assignments allowed members to take advantage of the complementary skill sets between members with different job roles. The synergistic effects derived from group diversity in turn improved the performance of members who participated more often in better groups. There are however, other managerial implications to consider.

As in real life, the degree to which resources are limited must be considered. For example, leaders oftentimes have to deal with disgruntled members who feel discriminated

against. One member observed, “Whenever I get a [censored] group, I don’t feel motivated to perform well. No matter what I do, I’m going to lose when the DPS [damage per second] parse [objective measurement of performance] is posted.” A leader noted, “You have to be careful making groups. Sometimes this person can’t get along with another and they spend the whole time [censored] with each other instead of paying attention. Also, sometimes people slack when they don’t think they have a chance to be in the top 10 on parses, other times they’ll /q [logoff in an unexpected manner]. Whenever I have to make groups I hate the tells [personal communications] I get from people [censored] about their groups.” These comments indicate the importance that resource allocation has on members’ performance and suggest that the decision on how scarce resources will be allocated should be carefully considered.

Third, *set your members free but bind them to each other*. As the literature suggests, managing large numbers of collocated avatars in a virtual world environment can be difficult due to the disruptive effects of geographical, temporal, cultural, and technology-mediated discontinuities. Based upon the results of this study, one way to lead in environments where formal control is limited is for leaders to encourage the development of relational capital among VWT members. This is because with stronger leader-member relationships, comes a transformation of members’ self-interest to a collective interest. Members are bound together tightly by durable obligations, identification with the VWT, and trust in the benevolence of team members.

When members of the VWT were asked why they continued to volunteer their time and efforts to participate on raids, a very common response was “it’s about the other people.” Building on these findings, a key way that leaders can make an impact on VWTs is to focus on building a strong *esprit de corps* in which individual members maintain positive beliefs about the larger collective. When members buy into a collective interest, the governance of VWT activities can shift from formal leader-member relationships to the enactment of or adherence to the individually-held beliefs of members. Members regulate their performance based upon the extent to which they share relational capital with the team and do not necessarily perform solely at the behest of their leaders. Given the difficulties introduced by the communications media for most CMC-enabled teams, understanding these facets of relational capital offers one possible solution for understanding how to effectively manage VWTs.

6.5 Limitations

Oftentimes, gaining access to organizations is challenging for researchers interested in examining phenomena in situ. The study of VWTs presents a similar challenge. As a valid criticism of past LMX research has been the common practice of studying small (1 – 5 members), temporary teams of student subjects (Powell et al., 2004), the goal for this dissertation was to study how LMX in large, real-world VWTs functioned. The research agreement with the VWT chosen for this study provided access to members of the VWT, as well as sources of objective data (i.e., DKP database). In total, data was collected from 61 respondents, representing 89.7% of the total population for the VWT during the sampling frame, ensuring that the majority of leader-member relationships and performance outcomes were assessed for this particular VWT. This is a significant strength of the research presented here.

However, as with any research, the study's findings should be considered in light of its limitations. For this dissertation, there are three main limitations: the small sample size, the generalizability of the findings, and possible researcher bias.

Given the sample size guidelines for PLS analysis suggested by Chin and Newsted (1999), this smaller sample size impacted the extent to which complex path models could be tested. Hypothesis testing was conducted using three models which varied in complexity. The results from the full research model (Model 3) were consistent with earlier results from the less complex models (Models 1 & 2) tested, indicating the stability of the results. However, the possibility that there was insufficient statistical power to detect small effect sizes could increase the probability of Type II errors.

The second limitation deals with the generalizability of the findings from the study. As data collection was limited to one VWT, it is difficult to conclude how generalizable the findings are to other VWTs or virtual teams which use different communications media. However, the VWT sampled bears similarity to other VWTs within the Everquest context. For example, the demographics of the respondents are consistent with what other studies have noted (e.g., Castronova, 2005; Yee, 2006a). Also, the ways VWT operate and are managed and controlled tend to be very isomorphic in nature, copying best practices observed in other leading VWTs (Williams et al., 2006). For example, the use of a "points" system to measure and to reward participation is the norm among large, raiding-oriented VWTs. Without surveying multiple VWTs however, it is difficult to definitively suggest how generalizable the results are to VWTs that do not share these characteristics.

Lastly, it should be noted that the principal investigator is a member of the VWT studied and actively participated in VWT activities during the sampling frame. This participation may have introduced possible bias in the interpretation of results or there may have been undue influence on the surveys collected. For example, respondents may have felt pressure to answer questions in a manner non-representative of how they actually perceived things. Respondents could also have felt overly obligated or coerced into participating in the study.

These concerns should be viewed in light of the purpose of this study, the procedures employed during the data collection process, and the positive benefits derived. First, the purpose of this study was to examine the outcomes of high-quality leader-member relationships in situ as research into leadership processes in VWTs remains in its infancy. The participation of the principal investigator was also necessary in order to capture the objective data logs which in combination with the subjective survey measures strengthen the validity of the overall results of the study. Also, the participation of the principal investigator was limited to activities that did not unduly influence the collected data – the investigator did not collect nor use any data that pertained to himself (i.e., taking the survey, rating other members' performance), did not reveal or discuss the specifics of the study with subjects, and was not involved in the assignment of members to groups. Lastly, the reasoning for employing a field study was to see what could be learned from how leadership in MMOGs functioned, in order to offer insight into the management of VWTs for business settings. Within the limitations of active participation, this study as discussed in the section earlier, offers some practical guidance for the management of VWTs.

6.6 Directions for Future Research

As Meacham (1983) notes, ignorance and wisdom grow hand in hand. Simply put, the limitations and findings from this study suggest interesting directions for future research. Four are discussed briefly here. First, as observed in the limitations section, a natural extension of this research would be to increase the sampling frame to include multiple VWTs and different environments. This would allow for a broader sampling of leaders and members to improve external and statistical conclusion validity. For example, future studies could expand beyond the Everquest context and survey VWTs in other virtual world types, to improve generalizability. Looking at different VWT contexts may offer ways to test the robustness of the research model utilized in this dissertation. For example, one interesting comparison would be to compare and

contrast Everquest and WoW. Specifically, in WoW where raids are much smaller (10 – 25 participants) than Everquest (54 participants), does the leader become more hands on and rely less on the development of relational capital?

Second, as identified in Chapter 2, there are many different leadership paradigms and styles. As this study concentrated on understanding the impact of leader-member relationships on member performance in isolation, it would be difficult to conclude that LMX is the most effective leadership style for VWTs. One follow-up study would be a multi-theoretical comparison of other forms of VWT leadership in conjunction with LMX. For example, the Multifactor Leadership Questionnaire by Bass and colleagues might be useful because it measures transactional (2 dimensions), transformational (5 dimensions), and passive (2 dimensions) leadership. An additional strength of utilizing the MLQ is that the survey measures include scales which ask respondents to report observed leadership behaviors. One possible study could combine the perceptions of leadership behaviors captured in the MLQ in conjunction with an analysis of log files of chat communications on raids which objectively assess leadership behaviors. A study of this nature would make a contribution to the body of VWT literature by not only helping establish what leadership styles are effective in this new environment but also offer interesting comparisons on whether it is the perceptions of leadership behaviors or actual leadership behaviors which influence performance

Third, this study focused only on one member outcome – performance. As observed in Chapter 2, studies have examined many other variables of organizational interest, for example satisfaction with supervision, overall satisfaction, job satisfaction, organizational commitment, role clarity, intentions to stay, and turnover intentions (Gerstner & Day, 1997; Van Breukelen et al., 2006; Van Seters & Field, 1990). Given the paucity of research in VWTs, studies which establish how leadership affects a variety of member outcomes are still needed. One possible follow-up study might examine organizational commitment. Organizational commitment could be objectively measured by an analysis of attendance history available in DKP systems as well as through survey measures. Also, organizational commitment could also be studied an antecedent of performance with a study with utilizing a longitudinal design.

Lastly, the findings from this study suggest that there are limitations associated with some of the mediating resources hypothesized. For example, several of the empowerment measures may not have been accurate measures of resources provided by the leader-member

relationship. Therefore, from a theoretical perspective, the examination of other mediating resources offers interesting follow-up opportunities. For example, some possible constructs to explore include job latitude (above and beyond self-determination) and access to information as additional forms of perceived and tangible resources as these could plausibly affect member outcomes. Another theoretically important follow-up study would be to further investigate the relationship between LMX and social capital beyond what is currently theorized (Uhl-Bien et al., 2000). For example, the structural and cognitive dimension of social capital proposed by Nahapiet and Ghoshal (Nahapiet & Ghoshal, 1998) remain poorly integrated with the LMX literature and there is a need for empirical investigations into how these other forms of social capital may be leveraged in the management of VWT teams.

6.7 Conclusion

The purpose of this dissertation was to examine how the leader-member relationship influences member performance. Building upon LMX theory, this study proposed that higher quality leader-member relationships would have a direct impact on the degree to which members are allocated and develop resources. Higher levels of resources enable members to perform better than their peers. Evidence from a study of 61 members of a VWT generally suggests the leader-member relationship does impact members' allocation and development of resources. Furthermore, the evidence from this study suggests that it is the quantity and the type of resources that impacts performance, not the leader-member relationship.

This research makes important contributions to understanding LMX theory as well as how to influence member performance. From a theoretical standpoint, the goal for this dissertation was to open the "black box" of LMX theory and to explore more precise causal mechanisms by which leader-member relationships impact performance. Consistent with LMX theory, the findings suggest that the leader-member relationship is important, having a positive influence on nearly all the resource variables. However, further examination helps tease out which resources are influential on member performance. In particular, two dimensions of empowerment, access to better work assignments, benevolence-based trust, obligation, and identification influenced member performance.

From a practical standpoint, this research provides guidance into what leaders may do to effectively management VWTs. For example, better member performance could be achieved through coaching and avoiding micro-management, providing members with better team

assignments, and binding VWT members to each other such that collective interest replaces self-interest. Ultimately, by studying virtual organizations that have succeeded, as they commonly do in online gaming environments where participants are volunteers, it is my hope that this research will help leaders in real life organizations management in virtual assignments that to date have been perceived as unmanageable.

APPENDIX A

IRB APPROVAL

Office of the Vice President For Research
Human Subjects Committee
Tallahassee, Florida 32306-2742
(850) 644-8673 · FAX (850) 644-4392

APPROVAL MEMORANDUM

Date: 12/9/2009
To: Samuel Goh
Address: 240 Rovetta Business Building
Dept.: MANAGEMENT INFORMATION SYSTEMS
From: Thomas L. Jacobson, Chair

Re: Use of Human Subjects in Research
The Effects of Leader-Member Exchange on Member Outcomes in Virtual Teams

The application that you submitted to this office in regard to the use of human subjects in the proposal referenced above have been reviewed by the Secretary, the Chair, and two members of the Human Subjects Committee. Your project is determined to be Expedited per 45 CFR § 46.110(7) and has been approved by an expedited review process.

The Human Subjects Committee has not evaluated your proposal for scientific merit, except to weigh the risk to the human participants and the aspects of the proposal related to potential risk and benefit. This approval does not replace any departmental or other approvals, which may be required.

If you submitted a proposed consent form with your application, the approved stamped consent form is attached to this approval notice. Only the stamped version of the consent form may be used in recruiting research subjects.

If the project has not been completed by 12/7/2010 you must request a renewal of approval for continuation of the project. As a courtesy, a renewal notice will be sent to you prior to your expiration date; however, it is your responsibility as the Principal Investigator to timely request renewal of your approval from the Committee.

You are advised that any change in protocol for this project must be reviewed and approved by the Committee prior to implementation of the proposed change in the protocol. A protocol change/amendment form is required to be submitted for approval by the Committee. In addition, federal regulations require that the Principal Investigator promptly report, in writing any unanticipated problems or adverse events involving risks to research subjects or others.

By copy of this memorandum, the Chair of your department and/or your major professor is reminded that he/she is responsible for being informed concerning research projects involving human subjects in the department, and should review protocols as often as needed to insure that the project is being conducted in compliance with our institution and with DHHS regulations.

This institution has an Assurance on file with the Office for Human Research Protection. The Assurance Number is IRB00000446.

Cc: Molly Wasko, Advisor
HSC No. 2009.3694

APPENDIX B

INFORMED CONSENT

THE FLORIDA STATE UNIVERSITY
COLLEGE OF BUSINESS

Informed Consent Documentation

This research is being conducted by Dr. Molly Wasko, Ph.D., a professor in the College of Business at Florida State University and Samuel H. Goh, Doctoral Candidate in the College of Business at Florida State University. I understand the purpose of their research project is to understand how relationship quality affects virtual team member outcomes. I understand that if I participate in the study I will be asked questions about my participation in guild activities including perceptions of leadership in the guild, my performance in the guild and of how resources are allocated and developed within the guild.

I understand I will be asked to participate in a three-part survey. The total time commitment would be 15-30 minutes for each survey. The researchers will answer any questions I have. I have the choice of not participating in the study. I understand that my consent to participate in this survey may be withdrawn at any time without prejudice, penalty, or loss of benefits to which I am otherwise entitled.

I understand my participation is totally voluntary and that I may stop participation at anytime. All my answers to the questions will be kept confidential. I understand that the results of the research may at some future time be published. Although my responses may be identifiable to the researchers, responses will be kept confidential to the extent allowed by U.S. law, and no individual responses will be reported; only summarized findings will be reported. I understand that no personally identifiable information will be retained if collected. If I agree to participate in the study, I understand that Mr. Samuel Goh will keep the responses in a locked filing cabinet. I understand that only he and any other researchers conducting this project will have access to the responses, and that they will be destroyed by Jan 1, 2012.

I understand that I may contact any of the following for answers to questions about this research or my rights. Group results will be sent to me upon my request.

Dr. Molly Wasko at mwasko@cob.fsu.edu or [850.644.0916](tel:850.644.0916)
Mr. Samuel Goh at shg06c@fsu.edu or [423.503.7190](tel:423.503.7190)
Florida State University Institutional Review Board at [850.644.8633](tel:850.644.8633)

I have read and understand this consent form. I have been given the right to ask and have answered any inquiry concerning the study. Questions, if any, have been answered to my satisfaction.

Figure 11: Informed Consent

APPENDIX C

MMOG GLOSSARY OF TERMS

AAs – Alternative abilities. AAs offer a different way to improve one’s avatar outside of levels. AAs normally grant extra abilities or enhance current skills. For example, the enduring breath AA allows one’s avatar to breathe underwater.

AFK – Short for away from keyboard, where the human controlling the avatar is away from the computer. AFKs may be announced or unannounced (by the person who needs one) and unannounced ones can have unfortunate implications for groups or raids, especially if the avatar has a key role to play (i.e. a healer). Over time, patterns of unannounced AFKs (called ninja-afk’ing) can have a severe negative reputational impact for a participant displaying such behavior and also negatively affects the degree of trust afforded and perceived performance of said participant.

Archetype – A taxonomy used to combine several classes according to a common characteristic. Common archetypes in Everquest revolve around loot (e.g. light armor archetype consists of classes which wear leather or chain armor) or around their roles on raids (e.g. tank, healer, dps, support).

Buff – A beneficial spell which increases the statistics or abilities of an avatar. Buffs can be self (affecting ones avatar alone) or targetable (may be cast on other avatars). Buffs can significantly influence the power of avatars and which buffs are accessible depends on the availability of buffing classes. For example, clerics, druids, and enchanters all have unique, desirable buffs which are needed.

Camping – Refers to the act of an avatar or group staying at one location within a MMOG and performing a repetitious task.

Class – The chosen profession of an avatar. In Everquest, there are 16 possible classes: Bard, Beastlord, Berserker, Cleric, Druid, Enchanter, Magician, Monk, Necromancer, Paladin, Ranger, Rogue, Shadow Knight, Shaman, Warrior, and Wizard. Class balance, or having the appropriate combinations and numbers of avatars of different classes, is necessary for raiding guilds to survive.

Crowd control – a strategy used to control large numbers of mobs (monster opponents) and to “divide and conquer”. Usually only support classes, such as enchanters, have the ability to cast spells which serve this function.

DKP system – DKP is short for “dragon kill point” (the name of the “points” may vary between guilds). A player-derived system which the majority of raiding guilds have adopted due to the

scarcity of loot, the DKP system is a method for a guild to track DKPs and revolves around the central idea of how loot obtained through raids may be fairly distributed to guild members. A DKP system is the opposite of other loot allocation systems such as “merit”. A DKP system has many parallels with real world compensation systems and guild members earn points for contributions to the guild (e.g., points awarded hourly or for successful completion of raids) which may be later redeemed for loot. One notable difference between a DKP system and real life compensation has to do with the way individuals with avatars of different classes and skill sets earn rewards. The egalitarian approach inherent in most DKP systems, where everyone earns the same DKP amount for participating, stands in stark contrast to how real life job occupations (e.g. doctor versus barhop) affect compensation rates. This approach reflects that participation in raiding activities is of a voluntary nature and recognizes that perceptions of equality between guild members are prized as a motivational tool for encouraging raiding participation. DKP systems require extensive maintenance both in-game and in real life. As no MMOGs directly offer DKP solutions, a database to store a guild’s raiding activities has to be created by a guild and maintained outside of the MMOG (usually using client/server technologies where access is available to guild members via password-protected accounts). Internally, the guild also has to coordinate short term activities such as designating responsible parties for transforming and entering in-MMOG logs of participation into the DKP database, negotiating points awarded for participation and pricing loot, as well as developing transparent methods by which bidding for loot will be achieved. Long term planning is also required, as issues such as DKP inflation (where the amount of DKP amassed by longer-term participants builds up to high levels) can negatively affect recruitment efforts because prospective guild members fear the length of time it would take to buy loot. Naturally, complex rules which evolve and are refined over time exist at the guild level about a DKP system (e.g., the rules governing DKP for the guild studied in this research spans 10 pages of text).

DPS – Damage per second. As an archetype, DPS avatars are important for defeating enemies using melee, ranged attacks, or spells. As a trade-off, most DPS avatars are unable to take very much damage and require the protection of tanks and healing. Some examples include wizards, magicians, monks, rangers, necromancers, beserkers, and rogues.

Flagging – Access to more advanced zones tend to be limited in MMOGs. An avatar seeking to access these restricted zones has to first earn a flag which allows passage. Flags may be obtained by a variety of methods, for example a “key quest” to gain a key to unlock the door leading to the next zone.

Grouping – Small-scale collaboration between MMOG participants in which several individuals band together for a common cause. Grouping is generally encouraged by the rules of MMOGs as MMOG providers recognize collaborations between players as a way to build loyalty among their customer base – after all, what fun is an empty virtual world where you play by yourself? Some motivations for grouping include xp’ing, questing, flagging, camping, or for reasons of socializing. While most groups tend to be ad-hoc and time-limited in nature, it is not uncommon

for group histories to develop over time where participants seek each other out for future groups. These relationships can be beneficial for people who group, for example access to a network of other participants is a key way by which information flows in a MMOG. Also, access to stronger relationships and the network of participants derived from grouping, are often the building blocks for the formation of guilds.

Guild – A player-founded organization to create a more permanent social structure. Guilds can range in size and their purposes may be different, ranging from socially-oriented to raiding-oriented intents. The composition of guilds can be rather complex and includes a formal hierarchy. For example the person starting the guild, or the guild leader, has the formal authority. The guild leader may promote guild officers who have authority associated with their position but defer to the guild leader. Rank and file guild members comprise the core of the guild. Guild invites are temporary members who are attempting to gain guild membership. Guild membership procedures vary between guilds but it is commonplace for guild invites to go through an “invite period” in which their performance and personalities are evaluated for fit with the overall guild.

Healer – Avatars who have the ability to heal other avatars via spells. Can neither do nor take much damage and therefore require tanks for protection and DPSers to dispatch enemies. Some examples include clerics, shaman, and druids.

Loot – the tangible reward associated with the completion of a quest or raid. Loot is a very important motivation for continued play by MMOG participants and scarce loot is a very big source of contention within guilds. Loot could be items which may be obtained in-game and strengthen one’s avatar (e.g. armor or weapons) or standing (e.g. gold and jewels).

Merit System – A loot allocation method by which loot is awarded to the guild member who most deserves it. Depending on the system, this decision may be made by guild members of the same class, guild officers, the guild leader, and even the entire guild. Influential decision-making factors include skill, class and role of the member, past attendance, and past loot. Due to the perceived subjective nature of this system, many guilds adopt DKP systems, seen as more objective and transparent methods of allocating loot.

MMORPG – Short for Massively-Multiplayer Online Role-Playing Game, a MMORPG is a virtual world in which participants or players may interact and play in a variety of settings or genres.

Quest – A task within a MMOG which may be performed solo or with others. Oftentimes, a quest involves an engaging narrative including a back story along with an adventure that unfolds as the questing continues. Quests normally have rewards for individuals which undertake them (e.g. loot or xp).

Raid – Large-scale collaboration between MMOG participants which range in size from tens to hundreds of participants (In Everquest, raids are designed for 54 participants). Raids may be PU (pick-up or ad-hoc), guild-only, or alliance (several guilds together with common purposes). Raids require extensive coordination of participants, with many simultaneous tasks that have to be accomplished and having proper class balance is essential to success. Raids can take as little as 30 minutes up to several hours to complete. Learning how a raid works can take as little as several days up to several months of efforts by a guild.

Rez – Short for resurrect. The act of resurrecting a slain avatar.

Soloing – when an individual plays by his or herself.

Support – Avatars who cast beneficial buffing spells as well as have capabilities which enhance other avatars abilities. Support classes are the least self-sufficient avatars and require tanks to protect them, healers to heal them, and DPSers to dispatch enemies. Due to their buffing and complementary skills however, they are highly sought after to “make others better”. Some examples include enchanters and bards.

Tank – An avatar geared towards close-ranged melee combat, utilizes armor that provides maximum protection, have aggro-management skills, and have statistics geared towards absorbing damage (e.g. high hitpoints). Some examples include warriors, paladins, and shadow-knights.

Tell – a one-on-one personal communication between two individuals.

Veterancy – Used to describe older, more experienced units or avatars.

Xp'ing – Player slang for “experiencing”. Following the role-playing roots of most MMOGs, one's avatar may be improved by gaining experience. Experience may be awarded by performing quests or killing monsters in the MMOG. When an appropriate amount of experience is earned, an avatar may gain levels which improve the tangible performance and capabilities of the avatar. Leveling is an important motivation for people to continue xp'ing as participants commonly compete to see who can gain the more levels faster (called powerlevelling) and serves as a yardstick by which to compare ones avatar versus others.

Zone – A separate and distinct physical location within a MMOG. Originally devised as a way for MMOG providers to optimize server loads by having more popular zones load-balanced across several server farms, zones have become an integral way for participants to identify their avatar's location within a MMOG. As virtual worlds may be very large (e.g. it would take hundreds of hours for one's avatar to traverse every location in Everquest), zone information is required to coordinate grouping or raiding activities.

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BIOGRAPHICAL SKETCH

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