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The Nature and Influence of Relationship on Success in a Virtual Work Environment

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THE NATURE AND INFLUENCE OF RELATIONSHIP ON SUCCESS IN A VIRTUAL WORK ENVIRONMENT

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Dedication

I was the benefactor of outstanding examples of dedication to family, unconditional love, and a solid heritage of inspirational leadership.

This work is dedicated to the memory of those who were my rock and inspiration, including my father (John Walter Locher), mother (Joanne Marie Spain Locher), and grandmothers (Charlotte Erxmeyer Locher Patterson and Marie Antoinette Collins Spain). It is also dedicated to my extraordinary daughters (Catherine Elizabeth Ransone and Emily Marie Ransone), who have grown into outstanding women of whom I am so proud. The connection between the three of us is something I will forever cherish.

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The word "supported" has many synonyms that describe what I have experienced over the years. I've been reinforced, maintained, buoyed, sustained, and held. For that I am so very grateful. And I do believe it was divine providence that led me to and through this amazing journey. I would like to acknowledge the efforts of this vast collective to whom I am forever indebted.

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Thank you, Antioch University, for the gift of vision, knowledge, and purpose. This includes the remarkable faculty, staff, and scholars who have provided a wonderful learning environment.

And to those who have guided me along the dissertation path, especially: My dissertation chair, Dr. Elizabeth Holloway, whose wealth of knowledge and patient guidance encouraged and sustained me through this process. Methodologist extraordinaire, Dr. Carol Barron, whose dedication to design and analysis served to capably guide me throughout this study. Dr. Laurien Alexandre, whose energy and inspiration served as a constant beacon throughout my journey. Dr. Ron Rabin, who served as my external reader. He provided wonderful insight, especially in the area of virtual teams. Deb Baldwin, who shared invaluable insight and expertise into the heretofore mystery of research processes. Shannon Kenny, whose attention to detail and enthusiasm provided expert advice on scholarly writing. Cohort 10, especially the "Magnificant 7" ProSem group who have been sisters in the journey and will be forever friends.

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Lastly, my deepest appreciation goes to my family and friends who have categorically "been there" for me. In addition to those recognized in my dedication, I would like to thank my brother (Eric Joseph Locher), aunt (Mary Susan Bane), godmother and aunt (Marcia Ann Lowder), uncle, a plethora of fabulous cousins, sister-in-law, nephews, and my "mother-in-love" (Caroline Harrell Ransone). And to the many dear friends who over the years have become and continue to stay close to my heart.

Bentz and Shapiro (1998) relayed that there are:

four primary functions of scholarly inquiry for the scholarly professional:

- Personal transformation;
- An improvement of professional practice;
- The generation of knowledge;
- And appreciation of the complexity, intricacy, structure, and—some would say—beauty of reality. (p. 68)

This has been an amazing journey of transformation and growth. I am humbly blessed as I look forward with awe and excitement at how much more is yet to come!

Abstract

The evolution of technology in the 21st century has led to a greater understanding of the benefits and the challenges of expanding work relationships across geographical boundaries. This expansion has contributed to the development of a global society with over three million employee teleworkers (Global Workplace Analytics and the Telework Research Network, 2013). In spite of the advances in connecting across the globe technologically, the importance of successfully working together in a virtual work environment is grounded in relationships that foster individual growth and group cohesion. The human elements of connectivity are primary to the success of organizations as well as fulfillment of the individual. This study explores the importance of relationship within the world of virtual work and investigates the various aspects of virtual work environments to understand overall virtuality. The Relational Health Indices (RHI) were used as a foundation to build the means for measuring relationship quality among teammates. These were then explored as a means to provide insight into the importance of relationship within the world of virtual work. The primary research question for this study was: "What is the nature and influence of relationship on success in a virtual work environment?" Success is defined here as perceived team goal achievement, job satisfaction, and relationship satisfaction. The research design consists of a mixed-methods, descriptive, and correlational study looking at the nature and influence of relationship on success in a virtual work environment based on a hierarchical multiple regression analysis of data collected from an online survey. A content analysis of participant responses to open-ended survey questions was employed. Major findings include: the development of a tool to measure relationship quality between teammates; the factors that influence perceived success; demographic differences in

relationship quality; difference in importance of relationship versus the existence of relationship in virtual work environments; and the wide variation in the work environments of virtual workers. The electronic version of this dissertation is at OhioLink ETD Center, http://www.ohiolink.edu/etd

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Chapter I: Introduction

The world of virtual work is a relatively new phenomenon that has rapidly been employed in the business community and influenced the work patterns of teams (C. B. Gibson & Cohen, 2003). Virtual workers are those who are not physically in close proximity with all of their coworkers. Typically, virtual workers leverage technology to facilitate communications. The ability to work virtually has opened up a greater potential for global cultural diversity within teams. Dyer and Dyer (2007) attributed the rapid increase of virtual teams to the increased number of companies with offices in multiple countries, advances in technology, and the acknowledgement that the complexity of business problems requires assistance from individuals who have a wide variety of expertise who are distributed in their work environments. Kahai, Fjermestad, Zhang, and Avolio (2007) noted that research on critical factors in virtual teams has been fairly limited and that "we are just beginning to understand leadership in virtual teams" (p. i). Nevertheless, leaders in organizations need to manage increasingly complex forms of virtual teams. Zaccaro, Ardison, and Orvis (2004) acknowledged that "team members can span the world, as global networks" (p. 267). The advent of a new way of working and the need to understand relationship dynamics between team members in a virtual world is what makes the study of virtual work environments very compelling.

Growth of Virtual Work

The Global Workplace Analytics and the Telework Research Network (2013) utilizes a variety of sources to track statistics on the number of workers who are working virtually. There exist differences in the numbers due to the source of the data and the definition that is used to define an individual who is working virtually. During 2005-2012, telecommuting increased by 79.7%, not including those who are classified as self-employed. This enormous increase in the

number of teleworkers spans many different industries, with the largest growth existing in the federal employee population (421.0%) followed by state government (122.1%), non-profit (87.6%), for profit (70.4%), and local government (62.3%) (Global Workplace Analytics and the Telework Research Network, 2013). An example of the increase in the number of virtual workers nationally over the last decade is Aetna, a U.S. healthcare company. Only 9% of Aetna's workforce worked from home ten years ago. Today, approximately 47% of their 35,000 employees telecommute in some manner (Wessel, 2012). Bank of America's formal flexible work program increased from 2000 participants in 2007 to 30,000 in 2012 and is featured on the career website as an option for employees (Bank of America, 2013). Some organizations such as Yahoo and Best Buy have recently chosen to end their work-from-home programs (Pepitone, 2013). The dominant rationale cited was the need to increase creativity through in-person interaction. Yet a number of technical executives have questioned Yahoo's decision to end their work-from-home program because of the advances in technology that continue to improve the virtual work environment. Some governments are encouraging citizens to telework as a means of attaining work-life balance and addressing environmental issues associated with commuting. (Reynolds & Neild, 2013). In spite of the small number of organizations that are rethinking virtual work programs, the overarching benefits to organizations (e.g., engaging talent wherever it may be located and real estate cost savings), environmental (e.g., carbon emissions), and workers (e.g., reduced commute times and work-life balance) have made virtual work a mainstay.

Another dynamic within the virtual world of work is the development of organizations that provide office space for flexible workers. Some virtual workers prefer to have access to office space and meeting facilities. In addition, some virtual workers have experienced a sense

of loneliness or an inability to concentrate while working from home (Williams, 2013). A modern phenomenon called co-working has arisen as the teleworking environment continues to evolve. It is related to the need for telecommuters to be around others. Co-working provides a space in which to gather socially while still working independently (DeBare, 2008). Bank of America has developed a network of centers in highly concentrated areas to provide such support for its employees. Private organizations such as Corporate Suites and Green Desk offer a variety of rental options for office and meeting room space. Organizations continue to research and provide resources to improve virtual work environments. Both the environment and workers who are working virtually are very diverse and have a wide variety of needs to support their productivity and satisfaction. As a result, the "phrase one-size-fits-all" may not be applied. With the exponential increase in those working virtually, there continues to be a need to peel back the onion to understand how to support and sustain the virtual worker.

It was the enormous shift toward virtual work environments and the resulting changes in organization dynamics that fostered my desire to understand this new way of working in terms of how those working in virtual environments may achieve both organizational and personal success and satisfaction. This research study investigated the importance of relationship, through the lens of Relational Cultural Theory (RCT), to further illuminate guiding principles to be used by those who are working virtually and provide a greater understanding of how the quality of virtual relationships is related to the success of organizational teams as well as fulfillment of the individual. The most critical literature for this study falls into two categories: (1) virtual work environments and (2) RCT. The first category discussed is that of virtual work environments.

Virtual Work Environments

The term "virtual" has been used in the world of distributed work over the last two decades. Zaccaro and Bader (2003) commented on the sometimes alternative connotation of "virtual," explaining how distributed teams fit into the world of work, as follows:

> The term "virtual" is misleading because it suggests a degree of unreality, as if such teams exist only in the nether world of electrons. These are real teams having all of the characteristics, demands, and challenges of more traditional organizational teams. The differences reside in two key features. First, members of these new forms of organizational teams either work in geographically separated work places, or they may work in the same space but at different times. Still other teams have members working in different space and time zones, as is the case with many multi-national teams. The second feature is that most, if not all, of the interactions among team members occur through electronic communication channels. Thus, just as we now have e-leaders, we can label this organizational entity "e-teams." (p. 337)

C. B. Gibson and Cohen (2003) listed the characteristics or attributes required to be considered a virtual team. To be labeled virtual to some degree, a team must have the following attributes:

> It is a functioning team—a collection of individuals who are interdependent in their tasks, share responsibility for outcomes, see themselves and are viewed by others as an intact social unit embedded in one or more social systems, and collectively manage their relationships across organizational boundaries (Hackman, 1987, Alderfer, 1977). The members of the team are geographically dispersed. The team relies on technology-mediated communications rather than face-to-face interaction to accomplish their tasks. (p. 4)

They went on to identify the advantages of virtual teams as significant levels of innovation and synergy; increased effort and performance gains; and the ability to engage in constructive conflict, noting the following disadvantages of virtual teams: (1) technology failures, (2) communications challenges; (3) dysfunctional conflict; (4) inefficient work processes; and (5) challenges to support systems.

Definitions of virtual teams. To clarify what is meant by virtual teams in this study it is important to provide a working definition. Numerous definitions have been put forth. Powell,

Piccoli, and Ives (2004) defined virtual teams "as groups of geographically, organizationally and/or time dispersed workers brought together by information and telecommunication technologies to accomplish one or more organizational tasks" (p. 7). Some researchers such as Ale Ebrahim, Ahmed, and Taha (2009) included an aspect of temporariness of virtual teams. In fact, much of the research regarding virtual teams assumed that the nature of virtual teams was transient as opposed to permanent. As the temporary nature of virtual teams was the norm for many years, this prominent viewpoint in the research is more than likely due to the same phenomenon described by Taleb (2010) as the "black swan effect" in that people tend to hold assumptions based on what they know or have experienced previously that veil their understanding of present reality. Heretofore most virtual teams have been temporary; however, with the advent of new tools and technologies, the possibility of effectively working across geographic boundaries has come to fruition.

The following definition was developed for use in this study: a virtual team is a group of individuals who are in different locations and who work together through technology-facilitated communication to achieve common goals. This definition incorporated many of the descriptions of virtual teams, including geographic dispersion and use of technology tools. Although other definitions have included the importance of the team aspect of working together (C. B. Gibson & Cohen, 2003; Powell et al., 2004), this definition emphasizes the focus of the team on common goals as opposed to individual tasks. One other key difference in the definition used in this study is the elimination of the temporal aspects of virtual teams. Appendix A provides a table of terms related to virtual work environments that were developed in the course of the literature review to provide clarity during the research.

The increase in working virtually has prompted an attendant need to understand the world of virtual work. Research in the area of virtual work has thus increased exponentially as more organizations are employing those who by choice or by necessity work virtually. In today's world of work, working virtually is not about working from home. It is about working with others with whom you are not face-to-face. Today's workers function in a wide variety of ways, including place of work and how they interact with their teammates. In fact, the virtual work world is an entirely new way of working. It is not just one way of working.

The virtual continuum. The evolution of technology in the 21st century has led to a greater understanding of the benefits of expanding across geographical boundaries. Zigurs (2003) astutely stated that

> virtual teams come in many flavors and "virtuality" as a characteristic can be defined on many dimensions. Rather than thinking of a team as either virtual or not, it makes sense to think of a team as existing on a continuum of virtuality. The more dimensions or aspects on which the team is dispersed, the more virtual it is. (p. 339)

Zigurs coined the term "virtual continuum" as a measurement of the level of dispersion of a team. The following figure represents my own interpretation of Zigurs' concept of the virtual continuum:

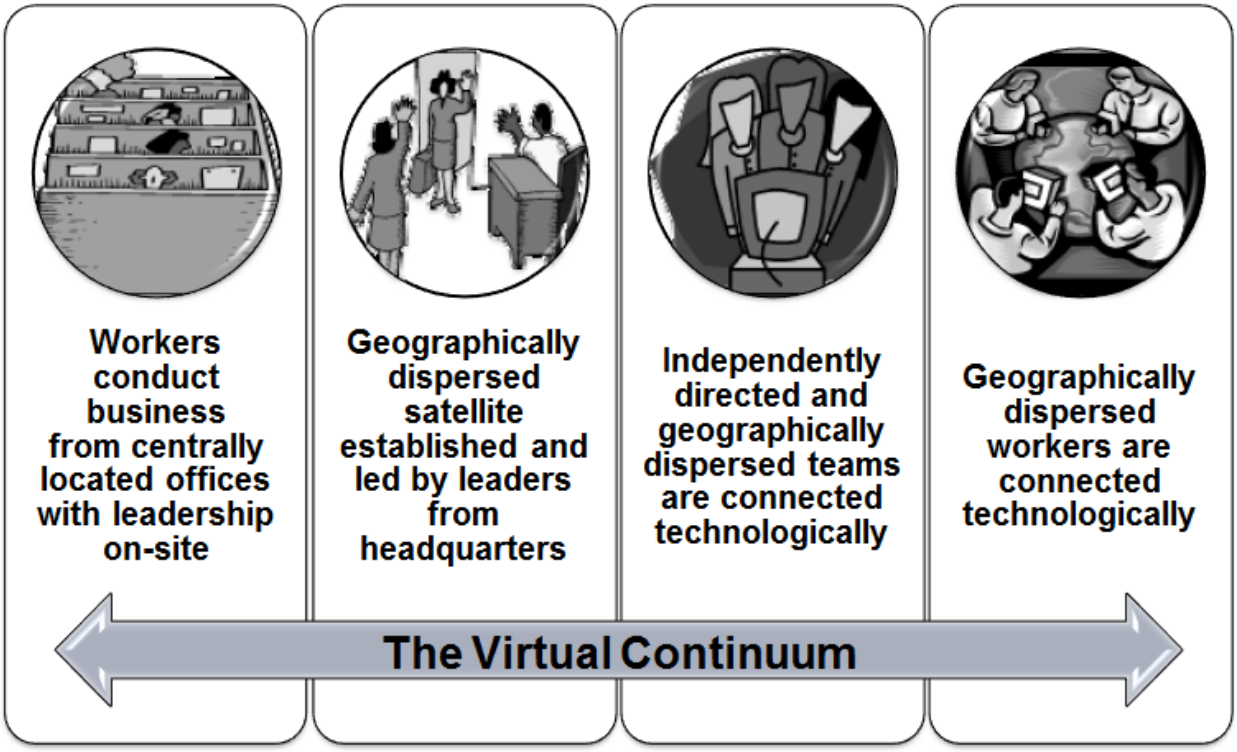


Figure 1.1. The virtual continuum description of primary work location. Clip Art used with permission from Microsoft.

The concept of a virtual continuum is the foundation for measuring the degree of virtuality in the workplace. It depicts one aspect of working virtually—geographic dispersion. It should be noted that there are significantly more than just the four separate work environments described in Figure 1.1. In reality there is a wide variety of permutations and combinations of primary work locations. Many virtual teams are mixed with some teammates working remotely and some working with teammates face-to-face at headquarters. It could be called a virtual smorgasbord. Each of the different geographic aspects of working virtually presents its own kind of challenges. This study included detailed research about the geographic aspects of virtuality in order to include this factor in the analysis of virtual teams.

While virtuality has been discussed as a concept, the specific measurement of these characteristics of a work environment is limited. This study endeavored to identify the

differences and provide quantitative data indicating how today's workforce is distributed and to facilitate assessment of the degree of virtuality of those in the workforce. The world of virtual work is evolving rapidly and research has followed suit.

Face-to-face interaction. The effect of face-to-face time has been the subject of many studies. For example, Kirkman, Rosen, C. B. Gibson, Tesluk, and McPherson (2002) studied "whether or not team empowerment is related to virtual team performance" (p. 175) and examined "the possible moderating effect of the extent of FTF (face-to-face) interaction on the team empowerment-team performance relationship" (p. 175). The Kirkman et al. (2002) research was based on the assumption that a higher quality relationship occurred simply due to the level of face-to-face interaction. This study recognized and confirmed the importance of team empowerment on virtual team performance, yet was limited in that it did not measure the differences in level of connection between the individuals. Fredrickson and Losada (2005) contended that "over time, and in both private and social contexts, people experience a range of pleasant and unpleasant emotions and moods, and they express a variety of positive and negative evaluative sentiments or attitudes" (p. 679) and that the affective texture of a person's life—or of a given relationship or group—can be represented by its "positivity ratio" (p. 679), They believe they have developed "a set of general mathematical principles may describe the relations between positive affect and human flourishing" (p. 678). This research was performed while in face-to-face environments. It would be interesting to analyze virtual interaction using the "positivity ratio."

Virtual distance. The concept of Virtual Distance introduced by Reilly and Lojeski (2009) identified a relationship between physical, operational, and affinity distance upon success. Employers who utilize the assessment are provided with a quantitative evaluation of their

organization. The Virtual Distance Index (VDI) equation indicates that "$P_{Success} = W_3Physical + W_2Operational + W_1Affinity$" (p. 51). Reilly and Lojeski (2009) explained that this equation illustrates how,

> Physical distance involves differences in space, time, and environment. Operational distance includes the psychological gaps that arise from day-to-day problems in the workplace. Affinity distance embodies the emotional disconnects among virtual team members who have no relationship with one another. (p. 3)

Reilly and Lojeski's (2009) "research indicates that the most important source of virtual distance is the lack of personal and social relationships among coworkers" (p. 3). They call this "affinity distance" and characterize this factor as "a product of shared culture, social distance within organizations, relationships, and interdependence" (p. 3). Although the Virtual Distance writings identify the importance of relationship, most of the emphasis on reducing Virtual Distance is in the physical and operational areas. Lojeski and Reilly (2008) have provided a quantifiable measure of various aspects of distance between coworkers. A quantifiable tool facilitates the identification of gaps within the measurement and permits the comparison of results across a variety of demographics, enabling researchers to benchmark results. Lojeski concentrated suggestions for improvement in the physical and operation space due to the fact that they are more tactical in nature. Affinity distance is thus created as a result of improvement in the other two dimensions. Virtual distance's affinity distance addresses the interpersonal aspects of Virtual Distance surrounding the building and maintaining of trust and connections rather than geographic dispersion as defined in Zigurs' (2003) virtual continuum.

Trust and connections. Trust is an important element of human relations and has therefore been a research focus in sociology and psychology. Kosfeld, Heinrichs, Zak, Fischbacher, and Fehr (2005) indicated that the disposition to trust and assess how trustworthy an individual is may be evident in the activity of the human brain. Trust may also be attributed

to relationships between social groups and is a means to frame intergroup dynamics and interactions (Hardin, 2004). The measurement of trust in virtual teams was tackled by Zolin, Hinds, Fruchter, and Levitt in 2004. They used Rotter's (1971) propensity to trust scale in a longitudinal study of trust in cross-functional, geographically distributed work. They found that perceived trustworthiness is particularly important in virtual work environments and that the initial rate of perceived trustworthiness does not vary across time.

The Reina Trust Institute has developed some scientifically validated tools to measure trust. The institute was founded by Dr. Michelle Reina and Dr. Dennis Reina (2007), who focus "on the field of Positive Organizational Practice which centers on optimal leadership and management practices that create the best of human working conditions in working environments" (p. 36). They emphasize the importance of relationship in business and also the criticality of trust.

As Hardin (2004) suggested, the relationships between members of a social group is influenced by trust, which suggests that the strength of these relationships speaks to the connectivity in the group. Evidence of these connections in a team of workers or interpersonal linkages between individuals has led to richer descriptions of the nature of interpersonal connection (Dutton & Heaphy, 2003; Jehn, 1994). For example, Dutton and Heaphy (2003) explained the "quality of the connection in terms of whether the connective tissue between individuals is life-giving or life-depleting" (p. 263), using the circulatory system as a metaphor to describe high-quality and low-quality connections.

> A healthy blood vessel that connects parts of our body, a high-quality connection between two people allows the transfer of vital nutrients; it is flexible, strong, and resilient. In a low-quality connection, a tie exists (people communicate, they interact, and they may even be involved in interdependent work), but the connective tissue is damaged (p. 263). The positive impact of interdependency, mutuality, and sharing was identified by Carmeli, Brueller, and Dutton (2009), who noted that, the capacities enabled by high-

> quality interpersonal relationships allow members to exchange more variable information and ideas which are critic al to creating and sharing solutions to problems and new ways to improve work processes and outcomes. At the same time, participants in high-quality relationships feel valued and connected in ways that allow them to overcome the uncertainty that accompanies working through problems and experimenting with solutions. Thus, both the capacities and subjective experiences of being in high-quality relationships can contribute to better organizational functioning. (p. 83)

Researchers in the area of relationships have generally acknowledged that team connections are important (Baker-Miller, Jordan, Kaplan, Stiver, & Surrey, 1991; Comstock et al., 2008). When it comes to measuring these aspects of relationship, however, some challenges exist. In measuring the connections, quality of relationship and trust is still a challenging construct to capture psychometrically. Some tools have been developed, including Jehn's (1994, 1995) relationship conflict scale used by Hinds and Mortensen (2005) to develop their own assessment of the impact of conflict within distributed teams. In both studies a shared identity was suggested as a mediating factor in managing conflict within distributed teams. Although tools to assist in the assessment of trust and connections have been developed, there remains substantial room for more understanding to support this topic of research.

Trust is related to connection and connection is related to relationship. That very basic linkage between interpersonal relationships is important. Research on trust, connection, and relationship in work teams describes the linkage between these three constructs and their significance in the creation of functional teamwork. Scholars of RCT have produced rich descriptions of these qualities in relationships. Their work has greatly enriched understanding of the quality of positive relationships and their measurement. An overview of RCT will provide further understanding of the basic tenets of relationship quality.

Relational Cultural Theory (RCT) Overview

In this study I utilized RCT to explore relationships in virtual work environments. RCT creates a framework to understand the importance of relationship and the resulting outcome. The origins of RCT can be traced to Jean Baker Miller's *Toward a New Psychology of Women* (1986), which promoted the importance of relationship quality. Perhaps the most foundational piece of RCT literature is Jordan, Hartling, and Walker's *The Complexity of Connection: Writings from the Stone Center's Jean Baker Miller Training Institute* (2004), which provides an introduction to the evolution of RCT and the key tenets of the theory. This early model was primarily focused on women, emerging from the scholarship inspired by the women's movement, but has evolved and expanded much beyond that focus to include relationships between all individuals regardless of gender. Jordan et al. (2004) characterized this evolution as one that "has been a movement from a psychology of separation to one of connection, and it represents a profound change in our approach to understanding people" (p. 1). Jordan et al. (2004) went on to state that

> Putting connection at the center challenges core beliefs of Western social, psychological, and economic systems. Connection is not a simple, cozy, or easy concept; viewed as the primary organizer and source of motivation in people's lives, it is powerful, complex and revolutionary, challenging some of the basic tenants and values of 21st-century Western culture. (p. 2)

The recent realization that high-quality connections are what truly motivate individuals constitutes a significant paradigm shift. Whereas the initial use of RCT was mainly in the therapy or counseling space (Jordan, 2010; Walker & Rosen, 2004) as it expanded, the application of RCT has been used in the analysis of teams who work in the same physical environment (Fletcher, 1999; Holmes & Schnurr, 2006) and branched out to education (Holloway & Alexandre, 2012; Schwartz & Holloway, 2012).

The complexity of connection and how it deviates from the Western culture of today has been acknowledged (Jordan et al., 2004). The movement toward virtual work environments may be perceived by some as a distancing tactic that may result in less of a need for connection; however, the desire for connection is a primary element of being human and as the challenges of physical distance are presented, we must endeavor to build and maintain connections.

RCT in work environments. Fletcher (1999) entered into the traditional work environment space through her participation in a ground-breaking work that served to introduce RCT concepts in an in-person work organization. The study analyzed the need to develop "a new kind of worker, one who is a continuous learner as well as a continuous teacher, who is willing to enable and empower others, to take responsibility for problems and work collaboratively with others to solve them" (Fletcher, 1999, p. 2). In summarizing her findings, Fletcher noted,

> If organizations want to develop relational practitioners, their reward systems, structures, work practices, and norms must change. These systems will need to reflect a new reality, a new set of skills, and new ways of treating others that are an integration of traits and practices commonly associated with masculine domains (technical competence, autonomous action, competitiveness, and linear thinking) and those associated with feminine domains (empathy, enabling, collaboration, and trust). (p. 114)

Fletcher has been a pioneer in applying RCT to work environments. Despite the fact that her work has been primarily limited to those who work face-to-face, it has nevertheless provided a foundational insight into the issue of relationship in the world of work.

Five good things. In general, authors whose work employs RCT refer explicitly to the outcomes resulting from the "five good things" in relationship as outlined by Miller (1986). The positive impact of growth-fostering relationships is characterized by Miller as an effect that leads each person involved to feel

> a greater sense of zest (vitality, energy); each person feels more able to act and does act in the world; each person has a more accurate picture of her/himself and the other person(s); each person feels a greater sense of worth; and each person feels more connected to other persons and exhibits a greater motivation to connect with other people beyond those in one's primary relationships. (p. 3)

I have endeavored to capture the elements of RCT that are foundational to the theory in Figure 1.2 below.

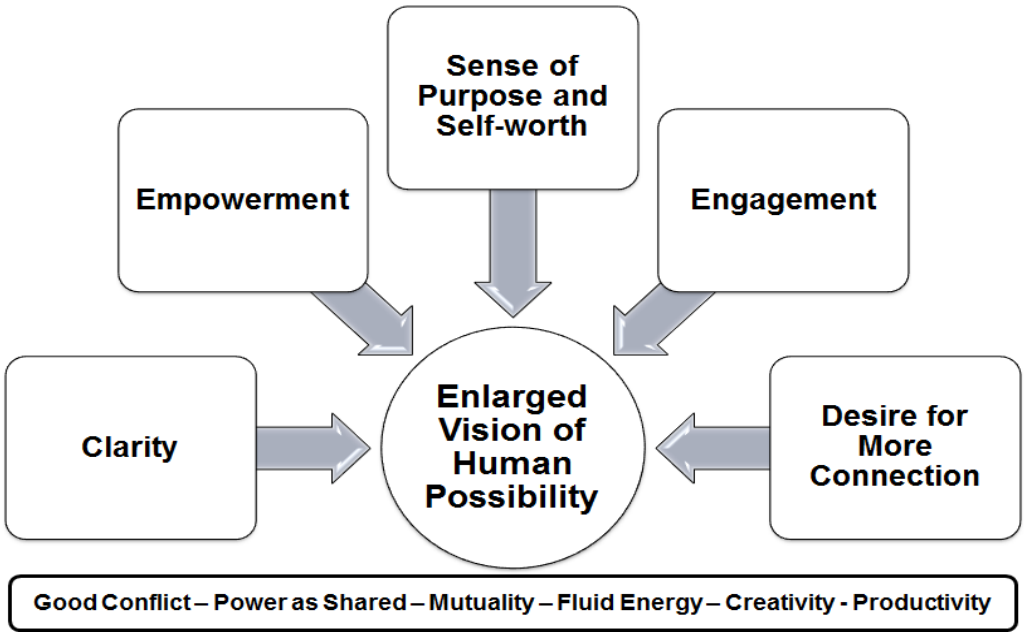


Figure 1.2. Five good things and resulting outcomes.

Figure 1.2 depicts the five good things converging to create an enlarged vision of human possibility. The possibility of experiencing good conflict and mutuality leads toward fluid energy and creativity, which all lead toward increased and improved productivity. The Relational Health Indices (RHI) provided the first and only tool to date that allows researchers to quantitatively measure relationship quality as defined within RCT.

RHI Overview. The foundational scale called the RHI measures relationship quality between friends, mentors, and the community by focusing on three components of relationship: empowerment, engagement, and authenticity (Liang et al., 2002). It is a tool that provides a

means for measuring relationship quality through the use of a quantitative instrument consisting of self-reported Likert scale items. Since the first introduction of the RHI, 18 studies have been published that used all or part of the indices (Belford, Kaehler, & Birrell, 2012; Foynes & Freyd, 2013; Frey, Beesley, & Liang, 2009; Frey, Beesley & Miller, 2006; Frey, Beesley, & Newman, 2005; Frey, Tobin, & Beesley, 2004; D. M. Gibson & Jefferson, 2006; Grossman & Liang, 2008; Heiney et al., 2011; LaBrie et al., 2008; Liang, Tracy, Kenny, & Brogan, 2008; Liang, Tracy, Kenny, Brogan, & Gatha, 2010; Liang et al., 2002; Liang & West, 2011; Munson & McMillen, 2008, 2009; Patterson, Wang, & Slaney, 2012; Slattery & Goodman, 2009). A new RHI for Youth was developed in 2010 (Liang et al., 2010) with a scale developed to address the target audience with a variation of the questions using terminology specific to youth; for example, "utilizing a simpler vocabulary and containing fewer items" (p.255). Out of the 15 studies published using the original RHI, 11 used all three relationship dynamics of mentor, peer, and community. Two out of the three studies employing the RHI-Youth also used all three relationship dynamics. One of the researchers who utilized the RHI, Dr. Melissa Frey (personal communication, October 15, 2013), indicated that the RHI is the only tool available that measures relationship quality.

RHI application in virtual work environments. As we have seen, major themes have evolved from research on virtual team environments, including the importance of members and leadership within virtual teams. Although prior research has emphasized the importance of interpersonal relationships, individuals, and trust when working virtually; the existing literature has produced limited concrete actionable outcomes.

Whereas Lojeski and Reilly (2008) acknowledged how difficult relationship is to understand and address directly, especially in a virtual world, it is nevertheless possible to design

studies capable of capturing this information. RCT has been the foundation of meaningful research on relationships in our physical world in the contexts of therapeutic healing, individual counseling, educational environments, and in-person work environments. The application of RCT tools and theory may thus contribute to an improved understanding of the connections between relationships and team success in virtual work environments. Kirkman et al. (2002) also conducted research to understand trust and connections. The results of their research on virtual work environments included an identification of the importance of people and developing trust. Relationship, trust, connections—there continues to be a need to understand how that applies in the world of virtual work.

RCT and the RHI offered significant promise for research designed to explore and understand the impact of relationship on successful outcomes. After identifying the need to understand more about relationships in virtual work environments and reviewing the available measurement tools, the idea of developing a new scale based on the RHI was born. An important challenge for this study was identifying the means to effectively measure connections between individuals and relationship quality. The introduction of RCT as a lens as well as additional research in the area of face-to-face interaction may help to overcome this challenge and by deepening understanding of the connections between virtual teammates. Assessment instruments developed from the RHI constructs provide a method for quantitatively studying the impact of relationship in the world of virtual work. Connection, zest, clarity, empowerment, and an enhanced feeling of self-worth are foundational to the newer models. The application of RCT utilizing the RHI to explore team connections and to gain insight into the people aspects of virtual teams is in plain view.

Increasing our knowledge of the specific factors contributing to virtual workplaces served as a foundation for my research seeking to develop tools and techniques to aid leaders and teammates in a virtual environment with building and providing ongoing support for distributed teams. Communications between virtual workers is paramount to success. One major determinant of the success of communications is the receptiveness of the audience. In turn, receptiveness is directly related to the relationships among individuals. Using RCT will enable this research to provide insight into existing levels of relationship, identify what aspects of relationship are most important, and offer suggestions for improvement. In addition, further research designed to better comprehend existing degrees of virtuality will likewise contribute to the understanding of virtual work environments. The application of the RHI will provide a foundation for understanding the dynamics of working in a virtual environment and determine if the intersection of virtual team environments and relationships is significant. Based on select examples of the positive impact of research oriented toward improving the virtual environment (C. B. Gibson & Cohen, 2003), my research approach incorporating application of RHI to measure qualities of relationship in virtuality presents exciting prospects for the future of virtual work environments.

Guiding Research Question and Hypotheses

Due to the expansion of the world of virtual work, developing a greater understanding of how to work effectively with those who are not face-to-face is critical to the success of those working virtually. To effectively illuminate the human factors of virtual work environments and provide visibility and guidance to those working with colleagues who are not face-to-face, this research built upon the concepts and measures of RCT to understand existing relationships and the perceived importance of relationship through an examination of the question, “What is the

nature and influence of relationship on success in a virtual work environment?" A critical part of this study was to measure perceived success in virtual work environments that will include team goal achievement, job satisfaction, and overall relationship satisfaction. By measuring perceived success, this study analyzed whether there exists a correlation between relationship and success in a virtual work environment. Included in this research study was a variety of narrative commentary providing best practices and suggestions for those working virtually.

The overarching research questions included:

- Research Question 1: What is the profile of a virtual worker in terms of demographics, virtuality, relationship, and perceived success?
- Research Question 2: How important is it to virtual workers to experience high-quality relationships in a virtual work environment and how does it align to their perception of relationship?
- Research Question 3: What is the correlation between perception of relationship quality and relationship as measured by the Relational Health Indices and the Connectivity component?
- Research Question 4: What factors influence success in a virtual work environment?
- Research Question 5: What suggestions do virtual workers have for building and maintaining high-quality relationships or to improve productivity?

This study explored these research questions in depth with the goal that the results would yield best practices for establishing and maintaining relationships among virtual team members.

Significance of the Study

By exploring the importance of relationship within virtual work environments and how relationship is maintained by team leaders and team members across geographical bounds, this

study provides valuable insights and recommendations for those working in virtual work environments, shedding further light on the impact of relationship on perceived success across the virtual continuum and providing guidance for those working in virtual environments on how to improve connections. As mentioned, research utilizing RCT has thus far primarily focused in the area of therapy and education. This research served to highlight the importance of RCT, providing visibility and applicability to the business world.

Positionality of the Researcher

The dynamic forces influencing contemporary global and transient society have permanently altered the nature of the work and home place. My parents were the first in their family to venture out beyond the safety of their traditional family roots as my father's job required that they relocate first to Ohio and then to Indiana, where I was born. The family traveled to Pennsylvania, Kentucky, and Connecticut before settling in North Carolina. We took our German/Irish heritage across the East Coast, crossing back and forth over the Mason-Dixon Line separating the north from the south in the United States. In my journey, I have found camaraderie with peers from different parts of the globe. On a very small scale I was blessed to have had so many diverse experiences. Initially, this transience was difficult as I truly was an "other" and it took a while to become a trusted friend. I had to earn that trust.

It is my belief that my childhood experience can be seen as a representative microcosm of what is happening in the world today with respect to mobility. People are being uprooted from their homeland for many reasons (i.e., political, financial, safety, or to be closer to loved ones who have already migrated elsewhere). We have so much to learn from each other in this process of ongoing transition and change. The key to the future is not about working virtually,

but rather about building a culture of connections to transcend and honor our similarities and differences.

I have a strong interest in the success and viability of those who work in a virtual environment. From December 2007 until October 2010 I was one of the senior leaders of the team that developed and coordinated Bank of America's flexible work program, as the Senior Operations Project Manager of the Operational Excellence Team. My team developed and managed the technology that supports flexible work, metrics and reporting, and a network of flexible work centers.

Overview of the Dissertation

This dissertation consists of five chapters. The purpose of this chapter was to provide an overview of the importance of this research, the foundational context from which this researcher began this journey, the question(s) addressed by this research, and an overview of the resulting dissertation. Following this introductory chapter is a review of the literature to provide an overview of research and additional literature regarding virtual work environments, a summary of RCT, and analysis of the intersections between these two important bodies of work. In addition, Chapter II builds the argument for and justification of the study. Chapter III provides an overview of the methodology with more details about the guiding research questions, including the research design and rationale for selected methodology, an overview of the research process, a description of the research tools, an analysis of targeted participants, and a review of ethical considerations. Chapter IV provides the key research findings as a result of the study. Finally, Chapter V presents a summary and evaluation of the results of the study along with a discussion of the theoretical and practical consequences of the findings, limitations of this study, and areas for future research. In addition, a summary of the application of this research to

the study of virtual work environments and the area of RCT is presented and tied back to the field of leadership and change.

Chapter II: Review of Literature

The literature review includes information on the two major components of this study, virtual work environments and relationship. A comprehensive review of the research literature in both the areas of virtual teams and RCT has informed the development and design of this research study. It is of primary importance that a thorough review of literature be accomplished as part of this study to ensure that existing knowledge was incorporated with both design and analysis.

My initial review of scholarly literature on the subject of virtual work environment was captured in a matrix that summarized the various themes surrounding virtual work (see Appendix B). The review of virtual work environments involved primarily information published in the 21st century due to the recent advancements of tools supporting virtual workers. Once I had completed my initial review of the identified literature, I initiated an engagement with the plethora of technology-enabled virtual communities to increase visibility and add to the knowledge obtained through the literature. The second main body of research, consisting of RCT and such concepts as high-quality relationships and positive organizational scholarship, emerged in the later part of the 20th century. Since that period, the volume of relationship literature has remained fairly consistent.

Virtual Work Environment: Literature Synopsis and Review

An understanding of the primary foci within the research literature on virtual teams is a useful way of organizing the current thinking in the area of virtual work environments. Prior to reviewing the literature in depth, a general comment regarding methodology is required. A review of the research conducted in virtual work environments, identified three areas of concern:

- Lack of "real life" virtual workers as participants

- Lack of detail regarding the methodology used in the study
- Lack of a tool to effectively measure connections and/or relationships among virtual team members

Unfortunately, a relatively high percentage of research studies on virtual workers have used artificially constructed teams who take on hypothetical tasks. For example, almost 20% of the research studies initially analyzed as part of this review employed artificially constructed teams and most of the studies involved graduate students. This result corroborated Powell et al.'s (2004) review of virtual team research that found 33% of studies used students as participants. These researchers concluded that artificially creating a virtual work environment to study leadership and team dynamics produces less than credible results, concluding that only by studying actual teams and/or actual participants of virtual teams will the literature contribute to a more credible knowledge base in this field of inquiry. In addition to the sampling issue, many of the research articles reviewed as part of this study failed to provide the reader with sufficient details regarding the method engaged in the study. This limits the transferability and corroboration of findings in following studies. Finally, one of the most limiting factors in virtual team research is the lack of a standardized measure of relational qualities in virtual teams.

Although the body of knowledge has increased over the last decade, the majority of the studies referenced the need for further research and investigation. As time has gone on, more robust and methodologically sound studies have been performed. Perhaps this is a function of the growing maturity of the virtual work environment. This is stated not to minimize the impact of some of the research but to offer that further analysis in this area is certainly warranted.

Team structure and processes. In general, research on work teams has confirmed that team structure and defined processes provide stability for workers (Oakley, 1999). For teams,

virtual or not, it is imperative to establish common goals and common tactics for achieving goals. Tools and processes are important for all groups who endeavor to achieve common goals. Each team member must understand his or her contribution to the overall objectives. Marginalization may take place if all team members do not understand or appreciate the contribution of each team member. Tactics and goals may change frequently as the environment changes. Frequent communication is required to ensure all are aligned to the most current tactics and goals. Without these in place, misunderstanding can occur and blame for not achieving goals may swiftly follow.

The importance of effective communications and defined processes in a virtual environment is manifold due to the lack of "water cooler" and "in-person huddles" that are often used in face-to-face teams (C. B. Gibson & Cohen, 2003; Kerber & Buono, 2004). Lurey and Raisinghani (2001) suggested that "virtual teams are first and foremost teams. As such, they must have a shared purpose to foster the need for members to work together. If these joint goals are present, then team members must rely on each other to perform their work" (p. 532). Sivunen's (2006) research also stressed the importance of establishing and constantly reinforcing common goals as well as the creating structure within a team as key factors in the success of virtual teams. Boehnke, Bontis, DiStefano, and DiStefano (2003) found "that a clearly focused, committed organization with strong visible leadership can accomplish what might otherwise be seen as impossible" (p. 14). Latapie and Tran (2007) found that "more than traditional centralized organization, a virtual organization requires an active presence of organizational leadership" (p. 193). Together with organizational leadership, there is a need for clear and effective communications. Distance further complicates communications success in virtual environments.

Structure and process also impact team dynamics. These factors are important in all working relationships; however, recent research within virtual work environments highlights this as an area in which to focus. The importance of structure and team dynamics were explored by Ryan (2010), who stated that "In order to be considered a team—and not merely a group—there must be a degree of interdependence. Without interdependence, it is simply a workgroup with output as the collective sum of the individual efforts" (p. 17). Ryan further elaborated by acknowledging that "Experience tells us that there is more to leadership than simply formal authority" (p. 31) and noting how "in a virtual team, greater performance often results when leaders encourage recognition and reward members" (p. 32). Ryan identified the importance of interdependence and how important it is for a team to be reliant on others to effectively achieve their goals. This concept has been referred to as synergism. Organizations search constantly for ways to improve productivity, primarily through the use of process improvement techniques to streamline processes and eliminate hand-offs. Too much streamlining may result in not involving all processes or people who should be included. Without interdependence, teams become isolated, yet, if organizational skills are not applied to interdependence, chaos ensues.

Oertig and Buergi (2006) found it is important in virtual teams to manage tasks by defining "team operating guidelines" (p. 26), which implies that the basic premise of a team's operations is to identify common goals. In global virtual teams, all members will not share the same perceptions. Zakaria, Amelinckx, and Wilemon (2004) relayed that "members from different cultures will, in all probability, describe a team's objectives, membership criteria, and activities in very different terms" (p. 20). This may be especially true in a virtual team environment. Rosen, Furst, and Blackburn (2007) discovered that "to work efficiently and effectively, virtual teams must develop similar mechanisms within their teams for sharing

knowledge and building tractive memory systems" (p. 270). Flammia, Cleary, and Slattery (2010) "found that teams who divided up the project roles based on team members' individual strengths had greater satisfaction with the team experience" (p. 97). Certainly, if objectives differ, expectations may potentially be violated. Wakefield, Leidner, and Garrison (2008) found that "effective virtual team leaders assume specific roles as well as a multiplicity of roles that benefit organizational outcomes" (p. 449). Specifically, they found "when the internal roles of monitor, facilitator, mentor, and coordinator are exhibited by the team leader, team members indicate less overall conflict and attribute greater effectiveness to the team leader" (p. 450). The positive impact of sharing knowledge has been identified through numerous research studies. Positive impact includes increased buy-in, more engagement, and better results (Nevis, Lancourt, & Vasallo, 1996). Robust tools and processes alone may not truly support sharing. A constant evaluation of tools and processes and whether they add value to each specific audience is required.

The work of Gluesing et al. (2003) also highlighted the importance of establishing an initial structure, formalizing the start-up with in-person interface, and supporting integration of the teammates. They observed that "It is our experience that teams that engage in integrative processes consistently throughout the formation and ongoing development of the team will be more likely to reach maturation and perform effectively to achieve their task" (p. 379). C. B. Gibson and Cohen (2003) discussed team structure as well. In fact, structure and

> how teams are designed can determine whether they succeed. The elements of team design important in face-to-face settings may be even more important for virtual collaboration given the complexity that must be managed. New designs also may be required as a result of the virtual team's reliance on technology-mediated communication. (p. 179)

Technology tools are utilized extensively in all work environments and are the glue that connect workers together especially virtual teams.

Structure is important; however, it is not necessarily the team leader's responsibility to establish structure. In fact, dependence upon a single leader to perform the traditional leader functions is not necessarily what occurs in virtual teams. Shared leadership and emergent leadership are more likely the norm of highly engaged work groups. Lipman-Blumen and Leavitt (1999) alluded to this concept in what they term as hot groups.

> A hot group is a special state of mind. It's not a name for some new kind of team or task force or committee. The hot group state of mind is task-obsessed and full of passion. It is always coupled with a distinctive way of behaving, a style that is intense, sharply focused, and full-bore…It is not the name, but that contagious single-mindedness, that all-out dedication to doing something important, that most distinguishes a hot group from all others. (p. 3)

The virtual world is a wonderful breeding ground for hot groups because members may be engaged across geographical boundaries. Teammates may be called upon across geographical bounds and the more we learn how to effectively work virtually, the more productive and impactful all teams will become.

In virtual teams it is difficult to separate the communications tools and techniques from the theme of team structure as they are very closely tied, as noted by Oakley (1999), who sought to learn more about team dynamics and the supporting communications technologies. She found that

> developing effective leadership processes at all levels of the organization that are aligned with the more flexible nature of team-based organizational structures is critical to the successful implementation of virtual team structures. Top management's role in shaping an organizational culture that can glue together dispersed individuals and teams is crucial to creating high performance in a virtual organization. (p. 15)

Furthermore, "leaders that can create a compelling sense of purpose which drives its members and also counteracts the tendency to disengage" (Oakley, 1999, p. 15). An important thing to

remember when communicating is that each level within an organization may require a different context focus. Oakley (1999) noted that

> At the lower levels of the organization, whether or not virtual teams can be implemented in a way that meets the social needs of their members and the performance expectations of the firm may depend on the way teams are designed, the personal temperament and self-management skills of the team members, and the power orientation and degree of involvement of team leaders. (p. 15)

Such research indicates the levels at which structure is important in virtual work environments and sheds light on how technology tools may be utilized to support the structural needs of virtual workers.

Technology tools. Technology facilitates the efforts of workers in all types of work environments, especially those who work virtually. A virtual workforce requires virtual connectivity and collaboration. Lipnack and Stamps (1999) pointed to the fact that establishing connectivity between functions and teammates is important to be successful, observing that

> The easiest way to transition from hierarchy/bureaucracy to a networked organization is to add links to connect the various functions. The result is a strong but flexible geodesic structure based on connected tetrahedrons—a structure better able to resist the impact of change. Bureaucratic specialization is not going away, but the new links allow communication to flow horizontally as well as vertically, and precious time is saved. Gradually, a new form of organization will emerge. (p. 14)

In such an organization, the virtual team worked together on a daily basis even though they were a continent apart. The engineers were connected by a high-speed, full bandwidth, continuously available, audio, video, and data link that they affectionately nicknamed “the Worm Hole” (p. 17). Collaborative teamwork across continents is not just a pipedream. Not all virtual workers have access to the full breadth of technology capabilities enjoyed and employed by the engineers who use “the Work Hole,” however, the capability of high bandwidth that supports visual and audio as well as data connection is now possible. The positive impact of those technological capabilities can greatly affect the virtual experience.

Tapscott and Williams (2008) reviewed the dynamic shift that a collaborative environment has had upon virtual work. On one side, there is concern that the eroding of intellectual property rights is a significant problem. On the other, the availability of "free" information can only serve to jumpstart new thought. The Internet provides open access to information that means the playing field of knowledge acquisition is being leveled. Information is no longer "proprietary" power. Zakaria et al. (2004) relayed that "management practitioners have often undervalued the profound influence of culture on knowledge conceptualization and transfer. Knowledge sharing is often facilitated by communication that involves the exchange of meaning" (p. 17). Unfortunately research in collaboration is also peppered with the use of artificial environments and studies that utilize students as participants and short-term studies that do not emulate a real-world environment of sharing. Understandings of collaboration in the everyday world of work are thus limited.

The importance of technology is highlighted in the work of Kerber and Buono (2004), who indicated that it "facilitates the leader's ability to intensify the integrating forces that enhances the effectiveness of virtual teams. What is communicated and how it is communicated via this technology, however, remain the most critical factors" (p. 9). Al-Ani, Horspool, and Bligh (2011) observed that "while the team leader facilitated team meetings and brainstorming, the leader did not play a central role in communications, as interviewees reported that they were able to communicate on an as-needed basis, and not necessarily through the team leader" (p. 235). Access to technology has put the power of communicating in the hands of all. On the flip side, "information and communication technology usage failures can have a domino effect that erodes team productivity" (Thomas & Bostrom, 2008, p. 54). A plethora of collaborative tools have been developed to facilitate transfer of knowledge and connect virtual workers. No longer

does work need to be face-to-face to share information. As a result, transfer of information is at our fingertips—it is instantaneous. Sharing of information yields a more collaborative and less directive work environment. The role of leader may be passed between members of a team as information is shared and specific skill-sets are required to complete a task at hand. "Enterprises are transcending from 'place', or a terrestrially-grounded orientation, to a 'space', or a virtually-extended orientation, and they are bringing their control and communication systems with them" (Gordon, 2001, p. 676). Examples include messaging tools (e.g., e-mail and instant messaging); meeting facilitation tools (e.g., SKYPE, webcams, and virtual meeting software); social media: (e.g., Facebook and LinkedIn); and special interest Internet groups often linked to a social media site (e.g., Office and Transformational Leadership both on LinkedIn).

One challenge with the advancement in technology may be the lack of ability to use the new tools. As society moves toward using more advanced technology to facilitate developing work products and basic team communications functions, some team members may become marginalized due to lack of understanding of or expertise with the tools.

Communications. Not all communications require advanced technology. Traditional research articles as well as conceptual literature are prevalent on the importance of effective communications. A review of the literature and previous research that was totally focused on communications techniques especially in a learning setting was performed by Walvoord, Redden, Elliott, and Coovert (2008). Weisband (2008) also expounded upon the variety of communications techniques and technologies required to support virtual teams.

In obtaining perspectives from the field, Hambley, O'Neill, and Kline (2007) identified the importance of conducting regular one-on-one meetings as an excellent way to effect communications. Stevenson and McGrath (2004) identified the importance of "regular personal

contact" (p. 131) and found that "communication breakdowns are more likely for off-site teams" (p. 129). One of the challenges of working virtually is the lack of face-to-face interaction. Balthazard, Waldman, and Warren (2009) observed that "oral communication and non-verbal cues, fully available through face-to-face interaction (but attenuated through communication technologies) may be necessary to drive the relationship between personality and transformational leadership perceptions on the part of others" (p. 661); however, Bjorn and Ngwenyama (2009) noted to the contrary that "communication breakdowns related to a lack of shared meaning at the life world level often becomes more salient when the participants are co-located than when geographically distributed" (p. 227).

Best practices for effective communications were shared in a number of articles, including the need to "determine the best communication and decision–making practices for the team" (DeRosa, 2009, p. 11), and the fact that "communication effectiveness was also positively associated with perceived leader performance" (Neufeld, Wan, & Fang, 2010, p. 241). Horowitz, Bravington, and Silvis (2006) observed that communication was consistently rated as one of the most critical factors in the effectiveness or failure of virtual teams. Earlier in this proposal some of the challenges of virtual performance management were identified. Effective use of communications by both leaders and followers may be used to overcome some of the challenges. Golden, Barnes-Farrell, and Mascharka (2009) identified that "supervisors place more emphasis on information obtained during direct observations than on information acquired in a virtual fashion" (p. 1602). That being the case, both leaders and followers must make an effort to bridge the virtual communication gap, and, as a result, fairly and equitably measure performance.

As indicated earlier, it is difficult to separate some of the themes common in the study of virtual work. The common thread of culture is also relevant to the study of the impact of communications upon flexible workers. One of the challenges of communications identified by C. B. Gibson and Manual (2003) is that

> the exact nature of communication processes in virtual teams, that is, their antecedents and consequences, is as yet unknown' nevertheless, we can examine basic communication research as well as research examining intercultural and electronic communication, for clues to as to the nature of these processes. Communication processes are the key underlying mechanisms for establishing trust. There are several reasons that communication and information processing play important roles in trust building. Communications engenders cooperative relationships, provides insightful information about the personalities of team members, lays a basis for developing common values, and encourages continued action. (p. 69)

Communications and information sharing styles differ across cultural and organizational bounds. Bantz (1993) indicated that "when considering intercultural communication, the concern is not solely the characteristics of the members' cultures (whether it is high in individualism or whether members speak a particular language), but also the mixture of those characteristics within the group. The fundamental concern is the degree of diversity of the group" (p. 3). Lack of skill to use the communications technologies is an issue; however, other skills are being identified that are critical to working virtually. "Management practitioners have often undervalued the profound influence of culture on knowledge conceptualization and transfer. Zakaria et al. (2004) found that "knowledge sharing is often facilitated by communications that involves the exchange of meaning" (p. 17). If there is a lack of basic understanding of how things are communicated in different cultures, there will not be an effective transfer of knowledge. If an individual does not have the qualities necessary to work virtually, they may be passed over when developing a virtual team.

A research study conducted by Maznevski and Chudoba (2000) sought to understand how communications patterns within global virtual teams may be tailored toward the task at hand. They performed a longitudinal study with three separate global teams that identified the need to adjust both the content and delivery of messages based on the complexity of the task and the relationship of those to whom communications are directed. Simoff and Sudweeks (2007) uncovered specific communications patterns that identified the emergence of leaders in a virtual environment. Their studies used students as their participants, which is less than optimal. Salter, Green, Duncan, Berre, and Torti (2011) researched the relationship between personality and how leaders were ranked using Bass and Avolio's Multifactor Leadership Questionnaire. Like the Simoff and Sudweeks study, this one used university students as participants. They discovered that "regardless of whether the virtual environment is a business or educational institute, specific words or phrases to promote enthusiasm are necessary but are often absent" (Salter et al., 2011, p. 181).

Continuing with the importance of context, C. B. Gibson and Cohen (2003) identified that "information technology provides the infrastructure for virtual collaboration" (p. 235) and "context is important for technology use in at least six ways: physical infrastructure, culture and language, accessibility of information, crossing time zones, team size, and maturity of the technology" (p. 235). Kahai, Carroll, and Jestice (2007) also emphasized the importance of context in virtual communications, stating that

> virtual worlds offer a rich range of features and new possibilities for virtual team collaboration. Understanding their impacts on virtual teams is important in order to use them effectively and take full advantage of their current and future development. A carefully followed research agenda will bring greater understanding to the complex issue of virtual world collaboration compared to collaboration in other channels. Leaders of virtual teams will be better able to choose appropriate virtual world features and leadership behaviors to heighten group effectiveness with a more thorough understanding of the complex interactions among leadership, context, and team members. (pp. 66-67)

The importance of technology was acknowledged by Lipnack and Stamps (1999), as follows, "The technology is here today that allows people to work together at a distance just as though they were next door to one another in an office setting" (p. 17). Lipnack and Stamps also identified that there is more of a dependency on people than technology within successful virtual teams. Advancements in technology over recent years have provided a number of new tools to support those who work across miles rather than within an office setting with their teams. As with all tools, some are used more effectively than others. Yet effective partnering constitutes much more than simply the use of tools. With instant access and connections between team members, there is less reliance on the traditional team leader to orchestrate workflow. In this type of environment it is critical that teammates know the capabilities and skill sets of their teammates and trust that each individual will perform his/her tasks to support overall goal achievement. Effective collaboration and sharing is necessary in virtual teams and interpersonal dynamics are key (Tapscott & Williams, 2008). The introduction of interpersonal relationship and the understanding of the individual will yield more effective use of tools by revealing and lauding human differences.

Personal knowing and trust. Personal knowing and developing connections between individuals to effect trust and relationship quality has also been a common theme of the literature and research studies. Lipnack and Stamps (1999) presented a new virtual team model with three components that combined purpose, people, and the linkages between them, pointing out that "in a virtual team, purpose goes beyond a mission statement that is put on the wall and forgiven. Purpose must be translated into action steps that become the basis for the work people do together" (p. 18). They go on to include the reminder that

> People are the core of virtual teams. But there are key factors that must be considered. The first is interdependence. Everyone in the virtual team must be autonomous and self-

> reliant but still able to be interdependent. They must know how to be "me," while simultaneously holding onto being "we." (p. 18)

Lipnack and Stamps (1999) identified the second aspect of this equation as "shared leadership" and the third as "integrated levels" (p. 18), clarifying that

> Links are connections—not just technology. These connections may be through face-to-face conversation or through communication technologies. But the connections themselves are totally passive. Results require interactions of some kind. Over time, those interactions will produce relationships, and if they are trusting relationships, they will endure. Relationships make the organization. What makes the information age different is not the relationships or the interactions, it's the digital technologies. (p. 18)

This statement warrants repetition, as it is very relevant to the current research question: "relationships make the organization" (Lipnack & Stamps, 1999, p. 18). Dutton and Heaphy (2003) asserted that relationships may be either give or deplete life. Therefore, if relationships are truly primary to the organization, positive relationships sustain organizations and diminishing relationships may destroy organizations.

The concept of Virtual Distance is not a measurement of the traditional view of distance that is tied to proximity. It is a measurement of the connections between workers. "Virtual team leaders rated as effective by their members, demonstrate first and foremost a mentoring quality characterized by concern for the members, understanding, and empathy" (Kayworth & Leidner, 2001, p. 30). Virtual distance may be small or large even between teammates who sit side-by-side if they rarely communicate on a personal level. On the contrary, virtual distance may be small between geographically dispersed teammates if they connect on many levels. Lojeski and Reilly (2010) noted how different today's workforce is from even ten years ago and suggested authenticity results in "trust and commitment which are essential in leading a multicultural and multi-generational global workforce" (p. xvii).

Authenticity and transparency are important to leading virtually. The ability to develop trust across the miles is still in a phase of early development. Organizations are just beginning to explore how to connect virtual workers and transform the world of work. Ocker, Huang, Benbunan-Fich, and Hiltz (2011) noted that "an understanding of the success factors for leadership in virtual teams and sensitivity to the need to avoid estrangement of distributed members can promote successful leadership in all the possible leadership configurations" (p. 290). Lee-Kelley and Sankey (2008) found that over time "as workers become more accustomed to virtual team-working, many of the anticipated difficulties become increasingly unimportant for their performance—albeit that face-to-face interaction remains valuable for trust and relationship building" (p. 61). Additionally, micromanagement in a face-to-face or virtual setting can erode trust. As Richardson (2010) stated, "Continuing with the theme of maintaining a balance between establishing close relationships with employees but avoiding micromanagement, many managers were concerned that micromanagement runs the risk of employees feeling that they are not trusted" (p. 144). The significant importance of face-to-face interaction is a commonly identified need across the research. Bridging the span of time between in-person and virtual interaction is what Lojeski characterized as managing virtual distance. P. Peters and Heusinkveld (2010) found that managers have a significant impact upon the successful introduction of a virtual work program. Indeed "the attitudes of managers can be regarded as a starting point for these changes" (p. 127). Each individual brings to a change in his/her work environment his/her expectations and beliefs. Tietze and Musson (2010) discovered through their research the importance of understanding the whole individual and how a person's relationships and environment impact his/her identity. Significant planning is required to effectively institute a virtual work program. Harris' (2003) research findings indicate

that one must analyze each specific person's situation as well as a manager's expectations when building the foundation for a work at home situation. It is impossible to apply a cookie-cutter approach when working across the virtual divide.

Leaders often struggle with establishing a balance of providing enough freedom yet enough support of followers. L. Peters and Karren (2009) observed that "teams that initially exchanged social communications in addition to task communications were able to develop trust quickly" (p. 494). Merriman, Schmidt, and Dunlap-Hinkler (2007) found that "trust in one's manager and perceived managerial support differ across types of employment relationships. Specifically, the findings indicate lower levels of trust and support within virtual as compared to conventional relationships" (p. 6). In an environment "whereby individuals are more concerned with coming across as tolerant than with the quality of human interactions" (Essed, 1996, p. 2), a lack of trust and mutual understanding is bred. The challenges specifically related to a virtual workforce are in the area of diversity of geography and culture. As Putnam and Feldstein (2003) explain:

> Building social ties among people who already share a reservoir of cultural referents, family history, or personal experience is qualitatively different from building ties among those who do not—different in how it gets done, how often it gets done, and what happens as a result. For this reason analysts find it helpful to distinguish between "bonding social capital" (ties that link individuals or groups with much in common) and "bridging social capital" (ties that link individuals or groups across a greater social distance). Both kinds of connections are valuable to us as individuals but bridging is especially important for reconciling democracy and diversity…Bridging is not about "Kumbaya" cuddling. It is about coming together to argue as much as to share. (p. 279)

Focusing on people is an important aspect of leadership in any environment and it is especially so in the art of leading virtual teams. Jacobs (2008) found that specific "relationship-building management practices foster commitment in remote work contexts" (p. 52), especially when dealing with remote subsidiaries. Despite this, however, there has been an ebb and flow in the

advancement of virtual work protocols as the establishment of these essential ties between individuals and ties to organizations has vacillated significantly.

The work of Moustafa-Leonard (2007) identified a need to research the important topic of a manager's trust in his/her team. The author relayed numerous studies about how an employee's trust in his/her manager or organization is established and developed. The scope of the study included topics such as trust and organizational behavior research, trust in the manager-subordinate dyad, and the relationship of measurement and type of work to potential levels of trust. C. B. Gibson and Manual (2003) also acknowledged the importance of trust, asserting,

> believe that integration, shared understanding, and trust are equally important in establishing an effective foundation for virtual teaming. Integration is the structural underpinning, establishing the systems, policies, and forums that enable people across time and space to work together. Shared understanding provides the cognitive linkage, enabling people to understand where they are going and how they are going to get there. Trust provides the emotional connection, allowing people to be vulnerable with one another. Pasting together the virtual workplace means paying attention to structure, cognition, and emotion. (p. 88)

It should be noted that "if a team is high in social capital, it likely has high levels of trust" (C. B. Gibson & Manual, 2003, p. 232). A thought-provoking question is posed in their writing that "perhaps strong virtual team leadership can function as a substitute for trust" (p. 252).

Research to understand more about trust in the virtual work environment was also conducted by Tyran, Tyran, and Shepherd (2003), who

> examined the perceptions regarding these three types of trust and found that the emergent leaders in our study were more likely to be rated higher with regard to these aspects of trust. In particular, leadership ranking was most strongly correlated with role performance trust. Leadership ranking was also significantly correlated with ethical integrity trust and affective bond trust. With regard to role performance trust, it appears that the leaders in our study gained the trust of their teammates through reliability, consistency, quality of work, initiative, and experience. (p. 187)

In their study, they "found evidence to suggest that a high leader ranking was also associated with traits of inspirational and transformational leadership, including behaviors of influencing

through the use of values and ideals, inspirational motivation, intellectual stimulation, and individual consideration" (p. 187).

Other research by Eom (2009) and Jarvenpaa, Knoll, and Leidner (1998) focused specifically on trust in a global virtual team setting. The Eom study provided some recommendations for practitioners of global virtual teams, however, limited details regarding methodology or participants were provided. The Jarvenpaa et al. study included participants who were MBA students who either participated in virtual collaboration sessions or were brought together for a limited time only for the study.

Discussion surrounding transformational leadership has included the importance of trust. A research study conducted by Podsakoff, MacKenzie, Moorman, and Fetter (1990) found that "the effects of the transformational leader behaviors on citizenship behaviors are indirect, rather than direct, in that they are mediated by followers' trust in their leaders" (p. 107). It is important to understand the implications of trust being a mediating factor. Consideration of transformational leadership in virtual team was included in a dissertation thesis by Skattebo (2011). Specifically focused on the role of trust and empowerment within leadership of virtual teams; the effectiveness was measured by performance and satisfaction. Results yielded a positive correlation between trust and team effectiveness, however, trust did not mediate the relationship between transformational leadership behaviors. In addition, empowerment was not significantly related to virtual team effectiveness and transformational leadership was found to be positively related to trust, empowerment, and effectiveness.

The concept of trust as it relates to the virtual team environment was identified by Mitchell and Zigurs (2009) as they summarized the results of the analysis of 42 empirical studies to determine the thoroughness of research on trust in virtual teams. They provided detailed

tabular summaries of themes, definitions, and methodologies. Their "studies show that trust is a complex multidimensional construct" (p. 71), a point that highlights the fact that an agreed-upon definition of trust has not yet been defined. Some studies occurred only at a particular point in time, although some were longitudinal. Mitchell and Zigurs' work thus highlights future research possibilities, including longitudinal and additional trust/relationship based.

C. B. Gibson and Manual (2003) devoted an extensive chapter in their book on trust that shared information on their research of three culturally diverse teams accomplished through interviews with leaders, members, and corresponding stakeholders, noting that "Collective trust is challenged by the often prominent differences in culture and the lack of face-to-face interaction in virtual teams" (p. 59). They indicated that their

> basic argument is that the degree and type of cultural differences represented on the virtual team matter a great deal. Specifically, we propose that in ongoing virtual teams, the number of cultural differences represented on the team is negatively associated with the establishment of trust. (p. 62)

They went on to state that "Uncertainty regarding whether each other intends and will act appropriately is the source of risk. Risk creates an opportunity for trust. Only if some initial risk is taken is it possible for the trust to demonstrate his or her trustworthiness" (p. 62), elaborating further that "Distrust and suspicion often arise between individuals from different groups, such as cultures, purely on the basis of group membership" (p. 62). As C. B. Gibson and Manual (2003) pointed out, "Due to in-group and out-group distinctions, perceptions of risks in terms of information sharing across these cultural subgroups are likely to be exaggerated, particularly when members of one subgroup have inadequate information about the other subgroup" (p. 63).

Trust or the lack thereof is the single most prevalent issue of virtual teams (C. B. Gibson & Manual, 2003). One builds trust through affecting a common understanding and shared experiences (Mitchell & Zigurs, 2009). The fact that most interaction within virtual teams is

conducted without physically seeing the other individuals can cause misunderstandings. Cultural differences sometimes exacerbate those misunderstandings. Building a common understanding and shared experiences virtually thus requires a deliberate and concentrated focus. .

Cultural inclusion. The role of culture on communications, trust, and personal knowing has been a topic of research in numerous studies on virtual teams (Mitchell & Zigurs, 2009). Cultural differences make virtual trust issues challenging (Eom, 2009). The design of this study incorporated some cultural related questions to attempt to understand the role of culture within relationship. Ubell (2010) commented on the fact that a face-to-face environment "is a place where ethnicity, gender, and race is in plain sight, sadly subject to the same stereotypes and prejudices found in the streets" (p. xvii). Ubell (2010) referred to Reilly and Lojeski's (2009) work on Virtual Distance indicating that "the absence of affinity among team members is the greatest obstacle to quality performance. For them, reducing emotional estrangement in groups is the single most important task." (p. xxxvii). Ubell's observation from the education indicating that faculty must "play a new part as complex agents of intellectual transformation" (p. xxxix) and must "practice collaborative skills—giving and receiving help, sharing and explaining content and offering feedback, but also interrogation, critique, challenge, argument and conflict" (p. xl) is very applicable to managers in the corporate world.

Woven within the nuances of people and trust, cultural differences present different implications. Developing a foundation of trust may be complicated by cultural differences; however, this is not the only issue when dealing with people-related challenges. Never before have so many from different backgrounds come together to work for a common goal. In coining the terms "cultural unlearning" (Vaill, 1996, p. 151) and developing "cultural keys" (p. 157) over a decade ago Vaill offered a very insightful commentary on how society must consciously

unlearn what our dominant culture has taught for centuries. As Vaill wrote, "A cultural key is not self-knowledge, and it is not other-knowledge. It is knowledge of the self-in-relation-to-other" (p. 158). In fact, "finding a cultural key to unfamiliar situations is unlearning as a way of being" (p. 159).

In a global world, especially a global virtual world, it is critical to develop cultural competence. Javidan and Dastmalchian (2009) pointed out the importance of this for leadership, noting that "The underlying message…, and indeed from the GLOBE project, is about the necessity of developing a global outlook for leader-managers" (p. 58). Whereas leaders of course have typically been exposed to many data points or other information from which to glean cultural competency, at times the scope of the required cultural knowledge can be overwhelming. Focusing on select vital cultural factors may be a more realistic strategy for successfully navigating the global landscape. In many ways employing cultural competency virtually is no different than leading culturally diverse teams within organizations that have face-to-face environments. Cultural diversity is the norm rather than the exception in today's workplace, whether face-to-face or virtual. Javidan, Dorfman, Luque, and House (2006) observed that "the essence of global leadership is the ability to influence people who are not like the leader and come from different cultural backgrounds" (p. 85). Project GLOBE provides significant data that, upon analysis, may be used by leaders to provide basic guidelines when working across cultural differences. Lee (2002) urged leaders to remember that "how to manage a virtual team should be carefully considered based on cultural differences, especially cultural protocols with respect in Confucius tradition-influenced societies" (p. 232). This is particularly important given the research indicates that there is a linkage between "styles of decision making to cultural values of decision makers" (Albaum et al., 2010, p. 139).

Developing a common bond across cultures is a challenge, a point that Essed (2010) emphasized in stating,

> The ability to acknowledge cultural experiences without stigmatizing them is at the heart of social justice and dignity. Social justice and dignity require, among other things, an understanding of systems of privilege and oppression, which are invariably connected to notions of power and authority in organizations. (p. 139)

Understanding differences and similarities among leadership styles is required to effectively lead organizations with different cultures. Managing in a cross-cultural environment has proven to be especially challenging in the area of performance assessment. Research has indicated that "cultural values have a systematic effect on rating discrepancies between self and observers. Results show that power distance indeed influences rating discrepancies between self and observers, especially between subordinate ratings, of leadership skills" (Eckert, Ekelund, Gentry, & Dawson, 2010, p. 272). Through their cross-cultural research on virtual teams, Brodbeck et al. (2000) found that asking researchers to prototypically provide information regarding cultural differences "may be used to model relative differences between leadership concepts of different cultural origin" (p. 24). Cultural awareness may be identified as a two-edged sword, as follows:

> On the one hand, it is important for everyone to be familiar with other cultures and life-styles. On the other hand, more knowledge also means the possibility of greater control. Information about ethnic backgrounds does not in itself lead to a positive opinion about the respective groups. The danger is that each expression that smells of difference will be exaggerated, stereotyped, and added to the guidelines on how to deal with" others. (Essed, 1996, p. 44)

As a member of a performing team, one would expect that one's performance would be assessed based on one's results. The very idea that stereotypes enter into the picture is disconcerting and can potentially lead to violated expectations.

Extensive research in the area of culture was conducted by Hofstede (Hofstede, Hofstede, & Minkov, 2010) and Project GLOBE (Muczyk & Holt, 2011). Hofstede began his work in the

early 1980s analyzing cultural differences and similarities within the IBM organization. Hofstede now collaborates with his son Gert-Jan Hofstede and Michael Minkov to further his studies. In their most recent book, they reference the following quotation from the movie *Twelve Angry Men* to emphasize how deeply culture is embedded within and affects the interaction between individuals:

> 11th juror: (rising) "I beg pardon, in discussing…"
>
> 10th juror: (interrupting and mimicking) "I beg pardon. What are you so goddam polite about?"
>
> 11th juror: (looking straight at the 10th juror) "For the same reason you're not. It's the way I was brought up." (p. 141)

It has been observed that there is "considerable overlap between Hofstede's work and Project GLOBE" (Muczyk & Holt, 2011, p. 278). Project GLOBE is a global research program established to analyze leadership and organizational practices. According to the project's website (http://business.nmsu.edu/programs-centers/globe/) the idea was first established in 1991 by Robert J. House, a professor at The Wharton School at the University of Pennsylvania. The research has been in-depth and consists of a questionnaire containing 753 items used to measure the various dimensions. The tool measures two major classifications of dimensions: cultural practices and society level data for leaders. In the area of cultural practices, Project GLOBE built upon the foundation of Hofstede's five dimensions and provided a more comprehensive analysis of cultural dimensions.

In a world of global decentralized teams comprised of those from different geographies and cultures, understanding both the positive and negative impact of diversity is important. Euwema, Wendt, and van Emmerik (2007) conducted extensive quantitative research to

understand the effect of a society's culture on what they termed as Group Organizational Citizenship Behavior (GOCB) and the moderating role of culture in different types of leadership styles. As anticipated, directive leadership was negatively related and supportive leadership styles were positively related to GOCB. They also found that culture did moderate the relationship. Likewise Dool (2010) pulls in information referred to Project GLOBE and Hofstede's work on culture, emphasizing differences in level of collectivism, context, multitasking, emotional display, and focus on status versus achievement to emphasize his point of learning to work across cultures. Dool (2010) observed that "Teaming across borders refers to heterogeneous, multicultural teams located across geographic borders or multicultural teams all located within the United States" (p. 162). Graen (2006) presented a critique of the research methodology utilized by Project GLOBE and presented the Third Culture Bonding (TCB) approach to understanding of leadership across cultures to address GLOBE's limitations. Cultural inclusion requires knowledge and understanding of different perspectives and thought processes. Project GLOBE emphasized the different ways in which individuals approach tasks and activities. The differences may be subtle or overt. An appreciation of difference is needed to work effectively in culturally diverse environments.

Leaders within global teams should pay attention to the impact of leadership styles across cultures. Shuffler, Wies, Salas, and Burke (2010) performed a review of leadership across geographical and time zone bounds and concluded that

> Although a tremendous amount of research in the last decade has begun to disentangle interaction factors and performance outcomes associated with virtual teams, significant gaps still exist in our understanding, particularly in terms of virtual team leadership. Shared leadership may be particularly important to virtual teams, where team members' separation from the leader and from one another may necessitate the distribution of leadership functions. While the sharing of leadership has proven to be advantageous to more traditional forms of vertical leadership, there is a dearth of research concerning how

> shared leadership operates in and is influenced by, virtual and distributed environments. (p. 3)

The controversy of studying personality across culture was discussed by Church (2010), who explained that "a major contention of this article is that further theoretical and empirical advances can be achieved by integrating the diverse perspectives that address different aspects of personality across cultures. It is hoped that this article contributes to that goal" (p. 447). Understanding cultural and personality differences are both key to leadership success; however, in the contemporary global world we must go even further to acknowledge that our cultures are becoming more blended with the advent of relocation and working together and in turn take care to avoid classifying employees based on cultural backgrounds.

The literature acknowledges the challenges that are inherent in working across cultures, yet also contains a wide variety of suggestions for improvement. Grosse (2010) shared information about a course that was "designed for managers who work with intercultural virtual teams in business, government, and education" (p. 195). "Topics covered include team building, developing trust, cultural and linguistic barriers to communication, team dynamics, technology, and conflict resolution" (p. 196). Gross observed how managers "learn practical strategies and techniques for managing intercultural virtual teams and how to apply them immediately at work" (pp. 95-96). He found that "High quality managers recognize that diversity strengthens intercultural teams. They encourage each member to contribute, acknowledging that each one brings a different personal and cultural perspective to the task, enriching and extending the work of the team" (p. 201) and noted how "diversity stimulates new ideas and enhances creativity. Working in a diverse team often allows participants to appreciate different points of view and learn how other cultures behave, often erasing stereotypes." (p. 201). "Getting to know everyone's strengths and background at the beginning of each project can be very productive.

When you know about your teammates, your team can achieve success by playing to one another's strengths while minimizing weaknesses" (p. 202). It is those who acknowledge and appreciate differences that may be able to open their other teammates' through example. The potential impact of leading by example may have contributed to the results of an unpublished study I conducted surrounding cultural diversity. Focus groups were conducted with a small number of representatives from a variety of teams within one large organization. All of the participants expressed appreciation for the diversity of their teams and the fact that diversity brought their organizations new ways of approaching tasks. One of the interviewees shared how a diverse team environment reinforced the importance of living in "a colorful world" and another reflected how bringing people of different backgrounds and experiences together led for well-vetted outcomes.

Further research regarding the impact of working across cultures emphasizes the vast nature in which cultural difference impacts work environments. Global cultural leadership was reviewed extensively by Gundling, Hogan, and Cvitkovich (2011), who observed that

> There is an intense need for leaders who have both the vision and the skills to function effectively in a world that is simultaneously boundary less and replete with the boundaries that mark significant differences across a broad spectrum of business and culture; customer needs, supply chain issues, employee motivation, competition, ethical standards, legal frameworks, standard business practices, religious and political influences, educational systems, and so on. (p. 151)

Therefore, working globally is not only about how the teammates understand, appreciate, and work with each other. It is indeed much broader. There exist many other facets that must be considered when working across cultural and national bounds.

Gundling et al. (2011) identified three megatrends impacting globally diverse teams: population growth is exponentially higher in developing countries; the GDP of emerging countries is beginning to outpace those of the developed world; and rapid urbanization is

occurring in Asia and Africa. These three global trends underscore the need to think globally when thinking about key markets, companies, major sources of innovation, and the model for leadership. Kotter's (2007) notion of leadership as managing change by establishing vision and goals and aligning people and processes to accomplish the goals is primary in a global economy. As Gundling et al. (2011) explained, the

> Primary tenets of the intercultural approach include being aware of one's own culturally based values, beliefs, and assumptions; perceiving how others behave according to their own cultural lens; and leveraging differences and bridging gaps in thought and behavior to improve performance. (p. 20)

Gundling et al. (2011) went on to note that

> A challenge for many people in leadership roles as well as others working in multicultural environments is to be able to fully recognize and appreciate both commonality and difference (acceptance); then they need to transform their outlook and behaviors in a way that will make them most effective in handling the culture differences that do exist (adaptation). (p. 25)

The five stages of global leadership behaviors Gundling et al. (2011) identified as seeing the differences, closing the gap, opening the system, preserving balance, and establishing solutions. The book includes tips from global leaders in leading globally dispersed teams. Relationship was identified as a key tenant of global leadership.

> Although personal relationships are obviously important in any leadership role, our interviewees noted that global leaders must rely on others to a much greater extent because, in a foreign environment, they lack the local knowledge or skills that they would have in a more familiar territory. The leadership behavior called results through relationships highlights the fact that strong, trusting relationships are nearly always the doorway to getting things done in a global context. (p. 54)

According to Gundling et al. (2011) relationship must come first prior to focusing on the task at hand. This same idea of the importance or relationship is a basic tenet of RCT.

The importance of understanding cultural differences was highlighted by C. B. Gibson and Cohen (2003), who asserted that "It may be the subtle cultural differences that are the most

insidious in terms of influencing processes. If much culture is shared, small variations in perspectives may become big surprises" (p. 401). Context is also important when considering cultural differences. Riopelle et al. (2003) stated in the results of their detailed case study that "Contextual differences affect technology use and effectiveness in virtual teams in at least six ways: physical infrastructure, culture and language, accessibility of information, crossing time zones, team size, and maturity of the technology" (p. 241). Establishing context is an important part of effectively communicating, and especially so for virtual workers whose geographic dispersion heightens the potential for contextual misunderstanding.

The very nature of our global society and the fact that culture is so diverse and of primary importance to the individual makes working in culturally diverse environments a challenge. Virtual work teams are oftentimes made up of culturally diverse individuals requiring attention to culturally diverse dynamics. Cultural diversity is prevalent in today's workforce and is even greater in virtual work environments. Outsourcing of functions to other countries certainly puts cultural differences in the forefront, however, even in domestic U. S. companies; the incidence of working with people of diverse backgrounds has increased exponentially. Research in this area of inquiry stresses the importance of effectively working across cultures and fostering positive relationships.

This review of the common themes of virtual team connections and people, including trust and culture, revealed that much of the literature could be categorized as general advice or best practices for success. It also served to shape the focus of my research study by identifying gaps in the body of knowledge and debate among the research community. The major themes of virtual team environments included team structure and process, technology tools, communications, personal knowing and trust, and cultural inclusion. The importance of team

structure was emphasized; however ,the form of structure and who should guide the structure is of some debate among researchers. Some researchers emphasized the role of hierarchical leadership (Boehnke et al., 2003) while others identified the notion of shared or emergent leadership (Latapie & Tran, 2007). Linked to the concept of emergent leadership is the concept of communities of practice and shared knowledge, which are evident in virtual communities. In many virtual environments it is the technology tools that facilitate communications (Kerber & Buonno, 2004). All researchers emphasize the importance of effectively using technology tools; however, which tools are most effective is of some debate. Personal knowing and trust as well as cultural inclusion were identified in the literature as both imperative and evasive. Not only are they evasive, but the recommended tactics for addressing problems differ among the research community. .

The Tie to Relationship

This review of literature on virtual teams includes an emphasis on the importance of connections and collaboration, particularly with respect to the significance of relationship among team members as a key variable in the creation of trust. Maznevski and Athanassiou (2003) discussed the importance of centers of excellence to share knowledge. "Project networks for joint work allow virtual team members to combine and create knowledge by accessing and working on the same documents and other files and attending synchronous or asynchronous meetings on-line" (pp. 196-197). They went on to suggest that "Designing the social system for the knowledge management infrastructure in virtual team is best approached through the lenses of social capital and social networks" (p. 197), indicating that

> The process of obtaining information is greatly facilitated with assets in the form of relationships. Team members hear about what is important from people they know, they are alerted to potentially useful knowledge and information, and they interpret the meaning of the information in part based on its origin. Perhaps more important, good

> relationships with the right people can help team members acquire knowledge and analysis that competitors cannot obtain. The fact that virtual team members are located in physically different places provides an advantage to these teams over collocated ones. By virtue of these different locations, virtual team members naturally tap into multiple sources of information and knowledge with their relationships, and this broad spectrum of knowledge can be leveraged on behalf of the team and the organizations. (p. 198)

Research in social capital highlights that the distributed workforce requires appreciation and affirmation of the contributions each individual makes and the varied resources that they can bring to bear on projects. As Maznevski and Athanassiou (2003) asserted

> In some ways, social capital is the relabeling of something we have known for years: that relationships play a key role in a team's success. The fact that relationships are more difficult to build virtually than they are face-to-face is why the field of studying virtual teams has arisen. (pp. 199-200)

The authors noted that social networks are the conduit of social capital and that tacit and explicit knowledge are the cargo of social capital. Geographic dispersion has led virtual workers to rely on a variety of sources for information about their work environment. Maznevski and Athanassiou indicated that the concept of social capital is simply a new way of describing the important role relationship plays in the success of a team. Further research may likely reveal that social capital and relationship can be built through the constant first-hand experience of trusting relationships.

People are not simply an instrument or tool within a process. Raven (2003) emphasized that "instead of looking at individuals as just making decisions and processing information, a much richer understanding of their work and their need for support can be obtained by looking at workers as conversation makers and sense makers" (p. 293). It is clear that individuals are much more than a by-product of innovation. In the global economy, each individual brings different talents and capabilities. The challenge is to nurture and capture and reward appropriately to further the efforts of the virtual team.

Jarvenpaa and Tanriverdi (2003) summarized the importance of emergent leadership and communities of practice as follows,

> Firms nor longer operate as stand-alone entities, but create networks of customers, suppliers, and partners in order to tap into complementary knowledge resources. As a result, the locus of working, learning, and innovation shifts from structures inside the firm to a virtual knowledge network. Two forces drive the proliferation and virtualization of a firm's knowledge networks. First, information technologies make it possible to coordinate work across time and space boundaries. Second, products, services, and processes of firms are becoming more knowledge intensive. Hence a firm's value creating processes and offerings appear increasingly less tangible and more virtual to outsiders. (p. 403)

They further clarified that "In general, knowledge based intangibles are more difficult to manage and operate than physical assets" (p. 403). Important concepts to understand in this new world include the importance of virtual network leadership and the impact of trust leaders. Organizations are shifting from firm-centric to network-centric and a balance must be achieved between knowledge generation and the distribution of rewards.

In general, research on the virtual team space includes acknowledgements of the importance of people and trust. In fact, Klein and Kleinhanns (2003) observed that

> many wishful thinkers believe that virtual communication can supplant human interaction. We have found, however that the best intentions often go awry due to time pressures, and it is necessary, especially in virtual environments, to add a human link to coordinate and build relationships among virtual team members. Some might argue that an added human link is unnecessary overhead. (p. 384)

Klein and Kleinhanns further asserted that the human link is paramount. Some attempt to address the people aspects of virtual teammates by emphasizing tactical steps to take that will eventually build relationship. The exploration of relationship qualities in virtual teams can benefit from the research on relational practice in the workplace. In particular, the study of relationships from the perspective of RCT has been chosen as theoretical lens in which to examine the potential relevance of relationship constructs to virtual teams.

RCT Foundation

The beginnings of RCT may be traced to Jean Baker Miller's *Toward a New Psychology of Women* (1986). As Comstock et al. (2008) noted, it was "a groundbreaking book that has been translated into more than 20 languages" (p. 279). Robb (2007) provided an overview of RCT and the importance of variation, observing that "difference—of species, habit, coloration, size, character—gives nature depth and strength" (p. ix). Initially, RCT was called Relational Theory and focused primarily on relational practice in psychotherapy and women's development. Yet when Jordan and Walker published the third collection of papers from the Stone Center in 2004 they included an acknowledgement of the need to emphasize culture. At that time, Jordan and Walker (2004) indicated that "to place culture, alongside connection, at the center of the theory is to break a critical silence…it acknowledges that social and political values inform theories of human psychology, including those that valorize separation and autonomy" (p. 4).

Chapter I identified Fletcher's (1999) pivotal work introducing RCT into work environments (Holmes & Schnurr, 2006). The following three areas of study within RCT are specifically relevant to work environment: (1) the importance of empathy and growth-fostering relationships; (2) the five good things of clarity; empowerment; sense of purpose and self-worth, zest, and the desire; and (3) the quest for a better future. It was these concepts of connection and relationship quality that sparked my interest in applying RCT within the work environment.

Empathy and growth-fostering relationships. The concept of mutual empathy is a common thread within the RCT literature. Miller and Stiver (1997) observed that "mutual empathy is the great unsung human gift…it is a joining together based on the authentic thoughts and feelings of all the participants in a relationship" (p. 27). They continue to emphasize the fact that empathy is important and "our ability to be empathetic provides the basic foundation for

human connection" (p. 43). One must have some knowledge or appreciation of another person's context to have true empathy.

Comstock et al. (2008) provided an overview of RCT that discussed "how creating and participating in growth-fostering relationships are essential dimensions of human development and psychological well-being" (p. 279). Although her work focuses primarily on the clinical aspects of RCT; there is a strong linkage between the clinical application of RCT and that of the world of work. Consider her outline of the core RCT tenets that explicate the process of psychological growth and relational development, as summarized by Jordan in 2010, in relation to the workplace:

- People grow through and toward relationship throughout the life span.
- Movement toward mutuality rather than separation characterizes mature functioning.
- The ability to participate in increasingly complex and diversified relational networks characterizes psychological growth.
- Mutual empathy and mutual empowerment are at the core of growth-fostering relationships.
- Authenticity is necessary for real engagement in growth-fostering relationships.
- When people contribute to the development of growth fostering relationships, they grow as a result of their participation in such relationships. The goal of development is the realization of increased relational competence over the life span. (pp. 279-280)

RCT embraces the importance of mutuality and connections as a means of fulfilling a basic human need for relationship. Relationship quality is not a one-time event. It is an ongoing way of life. Yet this deviates in certain respects from standard Western ideals focused on individualism (Jordan, 1991). The work of Jordan and Walker (2004) included several key points challenging the foundations of this Western tendency toward privileging the separate self.

Recent research studies have affirmed the value of similar qualities of trust and connections (Carmeli et al., 2009; Dutton & Heaphy, 2003). RCT has allows scholars to integrate the concepts of trust and connections into an overall context of relationship that may

provide additional structure for research on the importance of relationship in virtual work environments.

Five good things. The initial overview of RCT in Chapter I included details behind the "five good things" that foster high relationship quality. The "five good things" framework provides a description of the manifestation of high-quality relationships in the individual. Miller and Stiver (1997) stated that, in a relational connection:

- Each person feels a greater sense of zest (vitality, energy)
- Each person feels more able to act and does act in the world
- Each person has a more accurate picture of her/himself and the other person(s)
- Each person feels a greater sense of worth
- Each person feels more connected to other persons and exhibits a greater motivation to connect with other people beyond those in one's primary relationships. (p. 3)

The ability to describe the impact of high relationship quality was an important first step in communicating the value of the "five good things."

The quest for a better future. As an alternative to the pitfalls of a disconnected world based on individualistic greed and competition, the work of Jordan and Walker (2004) offers encouragement for those on the quest for a better future by presenting evidence of the essential human commitment to connection between individuals and community. The enthusiasm and dedication of those following RCT is apparent in their actions and writing. Robb (2007) noted that even weeks before her death, Jean Baker Miller was still reinforcing the basic tenants of RCT and the importance of relationship quality:

> It changes everything to see and hear relationships. Not selves. Not individuals fighting or negotiating for and against separate and distinct interests and goals….It changes everything to pay attention to relationships, to hear the voice of a relationship as a dimension of your own voice and the voice of another person, or a group of people, and

> to listen to that relational voice, to see what Gilligan calls "relational reality" and sense what Herman calls the "relational field." (pp. xviii-xix)

RCT does not subscribe to the notion that one should be weak or subservient. In fact, Miller and Stiver (1997) stated that:

> Participating in connections does not mean sacrificing the individual to the group or to the team, nor does it mean being altruistic. On the contrary, it means that each individual has both the responsibility to represent her/himself as fully as possible and the responsibility to respond to others. (p. 55)

Research on virtual teams emphasizes the importance of connections, trust, and the linkage between individuals (Klein & Kleinhanns, 2003). Virtual teams are dependent upon each other to achieve their goals and are therefore responsible to each other. It is through working together that positive flow is experienced.

Measuring high quality relationships. RCT was the theoretical grounding for the development of a measure of relationship based on authenticity, engagement, and empowerment. These three factors were operationalized into a self-report inventory to measure relationship quality. Liang et al. (2002) reported the on the development and validation of the RHI inventory in the study "The Relational Health Indices: A Study of Women's Relationships." The inventory represented a means to assess relationship quality among three types of relationship or indices 1) mentors, 2) peers, and 3) community. Three conceptual dimensions of growth-fostering relationships (engagement, authenticity, and empowerment) were measured across the three types of relationship using 37 items.

Carmeli et al. (2009) also explored interpersonal relationships, yet with a particular focus on the workplace environment. They examined high-quality relationships using a quantitative survey of co-workers; incorporating categories of emotional carrying capacity, tensility, connectivity, positive regard, and mutuality to assess the impact on learning behaviors. Data

obtained through this study included perceived learning behaviors and psychological safety. Experiential measurement of high-quality relationships included mutuality and positive regard. Although their research was not directly founded on RCT, the relationship qualities of interest were similar to those measured in the RHI, such as emotional carrying capacity and mutuality. Carmeli et al.'s (2009) research confirmed the importance of high-quality relationships in the building and support of a learning organization. Their findings reaffirmed "the importance of relational underpinnings in an organization for the scaffolding of key organizational capabilities such as learning" (p. 94), revealing that

> participants in high-quality relationships feel valued and connected in ways that allow them to overcome the uncertainty that accompanies working through problems and experimenting with solutions. Thus, both the capacities and subjective experiences of being in high-quality relationships can contribute to better organizational functioning. (p. 83)

Through their research, they identified that

> in quality relationships people are able to open up and grasp their own and others' points of view more fully, enhance their attention capacities for detecting organizational signals (weak or strong) and increase their cognitive capacities regarding how to approach activities. High-quality relationships are a mechanism that provides both an enabling structure (through relationship capacities) and encouraging psychological conditions (through subjective experiences) that help foster learning behaviors in work settings. (p. 84)

This nature of research validates the positive impact of bringing together a wide variety of people with different skills and knowledge across geographical bounds united under an umbrella of virtual work teams. The work of Carmeli et al. (2009) can be applied to highly virtual teams from the perspective of developing the teams as a function of a learning organization.

A section of the Carmeli et al. (2009) study involved measuring the connectivity between teammates. As described in this review, a large portion of the virtual work literature references the importance of connections. Both the RHI and the connections items have contributed to the

study of relationship. The RHI focus on RCT and Carmeli et al. (2009) items focused on connectivity seemed to align well for the study of relationship in virtual teams. Through conversation with the authors and other researchers who had used these two scales, I decided to incorporate both scales to further the knowledge and perhaps identify synergy between the two scales.

Conclusions

The review of the literature on virtual teams has emphasized the significance of trust, connectivity, team processes, technology tools, communications, and cultural inclusion. It also revealed that research specifically on the role of relationship in virtual teams as related to (perceived success in goal achievement, job satisfaction, and relationship satisfaction). To further research in the understanding of relational variables to team outcomes, there first needs to be a relevant measure of relationship qualities. In this review, RCT and the RHI as grounded in its theoretical constructs of relationship as well as the connectivity scale by Carmeli et al. (2009) have been chosen as the most relevant tools for assessing relationship quality in virtual teams. These instruments became the foundation for development of an inventory to assess relationship quality in virtual teams in the workplace.

C. B. Gibson and Cohen (2003) indicated that "the vast majority of people involved in collaboration, armed with knowledge of what makes virtual teams special, key advantages and disadvantages, and the most critical tools for improving virtual team effectiveness, have much to gain from virtuality" (p. 420). The benefits of teaming with others no matter where they are physically located and the use of the 24-hour clock to capitalize on geographic location are two of the major benefits of working virtually (C. B. Gibson & Cohen, 2003). A deep understanding of the major advantages and how tools may be effectively used to improve the effectiveness of

virtual teams is required to fully understand the possible gains that may be obtained from working virtually. Such a perspective moves beyond the traditional real estate cost savings and work-life balance toward a positive impact to the environment and the communities in which virtual workers work and live. DeRosa, Hantula, Kock, and D'Arcy (2004) provided an optimistic way of viewing future research possibilities, indicating that society must move beyond the theoretical and into a more pragmatic, realistic environment to study this very complex topic. Virtual workers and their organizations are constantly finding new means for working with others across geographic bounds. As working virtually becomes more commonplace, it will move beyond the theoretical toward a more operational environment.

Chapter III: Methodology/ Guiding Research Questions and Research Procedures

This chapter presents an overview of the mixed method research design used in this study to explore the role of relationship in virtual work environments. It begins with a discussion of the methodological rationale for choosing a mixed method design to investigate the properties of relationship and virtual teams. The following section presents a description of the method of this study including specific design features of the mixed methods approach, participants, procedures, instrumentation, and analysis. The chapter closes with an overview of ethical considerations and a chapter summary.

Methodological Fit

The importance of thoughtfully creating a design for research is explained by Creswell (2008). He references the cover of his book as being a symbol of

> a mandala, a Hindu or Buddhist symbol of the universe. Creation of a mandala, much like creation of a research design, requires looking from the vantage point of a framework, an overall design, as well as focused attention on the detail – a mandala made of sand can take days to create because of the precise positioning of the pieces, which sometimes are individual grains of sand. The mandala also shows the interrelatedness of the parts of the whole, again reflecting research design, in which each element contributes and influences the shape of a complete study. (p. xix)

I drew from Creswell's emphasis on the importance of diligence in designing research in developing my research on the nature and influence of relationship on success in a virtual work environment. The framework of this study emulated Creswell's concept of the mandala in providing detailed data about many aspects of relationship and virtuality. Using a mixed methods approach with descriptive, correlational, and thematic analysis offered the additional "grains of sand" described by Creswell. The resulting study exposed how the different parts of the whole were related (or not) and thus contributed to the completeness of the study.

A study that has good methodological fit starts first with the questions to be researched. Each decision made during the conceptualization process should result in a purposeful decision as to how this study would result in meaningful knowledge. Two major limitations of prior research studies of virtual work environments include the primary use of small sample sizes and the employment of artificially created teams in experimental design studies. To address these limitations, this study leveraged the benefits of quantitative research by aiming for a large sample of people who work in real virtual teams.

The overall research design consists of a mixed methods, descriptive, and correlational study looking at the nature and influence of relationship on success in a virtual work environment. The quantitative part of this study tested the first four research questions and included a series of hierarchical multiple regressions performed on responses to a structured survey. The fifth research question was explored with a content analysis of participant responses to open-ended survey questions. In this study the data collection process was predominantly quantitative, open-ended fields were included to permit participants to share their views and insight. This research design is commonly known as a mixed methods study, which is quantitative with embedded qualitative in which the data collection of both is simultaneous. Expressed using Morse's (1991) nomenclature, the study used a QUAN(qual) simultaneous method to illuminate relationship and virtual constructs as well as the resulting perceived success.

Edmondson and McManus (2007) expounded upon the subject of methodological fit in an attempt to provide guidance to those "engaging in field research, studying real people, real problems and real organizations" (p. 1155). They "define methodological fit as internal consistency among elements of a research project" (p. 1155). Edmondson and McManus also

developed criteria with which the maturity of a field of study may be categorized by assessing the maturity of the research questions, types of data collected, illustrative methods of collecting data, constructs and measures, goals of data analysis, data analysis methods, and theoretical construction (p. 1180). Edmondson and McManus (2007):

> suggest that theory in management research falls along a continuum, from mature to nascent. *Mature theory* presents well-developed constructs and models that have been studied over time with increasing precision by a variety of scholars, resulting in a body of work consisting of points of broad agreement that represent cumulative knowledge gained. *Nascent theory,* in contrast, proposes tentative answers to novel questions of how and why, often merely suggesting new connections among phenomena. *Intermediate theory,* positioned between mature and nascent, presents provisional explanations of phenomena, often introducing a new construct and proposing relationships between it and established constructs. (p. 1158)

To identify the research methodology most applicable to this research study, analysis of the maturity of the two areas in which this study focuses is necessary. The area of RCT with the standardized instrument in the form of the RHI is higher on the maturity scale developed by Edmondson and McManus (2007). The maturity of RCT research may be classified as intermediate to mature and the classification of research on relationship in virtual work environments may be classified as nascent to intermediate. This variance in level of maturity of the areas of focus is one rationale for a mixed-method study. Mixed methodology has achieved support from a variety of prominent researchers.

Greene and Caracelli (1997) asserted that "the underlying premise of mixed-method rationale for mixed-method inquiry is to understand more fully, to generate deeper and broader insights, to develop important knowledge claims that respect a wider range of interests and perspectives" (p. 7). Collecting both qualitative and quantitative data enables the researcher to achieve some of the benefits of triangulation, including the ability to bring different types of data together to see where they converge. The quantitative data provides breadth of information while the qualitative adds depth. Quantitative data are considered generalizable and qualitative

data are deemed transferable. Conducting a mixed study enriches interpretation from each data set.

Method of the Study

The primary research question of this mixed method study was as follows: "What is the nature and influence of relationship on success in a virtual work environment?" Success was defined as perceived team goal achievement, job satisfaction, and relationship satisfaction.

The supporting detailed research questions included:

- Research Question 1: What is the profile of a virtual worker in terms of demographics, virtuality, relationship, and perceived success?
- Research Question 2: How important is it to virtual workers to experience high-quality relationships in a virtual work environment and how does it align to their perception of relationship?
- Research Question 3: What is the correlation between perception of relationship quality and relationship as measured by the Relational Health Indices and the Connectivity component?
- Research Question 4: What factors influence success in a virtual work environment?
- Research Question 5: What suggestions do virtual workers have for building and maintaining high-quality relationships or to improve productivity?

Analysis associated with each of these questions provided insight into relationship between team members and the various aspects of virtual work environments.

Participants. Participants in the study consisted of a convenience sample representing a wide variety of industries and roles. The one requirement for participation was that the participant was a member of a virtual team. A team was defined as a group of individuals

located in different locations who are working together through technology facilitated communication to achieve common goals. A SurveyMonkey® powered electronic online survey was hosted on my professional website to provide easy access for participants. Targeted participants were members of virtual LinkedIn Internet communities, representing a wide variety of interests and industries. Some participants operate in a global virtual network. By including an assortment of industries and a global presence component, a more complete picture of the variety of work environments was possible. The incentive to complete the survey (access to the Executive Summary of the survey results) was explained in the communications to prospective participants. The total number of responses targeted for this research was 300.

Procedures. Effective and timely communications about the research study were critical. A large sample size was instrumental to the success of this research endeavor and electronic medium is a primary way of life for those working virtually. The means to connect through Internet-enabled technology provided a vast network of resources in a variety of venues. Only one community dedicated to RCT was identified—Relational Cultural Theory (http://www.linkedin.com/groups?gid=3187346&trk=myg_ugrp_ovr) group). However, numerous online communities were identified through which those working in virtual environments communicate. Some of the sites are independently operated subscription groups. The Telework Exchange (http://teleworkexchange.com) is an example of one site that is an independently operated subscription group providing a link between proponents of virtual work environments within government and private industry reaching 33,000 members. Numerous organizations have leveraged the LinkedIn platform with which to connect. To provide an example of significant size of the LinkedIn umbrella, the eOffice–The Alternative Workspace (http://www.linkedin.com/groups/eOffice-553?home=&gid=553&trk=anet_ug_hm) has

approximately 31,000 members. Appendix C summarizes information obtained about the most active communities. LinkedIn and email were the primary tools of communications to solicit participants. Appendix D provides a picture of the page of my professional website that served as a single access point of reference for the study.

LinkedIn postings were the primary communications vehicle used to solicit potential survey respondents. In addition to postings, I sent targeted communications to LinkedIn connections. Those who received communications were asked to cascade the invitation to their colleagues. Communications to potential contributors to the research pointed to the benefits they will receive from reflecting on and sharing their experiences. A possible benefit of participation in the study (access to the Executive Summary to be posted my professional website) was also included. Messages were posted when the survey was first published and periodically during the time the survey was open. The text of the messages included rationale for participation as well as a status update for those who are interested in the results of the survey. Figure 3.1 displays an example of the initial survey invitation on LinkedIn.

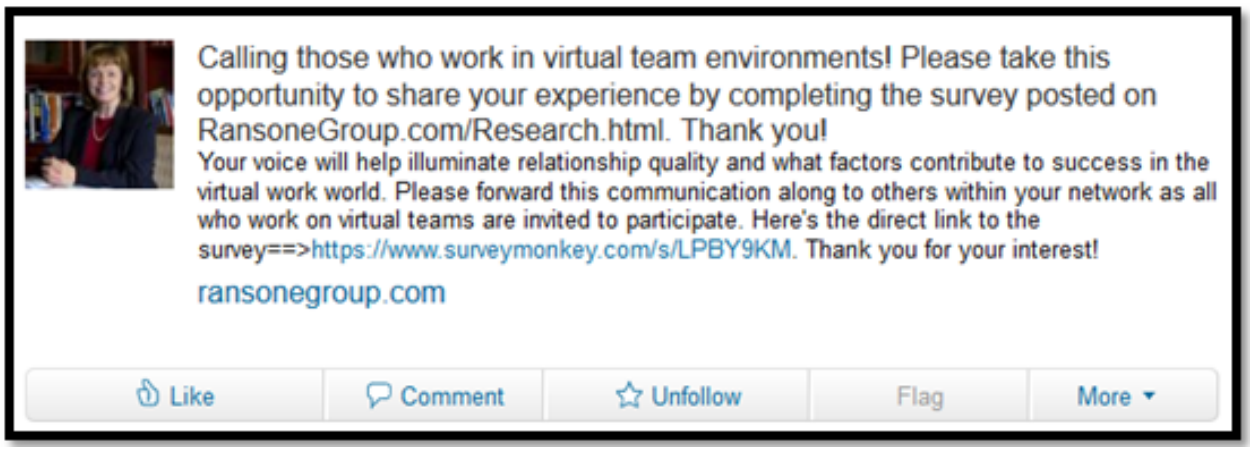


Figure 3.1. LinkedIn invitation for survey participation.

Once the initial announcements were made, the social media capabilities of LinkedIn provided additional visibility to the study. The announcements were selected as a "manager's

choice" for one of the virtual communities. Individuals "shared" the announcement within other communities. Additional conversation and communications within the LinkedIn umbrella also took place. Appendix E provides other LinkedIn correspondence examples, including: personal invitation messages; reminders for participation; the selection of the survey invitation as a "Manager's Choice"; other LinkedIn members sharing and commenting on the postings; and other posting activity.

An additional means of soliciting potential participants was through the use of business cards distributed at various events and virtual work environments. The business cards introduced the study and provided a hyperlink to the website from which possible participants were able to access the survey. Appendix F provides a sample of the business card utilized.

One of the benefits of performing a technology facilitated quantitative study is the ability to obtain a large amount of data in a short period of time. Preparation for this type of study was paramount to the success to ensure major road blocks are not experienced in the data collection or analysis phases of the study. The pilot process described earlier was an integral part of the successful development of the survey instrument.

Measurement. This study collected data quantitatively and qualitatively simultaneously utilizing an online survey deployed in SurveyMonkey®. A key aspect of effectively conducting research utilizing an electronic survey is to ensure that the survey is of the correct length and includes straightforward questions that capture data in a format supportive of analysis. Questions were vetted with colleagues and the survey itself was tested with a small contingent of individuals. Two pilots of the proposed survey were conducted during the process of developing the final survey. Feedback from the pilots was captured electronically and clarification was obtained directly from the pilot participants. The survey initially included three relationship

dimensions emulating the RHI – community, friend, and mentor. Feedback from the first pilot indicated that the length of the survey might cause this approach to lose participants. It was at that point that a decision was made to focus this research on the relationship between teammates. The change in scope of relationships to be assessed is further detailed in later section of this chapter. Pilot participants also identified the need to clarify some questions. Thanks to the diligent effort of the pilot participants, the final instrument improved the participant's experience and effectively captured a large amount of data to facilitate analysis.

The survey instrument, including the introduction, text of questions, and survey closure, is provided in Appendix G. Data were collected representing five major categories in this study: 1) respondent and team demographic, 2) relationship measures, 3) virtuality profile, 4) success measures, and 5) qualitative narrative in the form of commentary on relationships, routines and tools, and suggestions on how to improve productivity. Details about the various categories of data that were obtained through the survey instrument are provided in the next sections.

Respondent and team demographics measures. The first category of data included demographics about both the respondents and the teams they represented. The respondent demographics included items to identify gender and age. Examples of the team demographics included the industry in which the team operated, the size of the team, and how long the team had been in existence. Table 3.1 maps the demographic variables to the research and survey questions.

Table 3.1

Respondent and Team Demographic Measures

Measure Description	Survey Question	Research Question			
		1	2	3	4
Team Size	2	X	X	X	X
Tenure of Team	3	X	X	X	X
Tenure with the Team	4	X	X	X	X
Country/Cultural Background	5	X	X	X	X
Language Used	6	X	X	X	X
Team Position	7	X	X	X	X
Gender	37	X	X	X	X
Age	38	X	X	X	X
Industry	39	X	X	X	X

Relationship measures. The next category of data included in this study focused on relationship. One aspect of relationship was based on questions from two standardized instruments, the RHI and the connectivity items by Carmeli et al. (2009). The RHI measures growth-fostering connections between friends, mentors, and the community (Liang et al., 2002). The RHI instrument has been used in counseling and educational environments and has strong psychometric properties. This study pioneered the use of the RHI in work environments. The initial intent of this study was to mirror all of the RHI subscales by developing questions regarding peer relationships from the RHI-Friend subscale, team leader from the RHI-Mentor subscale, and team from the RHI-Community subscale. The survey length as well as conceptual challenges in modifying the "friend" perspective in virtual teams precluded including all of the relationships. To ensure an in-depth analysis of one aspect of relationship and to develop an instrument of an appropriate length, a decision was made to focus this research on the relationships among team members and adapt the RHI-Community subscale for use in virtual work environments.

The RHI-Community scale items designed to focus on "community" were modified to measure relationship within a team. This was accomplished with a wording change replacing the term "community" with "team." Approval of the wording changes of the RHI items was obtained from the initial developer of RHI, Dr. Belle Liang (personal communication, 2012). Components within the RHI measure authenticity; empowerment; and engagement. All three components were included in this study. The wording of four items from a connectivity scale developed by Carmeli et al. (2009) were also modified slightly to add to the initial RHI-Community items to create a proposed connectivity component. Approval for using the connectivity scale items in this study was given by Dr. Abraham Carmeli (personal communication, November 20, 2012). Appendix H provides the wording of the original items and the final wording of the items as they were employed.

The modified RHI-Community and the connectivity items by Carmeli et al. (2009) were used to create the initial version of the RHI-TEAM$_W$ original to this study. The original rating scale used for the RHI and connectivity items was a 5-point rating scale, however, this study utilized a 6-point rating scale (*1=strongly disagree and 6=strongly agree*). The 6-point rating scale provided more granularity of data. Table 3.2 provides components, items, and scoring methodology (whether the question should be scored in reverse) of the initially proposed RHI-TEAM$_W$ components.

Table 3.2

Mapping of RHI and Connectivity Questions

Component / Item
RHI-Authenticity*
Members of this team are not free to just be themselves.
There are parts of myself I feel I must hide from this team.

Component / Item
There is a lot of backbiting and gossiping in this team.
Members of this team are very competitive with each other.
RHI-Engagement
I feel a sense of belonging to this team.
If members of this team know something is bothering me, they ask me about it.
I feel understood by members of this team.
It seems as if people in this team really like me as a person.
This team provides me with emotional support.
RHI-Empowerment
I feel better about myself after my interactions with this team.
I feel mobilized to personal action after meetings within this team.
I have a greater sense of self-worth through my connection with this team.
My connections with this team are so inspiring that they motivate me to pursue relationships with other people outside this team.
This team has shaped my identity in many ways.
Carmeli et al. (2009) Connectivity
My teammates are open to listening to new ideas of others.
My teammates are open to diverse influences, even if they come from unconventional sources, such as new employees, customers, etc.
My teammates are attentive to new opportunities that can make things more efficient and effective.
My teammates know how to accept people who are different than themselves.

Note. *The four authenticity component measures were reverse scored to align with the responses within the other components.

Additional aspects of relationship were included: (1) rating of the participant's perception of the level of high-quality relationships with the team and (2) rating of the participant's perception of the importance of high-quality relationships. The rating scale used for these measures aligned with that used for the RHI-TEAM$_W$ (a 6-point rating where *1=strongly disagree and 6=strongly agree*). Table 3.3 maps the relationship variables and where they were incorporated into the analysis of the various research questions.

Table 3.3

Relationship Measures

Measure Description	Survey Question	Research Question			
		1	2	3	4
RHI-TEAM$_W$	8 & 9	x		X	X
Importance of High-quality Relationship	10a	x	X		
Perception of High-quality Relationship	10b	x	X	X	

Virtual profile measures. Information was collected to provide visibility into the virtual continuum and understand the wide variety of work environments in which virtual workers perform their jobs. Figure 3.2 identifies the three types of virtuality used in this study: (1) geographic, (2) interaction, and (3) technology tools.

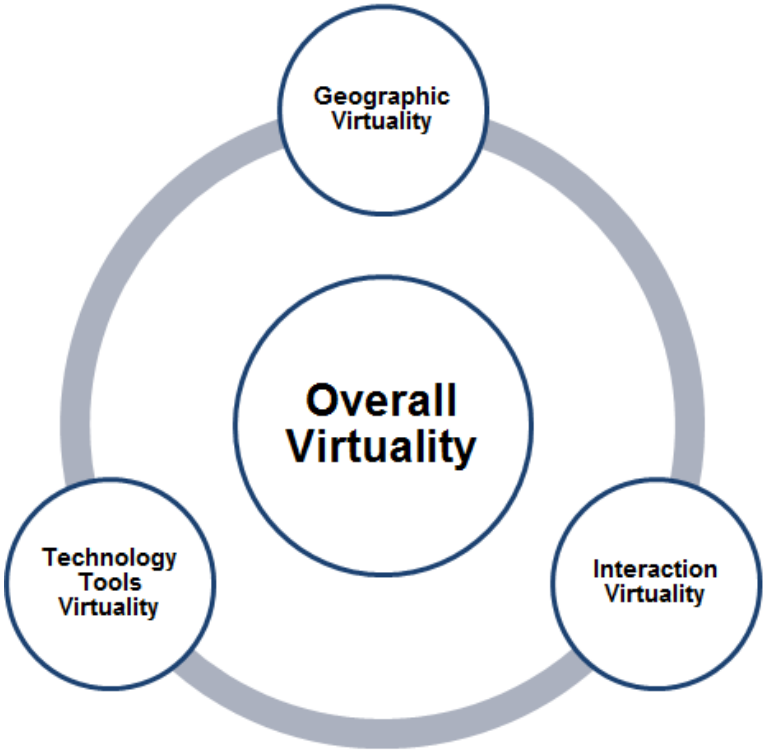


Figure 3.2. Overview of factors impacting the degree of virtuality.

The initial focus in discussion of virtuality generally tends toward geographical differences. As a result, the type of virtuality data captured in this study focused on geographical bounds. As the items were being developed for this category, I underscored the many ways geographic virtuality may be described. The participant's primary work location related to his/her teammates was captured using a number of data points. Those who work on virtual teams may in fact be located in the same building or complex as the majority of teammates. They may also not be in the same building but in the same city or local geographic area; not in the same city or local geographic area but in the same time zone; not in the same time zone but within the same country; in different countries all within the same time zone; or even in different countries, not all in the same time zone. The level of dispersion of teammates also required an understanding of what best describes the primary work locations of those on the team. This includes whether all teammates work from different primary work locations, most teammates

work from different primary work locations, there are a few locations in which most teammates work and others are distributed, or there is one location in which most teammates work and others are distributed. An individual's primary work location in relation to his/her teammates was also of interest as there may be no other teammates at the same primary work location, a few teammates are collocated, or s/he may work from the location with most of his/her teammates. Additional characteristics of the participant's primary work location supplied specifics regarding his/her physical work environment. Measurement of the type of workspace in which the participant works identified whether s/he works in an assigned or shared workspace in an office, an unassigned workspace in an office setting, a flexible work center either frequented by others within or managed outside of the organization; or home office.

The second type of virtuality this study endeavored to measure consisted of interaction within the team. This included measuring the frequency of in person face-to-face meetings that occur with all members of the team versus a few members of the team. A measurement scale was developed using a 7-point response scale where *1=daily, 2=a few times a week, 3=a few times per month, 4=monthly, 5=several times per year, 6=once per year, and 7=none*. A review of how meetings were conducted, including technology supporting them (e.g., video and/or audio tools) was also included. The survey instrument also measured the percentage of time the participant spends doing individual work, communicating with other persons virtually using technology tools (email, communicator/IM), and in-person work with another person to provide visibility as to how virtual workers accomplish their tasks.

The last area of virtuality included an assessment of the use of technology tools: (1) online text-based - not voice based tools, (2) audio conferencing tools, and (3) video conferencing tools. The frequency of use of each of the tools and how successful the team was

in utilizing the tools were rated. In addition, the comfort level of the respondent with the various tools was also included.

To test the viability of the items included in each of virtuality types, each section included a question regarding perception of virtuality at the end of each of the types of virtuality (geographic, interaction, and technology tools). Participants were asked to reflect on their perceived level of virtuality based on each particular type and asked to rate their team's virtuality on a 10-point scale where *1=not at all virtual and 10=extremely virtual*. After the three individual types of virtuality were assessed, a final question was posed to recipients asking to provide an overall virtuality rating for their team. Table 3.4 identifies where the virtuality questions were incorporated into the analysis of the various research questions.

Table 3.4

Virtual Profile Measures

Information Description	Survey Question(s)	Research Question 1	2	3	4
Geographic Virtuality					
Participant's Primary Work Location	13	x			X
Team's Primary Work Location	14 & 15	x			X
Proximity of Participant to Teammates	16	x			X
Geographic Virtuality Rating	17	x			X
Interaction Virtuality					
Meeting Frequency and Attendee Presence	18	x			X
Success in Virtual Meetings	19	x			X
Percentage of Time Allocation	20 & 21	x			X
Interaction Virtuality Rating	23	x			X
Technology Tools Virtuality					
Text-based Tool Frequency	24	x			X
Text-based Tool Team Success	25	x			X
Text-based Tool Individual Expertise	26	x			X
Audio Frequency	27	x			X
Audio Team Success	28	x			X
Audio Individual Expertise	29	x			X
Video Frequency	30	x			X

Information Description	Survey Question(s)	Research Question 1	2	3	4
Video Team Success	31	x			X
Video Individual Expertise	32	x			X
Technology Tool Virtuality Rating	33	x			X
Overall Virtuality Rating	34	x			X

Perceived success measures. Data surrounding perceived success was obtained through the participant's rating of perceived success in: (1) achieving team goals, (2) job satisfaction, and (3) overall relationship satisfaction. Respondents were asked to rate their level of agreement on a 10-point scale where *1=strongly disagree and 10=strongly agree*. Table 3.5 maps the outcome measures and where they were incorporated into the analysis of the various research questions.

Table 3.5

Perceived Outcome Measures

Information Description	Survey Question	Research Question 1	2	3	4
Team Goal Achievement	36a	x			X
Individual Job Satisfaction	36b	x			X
Overall Relationship Satisfaction	36c	x			X

Qualitative narrative. The last category of data included in this study was qualitative. It was collected in the form of responses to open-ended questions requesting that respondents reflect on how virtual workers may improve team relationships, routines, and productivity. These questions were designed to address Research Question 5 and to provide suggestions about how to improve virtual work. Table 3.6 provides the wording of the open-ended questions.

Table 3.6

Qualitative Narrative

Data Description	Survey Question(s)
Commentary on Building / Maintaining High-quality Relationships	11 & 12
Commentary on Routines / Tools	22
Suggestions to Improve Productivity	40

Now that I have defined the measurement protocols used for this study, I will present a summary of the online survey instrument.

Instrument Summary

The RHI was developed to measure relationships between friends, mentors, and community; incorporating the components of engagement; empowerment and zest; and authenticity. Connectivity items from the Carmeli et al. (2009) study were incorporated to add possible additional insight into relationship. This study provides a new means of assessing relationship by incorporating one dimension of the RHI (community) and supplementing it with four items from the Carmeli et al. (2009) study (connectivity). The questions were slightly modified for this study. Communications with key leaders in the area of measuring relationship served as reinforcement of the approach I planned to take for research on virtual teams (B. Liang, personal communication, November 2, 2012; M. L. Frey, personal communication, October 15, 2013; A. Carmeli, personal communication, November 20, 2012). Both Liang and Frey provided their insight into the RHI and encouraged the use of the RHI to measure relationship quality in work environments. Connections were such a large part of the literature about virtual teams that I sought the council of Carmeli who had developed the previously mentioned items that measure connectivity within teams. He provided further information about the items and his approval to use the items in my study. The connectivity items were also slightly modified for this study.

A survey should be written in a conversational tone and be easy for respondents to follow. The introduction to the survey provided an overview of the study, including a statement about confidentiality and instructions if one has questions. The first survey question filtered out those who do not work in a virtual work environment by branching them to the end of the survey. Baron (2012) relayed a best practice regarding demographic questions—that they should be included at the end unless they are used as a method of filtering potential respondents either in or out of the survey. This is because the initial questions should peak the respondents' interests and demographic variables are not that inherently interesting to the respondent. Some of the survey questions were binary in nature, requesting a yes or no response. Others provided ranges of options, for example, the number of times one meets face-to-face with their team. A 10-point response scale was utilized wherever appropriate to provide a continuous scale for use in the correlation and regression analyses.

The survey was designed to efficiently and effectively collect the information necessary to support this research study. Data were collected from a number of different perspectives. Relationship and virtuality were measured quantitatively and demographics provided an ability to examine specific populations. Detailed information was also obtained regarding the geographic, interaction, and technology tools aspect of virtuality. In-depth analysis as to the nature of relationship in virtual environments provides additional clarity on the importance of relationship in virtual work environments. The introduction, text of the questions, and survey closer of the online survey instrument is provided as Appendix F.

The next section of this chapter provides an overview of the analysis, including: (1) data cleaning and preparation, and (2) a summary of the data employed to respond to each of the research questions.

Analysis Overview

Review and interpretation of the study results required both quantitative and qualitative analysis techniques. This section describes the steps taken to prepare the data for analysis and to employ the planned statistical analyses as related to each of the research questions.

Data preparation. Data preparation was an iterative process. The up-front detailed design facilitated the completeness of the cases; however, there were some respondents who did not complete the survey. The point at which the respondent dropped from the survey was the determining factor as to whether to remove or retain specific cases. Incomplete cases still providing information about the respondent's relationships, geographic work environment, and the nature of interaction with teammates were retained while the cases provided by respondents who dropped earlier from the survey were removed. The remaining cases were migrated to SPSS where the assignment of labels and other preparatory work was accomplished. A review of the rationale used to eliminate cases and the cleaning and preparation of the data is included in Chapter IV.

The subsequent analysis for each research question was specifically designed based on the nature of each individual question. Techniques included descriptive, correlational, Principal Component Analysis (PCA), and thematic analyses.

- Research Question 1: What is the profile of a virtual worker in terms of demographics, virtuality, relationship, and perceived success? Research Question 1 required descriptive analysis. Mean scores, standard deviations, and percentage distributions were presented to provide a foundation for the subsequent analysis. PCA was run to identify if the modified RHI and the connectivity items by Carmeli et al. (2009) resulted in the same RHI components as found for RHI-Community.

- Research Question 2: How important is it to virtual workers to experience high-quality relationships in a virtual work environment and how does it align to their perception of relationship? Research Question 2 leveraged the descriptive analysis for Research Question 1 by using demographics to understand differences between different groups. The analysis included descriptive statistics using crosstabs and bivariate correlation analysis between the perceived importance and the existence of relationship within a team.
- Research Question 3*:* What is the correlation between perception of relationship quality and relationship as measured by the Relational Health Indices and the Connectivity component? Research Question 3 was addressed with bivariate correlations between perception of relationship quality and the RHI components that resulted from the PCA for Research Question 1.
- Research Question 4*:* What factors influence success in a virtual work environment? Research Question 4 was addressed with multivariate regression analyses. Separate analysis was required for each of the outcome or dependent variables of perceived success: (1) team goal achievement, (2) individual job satisfaction, and (3) satisfaction with team relationships. A variety of independent variables were utilized in this analysis. Team and personal demographics were the control variables in the first block of the regression. Virtuality variables were the mediating variables in the second block of the regression. The relationship components derived from the PCA run for Research Question 1 were the metrics in the third block of the regression. The presentation of results includes the results of the regression analyses, including R-

squares, F statistics, and standardized Betas. Table 3.7 provides a visual of the variables used in the regression analysis performed.

- Research Question 5: What suggestions do virtual workers have for building and maintaining high-quality relationships or to improve productivity? Research Question 5 involved a thematic analysis of qualitative data. Common themes were identified and summarized to identify the most frequently mentioned categories of commentary. Key points shared by the participants regarding building and maintaining high-quality relationships, routines, and tools, as well as productivity are presented in text form.

A detailed table of the analysis performed for each research question is provided in Appendix I. Chapter IV provides additional details of the analysis.

Table 3.7

Independent Variables in the Multivariate Regression Analysis

First Block Control Variables Demographics	Second Block Mediating Variables Virtuality	Third Block Research Variables Relationship
Country/Cultural Background	Face-to-face Meeting Frequency Grouped	Perceived Importance of Relationship
Respondent Team Position	Perceived Overall Virtuality	RHI-EE_w
Team Tenure Grouped		RHI-A_w
Gender		
Age Grouped		
Industry Grouped		
Team Size Large/Not Large		

Ethical Considerations

Performing this study required a strict adherence to the guidelines laid out by the IRB process. Approval for this research study was received from the Antioch University Institutional Review Board on April 28, 2013. Table 3.8 summarizes key areas and the rationale for the attention to detail from an ethical perspective.

Table 3.8

Ethical Considerations

Area of Attention	Rationale
Confidentiality of the participants within the participant pool	Confidentiality of all participant responses is required to ensure that the information they provide is not available to other members of their teams as it could be disruptive to the overall team dynamics.
Confidentiality among teams within an organization	Confidentiality is required outside of the participant pool to not impact a team from a reputation risk perspective or to disrupt within an organization.
Confidentiality outside the participant pool	Confidentiality is required outside of the participant pool to not impact a team or organization from reputation risk.

Summary

Utilizing a mixed methods approach, this study obtained data that was primarily quantitative with embedded qualitative data. All data were obtained simultaneously through the use of an electronic survey instrument powered by SurveyMonkey®. The social networking tool LinkedIn was the primary method of participant solicitation. Targeted participants were those who worked on virtual teams. Chapter IV provides the details surrounding convenience sample of 410 respondents who initiated the survey and the 256 cases that were selected for the detailed

analysis. Five survey questions were analyzed using a variety of techniques: (1) descriptive, (2) Principal Component Analysis with factor loading, (3) correlational, (4) bivariate correlational, and (5) multivariate correlational.

Chapter IV: Results

The objective of this study was to understand the nature and influence of relationship on success in a virtual work environment. Five research questions were posed to guide the exploration of this topic. This chapter presents the findings of the research in relation to the statistical analyses of research questions one through four and the thematic analysis of research question 5. The overarching research question was as follows: "What is the nature and influence of relationship on success in a virtual work environment?" Success was defined as perceived team goal achievement, job satisfaction, and relationship satisfaction.

The supporting detailed research questions included:

- Research Question 1: What is the profile of a virtual worker in terms of demographics, virtuality, relationship, and perceived success?
- Research Question 2: How important is it to virtual workers to experience high-quality relationships in a virtual work environment and how does it align to their perception of relationship?
- Research Question 3: What is the correlation between perception of relationship quality and relationship as measured by the Relational Health Indices and the Connectivity component?
- Research Question 4: What factors influence success in a virtual work environment?
- Research Question 5: What suggestions do virtual workers have for building and maintaining high-quality relationships or to improve productivity?

This chapter begins with the screening and preparation of the data for detailed analysis. Examples of the types of preparation required included: 1) identifying completed surveys, 2) making decisions regarding missing data, 2) reverse coding of some variables to align the data to

other variables, and 3) recoding some variables to facilitate analysis. This is followed by a detailed review of each of the research questions will be presented, and, finally, a conclusion of the analysis.

Survey Completion

The first task in preparing the data for analysis was to identify the reasons that a respondent dropped out of the survey. As described in Chapter Three, LinkedIn provided the portal to reach potential respondents and SurveyMonkey® provided the mechanism for data capture. A total of 410 individuals began the survey. A new variable, Dropped at Question, was created to identify the point at which the respondents exited the survey. I then reviewed the Dropped at Question variable to determine whether to include the case in some of the analysis and to hypothesize why the exiting took place. Table 4.1 provides a summary of where individuals exited the survey.

Table 4.1

Percentage Distribution for Survey Completion Status

Dropped at Question	Frequency	Percent
Question 1 - Not Virtual Team Member	37	9.0%
Question 2 - Team Size	25	6.1%
Question 8 - 1st Grouping of RHI Questions	20	4.9%
Question 9 - 2nd Grouping of RHI Questions	26	6.3%
Question 13 - 1st Primary Work Location	8	2.0%
Question 18 – Meetings	19	4.6%
Question 24 Tech Text Frequency	4	1.0%
Question 25 Tech Text Success / Comfort	2	0.5%
Did not drop - Completed Survey	269	65.6%
N=410		

The first question of the survey provided the following definition of a virtual team to determine whether the potential respondent was a part of the targeted population: A virtual team is defined as a group of individuals located in different locations who are working together

through technology facilitated communication to achieve common goals. Are you a member of a virtual team? Of the 410 respondents, 37 indicated that they were not part of a virtual team and exited the survey after question 1. These cases were not included in the analysis. This left 373 potentially complete surveys.

The second section of the survey requested information about the team in which the individual worked, including the team size, longevity of the team, membership within the team, as well as whether the team members were of the same country/cultural background and used English as the primary means for communication. It was at this point that 25 potential participants aborted the survey and were not included in the analysis. This left 348 potentially complete surveys. One theory as to why potential participants exited after questions about the team is that following these questions the respondent realized that s/he was not part of a team and perhaps was an individual contributor who also worked virtually. Or, possibly, the person was part of many teams and identifying one specific team was difficult. One participant expressed this within the comments about virtuality, stating that "the specific team I'm responding about is U.S. domestic; however, I could have selected from any number of teams."

The third section of questions included Likert-type items measuring relationship. A total of 46 respondents exited the survey during this series of relationship questions. This potentially left 302 completed surveys. Text from an email received from one respondent who began the survey but ended during the relationship section perhaps explains some reasons respondents may have exited the survey in the relationship section.

> I tried to take the survey but found that I wanted to skip many questions. Having been in the workforce for many years and in a virtual environment for almost 15 years I found many of the questions difficult to answer. Maybe it is because I have been doing this for so long and in a very professional environment but I found the questions about the team contributing to my self-worth and esteem difficult to answer. Since the survey would not let me opt out of any of the questions I had to end the survey.

The next section covered information about an individual's primary work location and meeting interaction. A total of 27 potential participants opted out of the survey in the work location and meeting interaction section. These two areas of data were necessary to fully understand the virtual work environment and therefore these cases were excluded from the analysis. This potentially left 275 completed surveys.

Five participants exited the survey within the section on technology tools and text messaging. These cases did provide information about relationships, their geographic work environment, and the nature of interaction with teammates. Since these surveys were almost complete and provided very worthwhile information, these five cases were retained for analysis; therefore, there were still 275 potentially complete surveys.

Detailed review of the 275 cases identified 19 surveys that needed to be eliminated from this study. One case was removed because all of the free-form comments fields were unintelligible. The remaining 18 cases were eliminated either due to the small size of the team (2 team members) or because they were not truly virtual in that they met face-to-face with most or all of the team daily, or the total percent face-to-face time was greater than 40%. The final number of usable, completed surveys from respondents who worked on a virtual team was 256.

Data Preparation

All data were downloaded to SPSS to examine completeness and consistency of data. The import process from SurveyMonkey® did not always correctly categorize the variable type (numeric or string) or measure (nominal or scale) each of the variables represented. Some of the numeric variables were incorrectly represented using decimal places. The appropriate characteristics were defined for each variable and changes were made within SPSS.

Data for a few of the variables required some modifications. The percentage of time spent performing individual, virtual, face-to-face, and other activities were captured at a detailed level. Specific percentages were provided. Where possible, comments describing the type of activity included in the "other" category were used to recode the other activity into the individual, virtual, or face-to-face category. Some technology and perceived virtuality ratings were missing due to the inclusion of the five cases where respondents exited the survey in the technology section. In addition, a survey branching problem that was discovered and corrected early in the data collection process left four cases with no data for just the technology virtuality rating. In both cases these missing data were replaced with the appropriate mean scores.

Reverse coding. To align the results of similar items, reverse scoring was required. The RHI incorporated four "authentic" component items that were written with negative meaning and thus needed to be reverse scored to align with the other relationship items. Table 4.2 provides a listing of the reverse coded variables that realign the authentic RHI items with the other RHI items:

Table 4.2

Reverse Coded Items

Item
Members of this team are not free to just be themselves.
There are parts of myself I feel I must hide from this team.
There is a lot of backbiting and gossiping in this team.
Members of this team are very competitive with each other.

Recoded variables. Several of the survey questions were designed to capture information at a detailed level to provide the raw scale-type data that could also be recoded into grouped categories. For example, the specific number of people on each team was aggregated into the following groups: 3 to 5, 6 to 10, 11 to 20, 21 to 50, and 51 to 200 team members.

Another example of variables recoded into grouped categories was the industry demographic. Survey respondents worked in 23 types of industries, with about half from financial services and technology and another one-third from education, real estate, human resources, architecture, non-profit associations, and manufacturing. The industries less frequently represented were grouped together into an "other" category. The age of respondent variable was recoded into under 50 years of age or 50 years of age or older categories. Another variable was created to identify whether the team had been in existence for over or under a year. The perception of virtuality variables were used to create new variables indicating whether the respondent perceived their virtuality as "not high" or "high" based on the rating they gave on a ten-point scale, with *1-7=not high and 8-10=high*. Table 4.3 provides a listing of the recoded variables.

Table 4.3

Recoded Variable Codes

Variable	Code
Team Size in 5 Groups	• 3-5 people • 6-10 people • 11-20 people • 21-50 people • 51-200 people
Team Size in 2 Groups	• Not Large: 3-10 people • Large: 11-200 people
Respondent Team Tenure in 2 Groups	• Not Long: 0 months – 1 year • Long: 1 year and over
Primary Work Location of Participant	• Assigned or unassigned space in a building • Flexible work center • Home office
Primary Physical Location of Teammates	• Local – Same Geographic Area • Same Country • Different Countries

Variable	Code
Proximity of Teammates	• One or a Few Locations • Most Work From Different Locations • All Work from Different Locations
Face-to-face Meeting Frequency	• Value of 0: Never Meet Face-to-face • Value of 1: Meet Face-to-face Daily – 1/year
Frequency of Technology Tool Use • Online Text-based Tools • Audio Conferencing Tools • Video Conferencing Tools	• Low: Once Per Year or None • Medium: Several Times per Year, Monthly, A Few Times per Month • High: A Few Times Per Week or Daily
Technology Tool Team Success • Online Text-based Tools Success • Audio Conferencing Tools Success • Video Conferencing Tools Success	• Low: Strongly Disagree or Disagree • Medium: Somewhat Disagree, Neutral, or Somewhat Agree • High: Agree or Strongly Agree
Technology Tool Personal Comfort • Online Text-based Tools Expertise • Audio Conferencing Tools Expertise • Video Conferencing Tools Expertise	• Low: Extremely Uncomfortable or Uncomfortable • Medium: Somewhat Uncomfortable, Neutral, or Somewhat Comfortable • High: Comfortable or Extremely Comfortable
Perception of Geographic Virtuality Rating in 2 Groups	• Not High rating of 1-7 • High rating of 8-10
Perception of Interaction Virtuality in 2 Groups	• Not High rating of 1-7 • High rating of 8-10
Perception of Technology Tools Virtuality in 2 Groups	• Not High rating of 1-7 • High rating of 8-10
Perception of Overall Virtuality in 2 Groups	• Not High rating of 1-7 • High rating of 8-10
Industry in 2 Groups	• Financial Services or Technology • All other industries

Variable	Code
Industry in 8 Groups	• Architecture • Education • Financial Services • Human Resources • Non-profit Associations • Real Estate • Technology • All other industries
Respondent Age in 2 Groups	• Under 50 years of age • 50 years of age and over

At the completion of the data preparation the final number of respondents included in the subsequent analysis related to each research question was 256.

Research Question 1

There were four areas of analysis related to Research Question 1, What is the profile of a virtual worker in terms of demographics, virtuality, relationship, and perceived success?—demographic profile, relationship measure, virtuality measures, and perceived success. The first analysis performed consisted of running descriptive statistics on respondent personal and team demographic data. It should be noted at this juncture that the majority of the respondents worked on teams that were physically located within the same country (69.5%) while 30.5% were on teams physically located in different countries. Additional details regarding geographic differences will be presented in the virtuality section. Respondent demographics were described for gender and age. Females dominated the participant pool, representing 58.6% of the population. About two-thirds of the survey respondents were between 40 and 49 (30.7%) or 50 and 59 (35.1%) years of age. Table 4.4 provides respondent demographics of the participant pool.

Table 4.4

Percentage Distributions for Respondent Demographics

Variables/Codes	Percent
Respondent Gender	
Male	41.4%
Female	58.6%
Respondent Age	
21-29 years	5.2%
30-39 years	18.7%
40-49 years	30.7%
50-59 years	35.1%
60+ years	10.4%
Respondent Age in 2 Groups	
Under 50 years	54.6%
50 years or over	45.4%
N=251*	

*Five respondents did not complete personal demographics

This study focused on team dynamics; therefore team demographics were also included. A wide variety of industries were represented. The financial services industry was dominant, with 35.1% indicating they were from that industry. Other large industry groups were technology and education (14.7% and 10.0% respectively). The number of team members varied significantly, ranging from 3 to 200 persons. The percentage distribution for team size showed that half (50.0%) of the teams ranged from 3 to 10 individuals and half (50%) from 11 to 200 plus, with most of the larger teams having 11 to 20 members (29.3%) or 21 to 50 members (20.7%). Longevity of the team and length of time on the team were also measured. The majority of the virtual teams (64.5%) had been in existence for more than 2 years. Teams in existence for 1-2 years represented 16.0% of the population. Likewise, the length of time the

participants had been a team member was also longer in duration with 52.7% indicating they had been a member of their virtual team for over 2 years. Culturally the teams were evenly split with about half of survey respondents (43.4%) indicating that all their team members were of the same country/ cultural background and about half (56.6%) indicating their team members were not all from the same cultural background. Almost all (97.7%) of the respondents' teams conducted business in English. Respondents were both team members (39.1%) and team leaders (60.9%). Table 4.5 provides the team demographics of the participant pool.

Table 4.5

Percentage Distributions for Team Demographics

Variables/Codes	Percent
Team Size in 5 Groups	
3-5 people	18.0%
6-10 people	32.0%
11-20 people	29.3%
21-50 people	13.7%
51-200 people	7.0%
N=256	
Team Size in 2 Groups	
Not Large: 3-10 people	50.0%
Large: 11-200 people	50.0%
N=256	
Team Duration	
0-3 months	2.0%
3-6 months	8.2%
6 months – 1 year	9.4%
1-2 years	16.0%
Over 2 years	64.5%
N=256	
Respondent Team Tenure	
0-3 months	5.1%
3-6 months	9.0%

Variables/Codes	Percent
6 months – 1 year	14.5%
1-2 years	18.8%
Over 2 years	52.7%
N=256	
Respondent Team Tenure in 2 Groups	
0-1 year	28.5%
Over 1 year	71.5%
N=256	
Country/ Cultural Background of Team Members	
Same	43.4%
Different	56.6%
N=256	
Primary Language is English	
Yes	97.7%
No	2.3%
N=256	
Respondent Team Position	
Team Leader	39.1%
Team Member	60.9%
N=256	
Industry in 2 Groups	
Financial Services or Technology	49.8%
All Other	50.2%
Industry in 8 Groups	
Financial Services	35.1%
Technology	14.7%
Education	10.0%
Real Estate	5.6%
Human Resources	4.8%
Architecture	4.0%
Non-profit Associations	3.2%
Manufacturing	3.2%
All Other (less than 3.0% within a specific industry)	24.2%
N=251	

Once descriptive analysis of the demographic data was complete, the descriptive analysis continued in the area of relationships.

Relationship—descriptive analysis. Relationship was measured in two ways. The first set of items used a modified version of the community index from the RHI presented by Liang et al. (2002) and incorporated some modified connectivity items originally presented by Carmeli et al. (2009). The second set of relationship questions measured the perception of relationship and importance of relationship each on a 10-point scale.

Both sets of questions used Likert-type response items from which the respondent chose their level of agreement. Although the original connectivity items and the RHI were measured by 5-point scales, this study utilized a 6-point scale. The 6-point scale provided for additional variability and eliminated a "neutral" response, requiring respondents to select either some level of agreement or disagreement. Choices included *1=strongly disagree, 2=disagree, 3=somewhat disagree, 4=somewhat agree, 5=agree, and 6=strongly agree*. The measures of skewness were all under 1.5 and most measures of kurtosis were under 3.0. Blaikie (2003) suggested that +/-3.0 can be acceptable for measures of skewness and kurtosis.

The 18 relationship items included 14 adjusted to focus on teams from the original RHI and four additional modified connectivity items. The original overall RHI scale included three components: engagement, empowerment, and authenticity. The four connectivity items were suggested as a possible enhancement to the RHI. Table 4.6 shows the mean, standard deviation, skewness, and kurtosis for the modified RHI and connectivity items used in this study.

Table 4.6

Descriptive Statistics for the Modified RHI and Connectivity Items

Components / Items	Mean	(SD)	Skewness	Kurtosis
Engagement				
I feel a sense of belonging to this team.	5.08	1.003	-1.498	3.047
If members of this team know something is bothering me, they ask me about it.	4.29	1.165	-.602	-.074
I feel understood by members of this team.	4.73	.913	-.968	1.109
It seems as if people in this team really like me as a person.	4.84	.846	-1.295	3.724
This team provides me with emotional support.	3.75	1.329	-.383	-.503
Empowerment				
I feel better about myself after my Interactions with this team.	4.71	1.037	-.938	1.388
I feel mobilized to personal action after meetings within this team.	4.71	1.068	-1.000	1.195
I have a greater sense of self-worth through my connection with this team.	4.24	1.156	-.515	-.076
My connections with this team are so inspiring that they motivate me to pursue relationships with other people outside this team.	3.63	1.258	-.152	-.635
This team has shaped my identity in many ways.	3.42	1.332	-.026	-.850
Authenticity				
Members of this team are not free to just be themselves.	4.62	1.231	-.927	.188
There are parts of myself I feel I must hide from this team.	4.16	1.365	-.477	-.544

Components / Items	Mean	(SD)	Skewness	Kurtosis
There is a lot of backbiting and gossiping in this team.	4.82	1.039	-.891	.505
Members of this team are very competitive with each other.	4.15	1.347	-.283	-.961
Connectivity				
My teammates are open to listening to new ideas of others.	5.17	.818	-1.368	3.558
My teammates are open to diverse influences, even if they come from unconventional sources, such as new employees, customers, etc.	4.72	.916	-.834	1.197
My teammates are attentive to new opportunities that can make things more efficient and effective.	4.72	1.028	-.952	1.173
My teammates know how to accept people who are different than themselves.	4.77	.892	-.976	1.875

Note. The four authenticity component measures were reverse scored to align with the response scale direction of the other items. The items were measured on a scale of 1 (strongly disagree) to 6 (strongly agree). For example, a mean score of 3.75 lies between somewhat disagree and somewhat agree; a mean score of 4.72 lies between somewhat agree and agree; and a mean score of 5.08 lies between agree and strongly agree.

Three of the items were outside the kurtosis guidelines, as follows:

- I feel a sense of belonging to this team.
- It seems as if people in this team really like me as a person.
- My teammates are open to listening to new ideas of others.

Although the measure of kurtosis for three items was higher than the recommended + - 3.0, in an attempt to start the factor analysis with all the original, RHI items the decision was made to conduct the analysis with all items despite their slightly higher than 3.0 measure of kurtosis.

Relationship measure—principal component analysis (PCA). Additional preliminary analysis, including bivariate correlations and a measure of sampling adequacy, was needed to establish which items were appropriate for the PCA and if the sample was large enough for the PCA analysis. All of the modified RHI and connectivity items had a statistically significant correlation of =>.30 with at least one other item in their component group, implying that they all fit within the overarching relationship construct. The Kaiser-Meyer114 Olkin Measure of Sampling Adequacy was .90, indicating that the sample size of 256 was sufficient for factor analyses.

PCA with varimax rotation was used to identify the components in the set of modified RHI and connectivity items for this virtual team member data set. The intent of this exercise was to confirm that the original RHI items were appropriate for this population with the team-language modification and to determine whether the modified connectivity items added to the viability of measuring relationship. SPSS was used to run PCA with varimax rotation. Stevens (2009) suggested reliable factor loading cutoffs based on sample size, indicating that "components with about 10 or more low (.40) loadings are reliable as long as the sample size is greater than about 150" (p. 333). Cut-offs of 0.35 to 0.40 are commonly used in exploratory research. To clearly understand the nature of the relationship between the original RHI items and the connectivity items, several PCA decision rule options were considered and tested using the following parameters:

- Loading cut-offs of .35 and .40
- Including/excluding the high kurtosis and skewness items
- Including/excluding the connectivity items.

For each of the trial PCA runs, items were eliminated if an item loaded on more than one component based on the specified loading cut-off or if it did not load on any of the components. Results from all variations of the trial PCA runs were similar. Upon review of the results, two key findings were apparent: (1) the new connectivity items did not add to the measuring of relationship; and (2) the modified RHI items contained two components. The connectivity items consistently either cross loaded on multiple components or did not load at all. They also consistently were eliminated in early iterations before the final iteration for each PCA run. Based on observations from the trial PCA runs, the final PCA decision rules were:

- A .40 cut-off for loadings
- Exclusion of connectivity items
- Inclusion of all modified RHI items, regardless of measures of kurtosis > 3.0

The varimax rotated component loadings were reviewed to identify those items that loaded on more than one component with values greater than or equal to the 0.40 cut-off. In addition, the scree plots visually identified the appropriate expected number of components by where the plotted line turned sharply right. Two iterations of the Principal Component Analysis were required to align the items into the resulting two components. The three items eliminated were:

- I feel a sense of belonging to this team.
- I feel understood by members of this team.
- I feel mobilized to personal action after meetings within this team.

The two components were authenticity and engagement/empowerment. The Scree plot also showed that a two component solution was appropriate. These two components explained 87.4% of the variance in the items.

Given the alignment of the two resulting components to components within the original RHI and the fact that they could be easily labeled, a decision was made to label the broad (two component) construct as Relational Health Index at Work within Teams or RHI-TEAM$_W$. Thus, the overall construct consists of two components: (1) Engagement/Empowerment or RHI-EE$_W$ and (2) Authentic or RHI-A$_W$. Table 4.7 provides the items and loadings for the two new team relationship subscales.

Table 4.7

Principal Component Analysis Components and Loadings for the RHI-TEAM$_W$

RHI-TEAM$_W$ Component / Items	RHI-EE$_W$	RHI-A$_W$
Engagement/Empowerment (α=.855)		
If members of this team know something is bothering me, they ask me about it.	0.59	
It seems as if people in this team really like me as a person.	0.56	
This team provides me with emotional support.	0.75	
I feel better about myself after my interactions with this team.	0.66	
I have a greater sense of self-worth through my connection with this team.	0.80	
My connections with this team are so inspiring that they motivate me to pursue relationships with other people outside this team.	0.81	
This team has shaped my identity in many ways.	0.78	
Authenticity (α=.649)		
Members of this team are not free to just be themselves.		0.67
There are parts of myself I feel I must hide from this team.		0.59
There is a lot of backbiting and gossiping in this team.		0.77
Members of this team are very competitive with each other.		0.68

Note. The four authenticity items were reverse scored to align with the other modified RHI items. Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization. α=.831 for the entire measure.

The factor loading for each item was used as the relative within component weight to calculate a composite score for each component of the RHI-TEAM$_W$. This emulated the initial development of the RHI (Liang et al., 2002). The respondent's rating for each of the items was multiplied by the factor loading. These weighted scores were then averaged and adjusted by a constant to make the component score results intuitive. That is, to show their mean scores as falling between the codes of *1=strongly disagree and 6=strongly agree*. The overall component means score for Engagement and Empowerment (RHI-EE$_W$) is *M*=4.07 and Authentic (RHI-A$_W$) *M*=4.46, both between somewhat agree and agree.

The central theme of this research was the study of relationship through the development of the newly defined RHI-TEAM$_W$ components and to assess aspects of the virtual work environment by defining a means to measure the level of virtuality.

Virtuality profile: Descriptive analysis. Categories of virtuality were identified in this study as geographic dispersion, level of interaction, and use of technology tools. Each of these categories was measured at a detailed level and an overall perceived level of virtuality. Respondents were asked to provide details about their work location in relation to their teams, the types of interaction they have with their teammates, and their use of, success with, and expertise in specific technology tools. Appendix J provides detailed information about the virtuality variables.

As shown on Table 4.4, responses to the virtuality variables were recoded into response code groupings to facilitate analysis. Analysis focuses on these recoded variables. More than half (55.5%) of the survey respondents worked from home. The majority of respondents

(69.5%) worked on teams located in the same country (11.7% in the same local geographic area and 57.8% outside the local geographic area but within the same country) and 30.5% who worked on teams that are spread across multiple countries. The primary relative work location of the respondents varied; however, three-fourths of the respondents worked on teams where most (33.2%) or all (41.4%) worked from different locations. Almost two-thirds (61.7%) worked in a location without other teammates, while the remaining respondents worked in a location where a few (30.1%) or most (8.2%) teammates worked. Table 4.8 provides the percentage distributions for the geographic virtuality recoded variables.

Table 4.8

Percentage Distributions for Recoded Geographic Virtuality Variables

Variables/Codes	Percentage
Primary Work Location of Participant	
Assigned or unassigned space in a building	38.3%
Flexible Work Center	6.3%
Home Office	55.5%
Primary Physical Location of Teammates	
Local – Same Geographic Area	11.7%
Same Country	57.8%
Different Countries	30.5%
Proximity of Teammates	
One or a Few Locations	25.4%
Most Work from Different Locations	33.2%
All Work from Different Locations	41.4%
Primary Work Location Compared to Teammates	
Location Where Most of the Teammates Work	8.2%
Location Where a Few Teammates Work	30.1%
Location Where None of the Teammates Work	61.7%
N=256	

The next category of virtuality included an assessment of how team members interact. On average, over 50%of a virtual worker's time is spent doing individual work. Close to 40% of their time is spent communicating virtually with others and approximately 11%of their time is spent doing in person work with another person. The large standard deviations show that there was a wide variability in the percent of time in each of the identified activities. Table 4.9 provides the details on how virtual workers spend their time.

Table 4.9

Mean Percent of Time Virtual Workers Spend on Activity

Activity	Mean %*	(SD)	Skewness	Kurtosis
Doing individual work	51.32%	22.177	-.149	-.993
Communicating with other persons virtually	37.38%	20.430	.636	-.232
Doing in person tasks with another	11.19%	10.306	.989	.425
N=256				

*Other miscellaneous tasks accounted for .11% of the total time.

Another way to measure team interaction is to understand the frequency of meetings where participants are face-to-face. Respondents were asked to indicate the frequency with which they met with all or most of their teammates in face-to-face meetings. More than one-third (38.1%) of survey respondents indicated they never have meetings where most or all attendees are face to face. Another 20.7% have face-to-face meetings with most or all team members once per year and 24.2% have them several times per year. The remaining 17.0% have face-to-face meetings with all or most team members at least monthly, with a small group (5.3%) meeting with others a few times a week or daily. Table 4.10 shows the percentage distribution for the frequency of face-to-face meetings with all or most team members.

Table 4.10

Percentage Distribution for Frequency of Face-to-Face Meetings with All or Most Team Members

Codes	Percentage
None	38.1%
Once per year	20.7%
Several times per year	24.2%
Monthly	4.5%
A few times per month	7.2%
A few times per week	4.3%
Daily	1.0%
N=256	

The last category of detailed virtuality information was in the area of technology tools. Use of technology tools varies across the virtual working population. Three types of technology tools were assessed in this study:

- Text-based – not voice based tools (Instant Messaging, Communicator, non-video Skype, etc.)
- Audio conferencing tools (Teleconference, bridge line, etc.)
- Video conferencing tools (TelePresence, video Skype, Go to Meeting, etc.)

Most (88.9%) used text-based tools either weekly or daily. About three-fourths (75.3%) used audio conferencing tools. Video conferencing is used much less frequently by virtual workers. Although 28.7% of virtual workers use video conferencing daily or weekly, 27.9% have never experienced using these visual tools (see Table 4.11).

Table 4.11

Percentage Distributions for Frequency of Use of Technology Tools

Variable/Codes	Percentage
Online Text-based Tools Usage	
High (ratings A Few Times Per Week or Daily)	88.9%
Medium (Several Times per Year, Monthly, A Few Times per Month)	6.7%
Low (Once Per Year or None)r	4.3%
N=253	
Audio Conferencing Tools Usage	
High (ratings A Few Times Per Week or Daily)	75.3%
Medium (Several Times per Year, Monthly, A Few Times per Month)	20.3%
Low (Once Per Year or None)r	4.4%
N=251	
Video Conferencing Tools Usage	
High (ratings A Few Times Per Week or Daily)	28.7%
Medium (Several Times per Year, Monthly, A Few Times per Month)	43.4%
Low (Once Per Year or None)r	27.9%
N=251	

Team success and individual expertise in using technology tools is a key part of adoption of various tools available to connect teammates. Respondents who indicated they had used each of the tools also rated their team success and individual expertise with using the tools. The total percentage of all respondents who indicated they used text based tools was 94.8%, the percentage of those who had used audio conferencing tools was 96.0%, and the percentage of those who had used video conferencing tools was 77.3%.

Of those who used the tools, respondents who used audio tools rated their comfort level and team's success with audio tools somewhat higher than text users rated their experience with text-based tools and video users rated video-based tools. Over 90% of audio users indicated that they were either comfortable or extremely comfortable using audio tools and 84.6% indicated that their teams had success using the audio tools. Text users were extremely comfortable or comfortable with text-based tools (87.5%) and agree or strongly agree (79.2%) that the team successfully uses the text-based tools. Of those respondents who have used video conferencing tools (77.3%), slightly more than half (55.7%) indicated that their team successfully utilizes the tools and 67.0% indicated they were extremely comfortable or comfortable with video conferencing. Table 4.12 shows the percentage distributions for perceived success of technology tool usage and the respondents self-rated level of comfort with the tool.

Table 4.12

Percent Perceived Team Success and Personal Comfort with Technology Tools

Variables/Codes	Percentage
Online Text-based Tools Success and Expertise	
Agree or strongly agree that the team successfully uses the tool	79.2%
Comfortable or extremely comfortable with using the tool	87.5%
N=240	
Audio Conferencing Tools Success and Expertise	
Agree or strongly agree that the team successfully uses the tool	84.6%

Variables/Codes	Percentage
Comfortable or extremely comfortable with using the tool with the tool N=241	90.5%
Video Conferencing Tools Success and Expertise	
Agree or strongly agree that the team successfully uses the tool	55.7%
Comfortable or extremely comfortable with using the tool N=194	67.0%

At the end of each of the detailed virtuality profile categories (geography, interaction, and technology), respondents were asked to reflect on that aspect and rate their perceived level of virtuality. For example, after the geographic related items, the following question was posed:

> One way to think about how virtual a team is may be related to geographic dispersion. Reflecting on your team's geographic dispersion, how "virtual" would you rate your team?

At the end of all three of the virtuality sections, participants were asked to rate on a scale of *1=not at all to 10=extremely* the Perceived Overall Virtuality of their team. Table 4.13 provides the mean, standard deviation, skewness, and kurtosis for the perceived virtuality items.

Table 4.13

Mean Scores and Descriptive Statistics for Perceived Virtuality Variables

Variables	Mean	(SD)	Skewness	Kurtosis
Perceived Geographic Virtuality	8.26	1.871	-1.132	.875
Perceived Interaction Virtuality	8.34	1.726	-1.456	2.889
Perceived Technology Virtuality	8.29	1.88	-1.335	1.457
Perceived Overall Virtuality N=256	8.52	1.74	-1.501	2.360

The mean scores provided in Table 4.14 are consistent across the three aspects of virtuality and the Perceived Overall Virtuality measures. As was previously presented for the geographic, interaction, and technology tools the virtuality scale responses were also recoded into a category variable with "high" for codes of 8 to 10, and "not high" for codes below 8 (see Table 4.14).

Table 4.14

Percent High and Not High Ratings for Perceived Virtuality

Variables/Codes	Percentage
Geographic Virtuality in 2 Groups	
Not High (Rating 1-7)	30.1%
High (Rating 8-10)	69.9%
Interaction Virtuality in 2 Groups	
Not High (Rating 1-7)	26.6%
High (Rating 8-10)	73.4%
Technology Tools Virtuality in 2 Groups	
Not High (Rating 1-7)	26.2%
High (Rating 8-10)	73.8%
Overall Virtuality in 2 Groups	
Not High (Rating 1-7)	21.9%
High (Rating 8-10)	78.1%
N=256	

Virtuality: Correlational analysis. Correlation analysis was run with the 10-point perception of virtuality rating scales. These correlations show the relationship between the four perceptions of virtuality ratings (see Table 4.15).

Table 4.15

Pearson Correlation for the Perceived Degree of Virtuality Rating Variables

Variables	1	2	3	4
1 Perceived Geographic Virtuality	1			
2 Perceived Interaction Virtuality	.696**	1		
3 Perceived Technology Tools Virtuality	.594**	.559**	1	
4 Perceived Overall Virtuality	.663**	.600**	.871**	1
N=256				

** p<=.01 (2-tailed).

The correlations were significant and at least moderately strong (=> .559) for all four perspectives on virtuality. The strongest correlation (.871) was between virtuality as perceived in terms of using technology and the overall rating.

Perceived success—descriptive analysis. In this study, three items were used to measure perceived success of the respondents' team. Respondents were asked to rate their perceived success on a 10-point scale where *1=strongly disagree and 10=strongly agree*. Mean ratings for each of these items were all close to 8.0. The standard deviation for the respondent's job satisfaction and relationship satisfaction rating were both over 2.0, indicating a wide range of responses around the mean (see Table 4.16).

Table 4.16

Mean Scores and Descriptive Statistics for Perceived Success in Goal Achievement and Job and Relationship Satisfaction

Variable	Mean	(SD)	Skewness	Kurtosis
Perceived Success in Goal Achievement My team achieves its' goals.	8.48	1.652	-1.736	4.007
Perceived Success in Job Satisfaction I am satisfied with my job.	7.91	2.048	-1.241	1.325
Perceived Success with Relationship Satisfaction I am satisfied with the relationships we have in our team.	7.86	2.031	-1.353	1.790

N=251

Summary of Research Question 1. There is not just one profile of a virtual worker; respondents represented a wide variety of demographics and industries and worked in a wide variety of virtual work environments. Analysis of the original, yet somewhat modified RHI and connectivity items by Carmeli et al. (2009), resulted in a new Relational Health Index for Teams at Work (RHI-TEAM$_W$), consisting of two components—Relational Health Authenticity (RHI-

A_W) and Relational Health Engagement/Empowerment (RHI-EE_W). Another outcome was the identification of potential measures of virtuality within work environments. Perception of three aspects of virtuality—geographic, interaction, and technological—as well as overall perception of virtuality provide a means for quantitative measurement of virtual worker environments.

Research Question 2

To obtain data on Research Question 2, How important is it to virtual workers to experience high-quality relationships in a virtual work environment and how does it align to their perception of relationship?—respondents were asked about the importance of and the degree to which they experienced high-quality relationships in their work environment. Respondents were asked to rate their level of agreement with the statements: (1) it is important to me to have high-quality relationships with my teammates and (2) I have high-quality relationships with my teammates. The same 6-point rating scale that was used for the RHI-$TEAM_W$ items where *1=strongly disagree and 6=strongly agree* was used for these questions.

In general, the responses for both variables were skewed toward agreeing that high-quality relationships were important and that they experience high-quality relationships within their teams. Ratings for the existence of high-quality relationships were generally lower than the ratings for the importance of high-quality relations (see Table 4.17). A high (84.7%) agreed or strongly agreed that high-quality relationships within their teams were important. A somewhat lower (68.7%) agreed or strongly agreed that they had high quality relationship within their team.

Table 4.17

Percent Distributions for Importance and Existence of High-quality Relationships

Item/Rating	Percentage
It is important to me to have high-quality relationships with my teammates (*M* =5.17, *SD* =.787)	
Strongly Disagree	0.0%
Disagree	0.8%
Somewhat Disagree	2.3%
Somewhat Agree	12.1%
Agree	48.8%
Strongly Agree	35.9%
I have high-quality relationships with my teammates (*M*=4.74, SD=1.094)	
Strongly Disagree	.8%
Disagree	5.9%
Somewhat Disagree	4.3%
Somewhat Agree	20.3%
Agree	45.3%
Strongly Agree	23.4%
N=256	

The mean scores, the mean score for importance was 5.17, or between agree and strongly agree, with a standard deviation of .787. The mean score for the existence of high-quality relationships within the team was 4.74, or between somewhat agree and somewhat agree, with a standard deviation of 1.094.

Subgroup analysis of perception for importance and existence of high-quality relationships. Initial review of the descriptive data showed that some subgroups had somewhat different perspectives on the importance and existence of high quality relationships within the team. Analysis of statistical significance for sub-group differences was conducted using independent samples t-tests for mean scores. The variables and the categories tested were: 1) respondent team position (team leader versus team member); 2) country/cultural background of

team members (same versus different); 3) respondent age in 2 groups (<= 50 years of age and over); and 4) respondent gender (male versus female). The mean scores are included in Table 4.18.

Table 4.18

Mean Scores for Importance of High-quality Relationships

Variable/Codes	N	Mean	(SD)
All Respondents	256	5.17	.787
Respondent Team Position			
Team Leader	100	5.28	.697
Team Member	156	5.10	.833
N=256			
Country/ Cultural Background of Team Members**			
Same	111	5.33	.623
Different	145	5.04	.873
N=256			
Respondent Age in 2 Groups			
Under 50 Years	137	5.20	.815
50 Years or Over	114	5.13	.747
N=251			
Respondent Gender			
Male	104	5.13	.746
Female	147	5.20	.810
N=251			

The difference in mean scores between the team leader (M=5.28) and team members (M=5.10) was 0.184, $t_{(1, 254)}$=1.833, p =0.068, or statistically significant at the exploratory research level of p<.10. The difference between mean scores for those from the same (M=5.33) versus different (M=5.04) country/ cultural background was 0.292, $t_{(1, 254)}$=2.988, p =0.003, a somewhat stronger level of significance than for the team leader versus team member analysis.

Differences between means for the other demographic and team characteristic variables (respondent age in 2 groups or respondent gender) were not statistically significant.

A similar review of the descriptive data for perceived existence of high-quality relationships for the same demographic and team variables also showed that some subgroups had somewhat different perspectives on the existence of high quality relationships within the team. Independent samples t-tests were again conducted to analyze the significance of sub-group differences across sub-groups for existence of high-quality relationships. The mean scores are included in Table 4.19.

Table 4.19

Mean Scores for Existence of High-quality Relationships

Variables/Codes	N	Mean	(SD)
All Respondents	256	4.74	1.094
Respondent Team Position***			
Team Leader	100	5.00	.876
Team Member	156	4.57	1.187
N=256			
Country/ Cultural Background of Team Members**			
Same	111	4.96	.981
Different	145	4.57	1.148
N=256			
Respondent Age in 2 Groups			
Under 50 Years	137	4.64	1.180
50 Years or Over	114	4.83	.986
N=251			
Respondent Gender			
Male	104	4.69	1.015
Female	147	4.76	1.156
N=251			

The difference in mean scores between the team leader (M=5.00) and team members (M=4.57) was 0.429, $t_{(1, 249)} = 3.323$, p =0.001. The difference between mean scores for those from the same (M=4.96) versus different (M=4.57) country/cultural background was 0.398, $t_{(1,254)} = 2.929$, p =0.003. The t-tests showed a statistically significant difference between team leaders and team members and those from the same versus a different country/cultural background for the perceived existence of high quality relationships within the team variable. The level of statistical significance for the differences between means for team leader and team member was stronger for perceived existence of than for the importance of high-quality relationships (p =0.001 versus p =0.068). The level of statistical significance for the differences between teams consisting of members from same versus different country/cultural backgrounds was the same strong p =0.003. Differences between means for the other demographic and team characteristic variables (respondent age in 2 groups or respondent gender) were not statistically significant.

The difference between individual respondent means scores for importance and existence of high-quality relationships was also explored. Dependent paired-samples t-tests were run to compare the two ratings from individual respondents. The same respondent and team demographics included in the independent t-tests were included in this analysis. They were: 1) Respondent Team Position (team leader versus team member); 2) Country/Cultural Background of Team Members (same versus different); 3) Respondent Age in 2 Groups (under 50 versus 50 years and older), and Respondent Gender (male versus female).

The difference in perceived importance versus the perceived existence was statistically significant at the p=.000 level for the overall population and all analyzed demographic and team characteristic subgroups. For the total sample, there was a difference in means scores of 0.430,

$t_{(1, 255)} = 7.323$, $p = 0.000$ The difference in mean scores for team leaders was 0.280, $t_{(1,99)} = 4.015$, $p = 0.000$ and for team members was 0.526, $t_{(1,155)} = 6.216$, $p = 0.000$. For those with the same country/cultural background, the difference was 0.369, $t_{(1,110)} = 4.259$, $p = 0.000$ and for different country cultural backgrounds it was 0.476, $t_{(1, 144)} = 5.981$, $p = 0.000$. For respondents who were under 50 years of age, the difference was 0.562, $t_{(1, 136)} = 6.399$, $p = 0.000$ and for those who were 50 years of age or older, the difference was 0.298, $t_{(1, 113)} = 3.939$, $p = 0.000$. The difference in mean scores for respondents who were female was 0.449, $t_{(1, 146)} = 5.675$, $p = 0.000$ and for those who were male was 0.433, $t_{(1, 103)} = 4.787$, $p = 0.000$. Table 4.20 provides the dependent t-test results.

Table 4.20

Dependent Sample Paired t-test Results—Importance versus Existence of High-quality Relationships

Variables/Codes	Results
Overall***	$t_{(1, 255)} = 7.323$
Respondent Team Position	
Team Leader***	$t_{(1,99)} = 4.015$
Team Member***	$t_{(1,155)} = 6.216$
Country/ Cultural Background of Team Members	
Same***	$t_{(1,110)} = 4.259$
Different***	$t_{(1, 144)} = 5.981$
Respondent Age in 2 Groups	
Under 50 Years***	$t_{(1, 136)} = 6.399$
50 Years or Over***	$t_{(1, 113)} = 3.939$
Respondent Gender	
Male***	$t_{(1, 103)} = 4.787$
Female***	$t_{(1, 146)} = 5.675$

*** $p <= 0.000$

In comparing the percentage of those respondents who agreed and strongly agreed to the importance and existence of high-quality relationships, the overall difference was 16.0%. The largest gap between importance and existence was for the under 50 years of age group (20.5%) followed closely by males (19.3%) and team members (19.2%). Table 4.21 provides the percentage agree and strongly agree to the rating questions on importance and existence of high-quality relationships.

Table 4.21

Percent Agree and Strongly Agree Importance and Existence of High-Quality Relationships

Variables/Codes	Importance %	Existence %
All Respondents	84.8%	68.8%
N=256		
Respondent Team Position		
Team Leader	90.0%	79.0%
Team Member	81.4%	62.2%
N=256		
Country/ Cultural Background of Team Members		
Same	91.9%	76.6%
Different	79.3%	62.8%
N=256		
Respondent Age in 2 Groups		
Under 50 Years	84.7%	64.2%
50 Years or Over	86.0%	73.7%
N=251		
Respondent Gender		
Male	83.7%	64.4%
Female	86.4%	71.4%
N=251		

Summary of Research Question 2. The purpose of Research Question 2 was to understand how important high-quality relationships are in virtual work environments and

whether virtual workers perceive that they experience high-quality relationships in the workplace. Respondents in this study clearly identify that high-quality relationships are important. Although it may be assumed that there would be differences across gender and/or age, that assumption was not supported by the results. This study found that there were statistically significant differences for the mean scores between perceived existence and importance of high-quality relationships for team position (team leader versus team member) and country/cultural background of team members (within the same or different country/ cultural backgrounds).

Dependent paired samples t-tests identified that there was a statistically significant difference for the mean scores between importance and existence of high quality relationships for all of the demographic and team characteristic variables tested. For most groups there was a difference between agree and strongly agree of between 11.0 and 20.5 percentage points.

The key finding of the analysis for Research Question 2 is that virtual workers think high-quality relationships are important but are less likely to experience them. And the gap is significant. This may not be a challenge in only the virtual work space. The importance of all individuals and organizations striving for high-quality relationships was emphasized by Jordan and Walker (2004). And the benefits of high-quality interpersonal relationships to building a learning organization were applicable to all (Carmeli et al., 2009).

Research Question 3

Research Question 3, What is the correlation between perception of relationship quality and relationship as measured by the Relational Health Indices and the Connectivity component?—was originally written to include all of the RHI items and the connectivity items. Hhowever the factor analysis performed as part of the analysis for Research Question 1

developed a new Relational Health Index within Teams at Work or RHI-TEAM$_W$. Analysis for Research Question 3 therefore used the components from the new index to understand the correlation between it and the perception of relationship quality.

Correlation analysis: RHI-TEAM$_W$ versus perception of existence of high-quality relationships. Pearson correlation was used to determine the correlation between the respondent's perception that high-quality relationships existed and the two RHI-TEAM$_W$ components of engagement/empowerment (RHI-EE$_W$) and authentic (RHI-A$_W$) for all respondents. Moderate to moderately high correlations between the perception question and the two RHI-TEAMs components were significant at the .01 level (2-tailed) for all respondents and all items (see Table 4.22).

Table 4.22

Pearson Correlation of the Perception of High-Quality Relationships, RHI-EE$_W$, and RHI-A$_W$ for All Respondents

Item	1	2	3
1 Perception High-Quality Relationships Exist	1		
2 RHI-EE$_W$ (Engagement/Empowerment)	.677**	1	
3 RHI-A$_W$ (Authentic)	.476**	.388**	1
N=256			

** p=< 0.01 level (2-tailed).

Summary of Research Question 3. Correlation exists between each of the three variables tested. The strongest correlation (.677) is between engagement/empowerment (RHI-EE$_W$) and the perception that high-quality relationships exist. This is followed by the correlation between authenticity (RHI-A$_w$) and the perception that high-quality relationships exist (.476). The smallest correlation (.388) is found between RHI-EE$_W$ and RHI-A$_W$. The moderate to moderately strong correlation between the perception of the existence of high-quality relationships and the two RHI-TEAM$_W$ components (RHI-EE$_W$ and RHI-A$_W$) indicated that the

two RHI-TEAM$_W$ components could be used to measure the existence of relationship in other statistical analysis.

Research Question 4

The overarching research question of this study was to understand what factors influence success in virtual work environments. The first three research questions and the literature review provided building blocks upon which this analysis was developed. In this study, perceived success was measured as achievement of team goals, job satisfaction, and relationship satisfaction. Three regressions were run—one for each of the three measures of success. Three categories of data were used in the regressions as independent measures: 1) respondent and team demographics, 2) virtuality profile, and 3) relationship.

Respondent or team demographics included: 1) Country/ Cultural Background of Team Members, 2) Respondent Team Position, 3) Respondent Team Tenure in 2 Groups, 4) Team Size in 2 Groups, 5) Industry in 2 Groups, 6) Respondent Gender, and 7) Respondent Age in 2 Groups. The virtuality measures included overall virtuality and Face-to-face Meeting frequency. Relationship measures included component composite scores for the two components of RHI-TEAM$_W$ (RHI-A$_W$ and RHI-EE$_W$) and the Perceived Importance of Relationship.

The category independent team demographic variables were coded into dummy variables as follows: Country/Cultural Background of Team Members with a code of 0 for different and 1 for same country/ cultural background; Respondent Team Position with a code of 0 for team member and 1 for team leader; Respondent Team Tenure in 2 Groups with a code of 0 for under 1 year and 1 for 1 year and over; Team Size in 2 Groups with a code of 0 for not large and 1 for large); and (5) Industry in 2 Groups with a code of 0 for those industries not Financial Services or Technology and 1 for Financial Services and Technology industries. Respondent

demographics were also coded into dummy variables as follows: Respondent Gender with a code of 0 for male and 1 for female and Respondent Age in 2 Groups with a code of 0 for under 50 years of age and 1 for 50 years of age and older.

Virtuality was included in the regression analysis with two variables: Perceived Overall Virtuality and Face-to-face Meeting Frequency. Perceived Overall Virtuality was measured on a 10-point rating scale, with *1=not at all virtual and 10=extremely virtual*. Face-to-face Meeting Frequency was a dummy variable that was coded with a 0 for those who never met face-to-face and 1 for those who met face-to-face.

Relationship was the third category of independent variables included in the regression. Relationship quality was measured using composite scores for the new RHI-TEAM$_W$ components (RHI-EE$_W$ and RHI-A$_W$) and the Perceived Importance of Relationship, measured on a 6-point rating scale asking the respondent to rate their level of agreement, with *1=strongly disagree and 6=strongly agree*.

Bivariate correlation of proposed independent variables. A bivariate correlation was used to ensure that all of the proposed independent variables could be used in the same regression model. A bivariate correlation value >0.80 suggests that the variables may be too highly correlated, indicating a possibility of multicolinearity. As there were no correlation values =>0.80, all 12 independent variables were included in the regression runs (see Table 4.23).

Table 4.23

Pearson Correlation of the Proposed Independent Variables

Variable			1	2	3	4	5	6	7	8	9	10	11	12
1	Country/ Cultural Background of Team Members	Correlation	1											
		Sig. (2-tailed)												
		N	256											
2	Respondent Team Position	Correlation	.107	1										
		Sig. (2-tailed)	.087											
		N	256	256										
3	Respondent Team Tenure in 2 Groups	Correlation	.029	.080	1									
		Sig. (2-tailed)	.646	.202										
		N	256	256	256									
4	Perceived Overall Virtuality	Correlation	-.118	.079	.094	1								
		Sig. (2-tailed)	.060	.205	.135									
		N	256	256	256	256								
5	$RHI\text{-}EE_w$	Correlation	.105	.235**	.096	.116	1							
		Sig. (2-tailed)	.093	.000	.125	.063								
		N	256	256	256	256	256							
6	$RHI\text{-}A_w$	Correlation	.110	.099	.045	.054	.388**	1						
		Sig. (2-tailed)	.079	.113	.478	.393	.000							
		N	256	256	256	256	256	256						
7	Perceived Importance of Relationship	Correlation	.184**	.114	.047	.025	.487**	.165**	1					
		Sig. (2-tailed)	.003	.068	.454	.689	.000	.008						
		N	256	256	256	256	256	256	256					
8	Respondent Gender	Correlation	-.023	-.040	.064	.059	.019	.090	.050	1				
		Sig. (2-tailed)	.715	.531	.310	.349	.771	.153	.432					
		N	251	251	251	251	251	251	251	251				
9	Respondent Age in 2 Groups	Correlation	.097	.024	.040	.000	-.015	.031	-.046	-.012	1			
		Sig. (2-tailed)	.124	.700	.529	.997	.809	.624	.465	.845				

Variable			1	2	3	4	5	6	7	8	9	10	11	12
		N	251	251	251	251	251	251	251	251	251			
10	Industry in 2 Groups	Correlation	.019	.072	-.067	-.109	.093	.122	.064	.068	.078	1		
		Sig. (2-tailed)	.757	.250	.282	.082	.137	.051	.304	.284	.217			
		N	256	256	256	256	256	256	256	251	251	256		
11	Face-to-face Meeting Frequency	Correlation	.130*	.044	.049	-.226**	.099	-.021	.102	-.107	-.090	.077	1	
		Sig. (2-tailed)	.038	.484	.435	.000	.114	.740	.104	.092	.156	.217		
		N	256	256	256	256	256	256	256	251	251	256	256	
12	Team Size in 2 Groups	Correlation	-.260**	.032	.061	.143*	-.025	.002	-.045	.084	.012	-.036	-.099	1
		Sig. (2-tailed)	.000	.610	.334	.022	.694	.969	.476	.183	.845	.562	.115	
		N	256	256	256	256	256	256	256	251	251	256	256	256

**p=< 0.01 (2-tailed)
* P=< 0.05 (2-tailed)

Linear regression analysis overview. Once the independent variables were confirmed, three linear regression analyses were run—one for each of the success measures. The stepwise method was selected for variable entry as it combines both forward and backward procedures and will remove any variables that lose some predictive validity when other variables enter into the regression. Three blocks of independent variables were used for all three executions of the linear regression analysis. Separate runs of the regression were performed for each of the perceived factors of success with the same independent variables (see Table 4.24).

Table 4.24

Model Regression with Identified Independent Dependent Variables

First Block – Demographics	Second Block – Virtuality	Third Block – Relationship
Country/ cultural Background of Team Members	Face-to-face Meeting Frequency	Perceived Importance of Relationship
Respondent Team Position	Perceived Overall Virtuality	RHI-EE_w
Respondent Team Tenure in 2 Groups		RHI-A_w
Respondent Gender		
Respondent Age in 2 Groups		
Industry in 2 Groups		
Team Size in 2 Groups		

The variables were entered using the stepwise method. The first regression block consisted of the seven dummy demographic and team variables. The second block consisted of two virtuality variables. The last block included the two composite scores for the RHI-$TEAM_W$ components and the Perceived Importance of Relationship rating. The dependent variables were perceived success at goal achievement, job satisfaction, and relationships, as measures on a

response scale of 1-10 where *1=strongly disagree and 10=strongly agree*. The perceived success statements were:

- My team achieves its goals.
- I am satisfied with my job.
- I am satisfied with the relationships we have in our team.

Perceived success in goal achievement. The first linear regression model examined the influence of the independent variables in the three blocks on the dependent variable of Perceived Success in Goal Achievement. The initial regression analysis using the stepwise enter process resulted in a statistically significant (R^2_{Adj}=.337, $F_{(5,245)}$=26.384, p=.000) model, with R^2 = .348, or accounting for about 35% of the variance in the dependent goal achievement variable. However, this included the independent variable, Respondent Team Position, which was not statistically significant in the final model. Thus, this regression, with goal achievement as the dependent variable, was rerun without the Respondent Team Position variable.

The regression runs for goal achievement without the Respondent Team Position variable resulted in four models. The first model contained Respondent Team Tenure in 2 Groups that contributed to 2.6% of the variance. The second model pulled in Perceived Overall Virtuality that contributed to 6.1% of the variance. The third model added RHI-EE_W and accounted for an additional 21.9% of the variance. The fourth model added the second relationship variable, RHI-A_W, accounting for an additional 4.3% of the variance. This statistically significant (R^2_{Adj}=.338, $F_{(4,246)}$=32.889, p=.000) model accounted for about 35% of the variance in the goal achievement dependent variable (see Table 4.25).

Table 4.25

Multiple Regression Analysis Explaining Perception of Success in Goal Achievement

Model	Explanatory Variable	R^2	R^2_{Adj}	DR^2	DF	p
1	Respondent Team Tenure in 2 Groups	.026	.022	.026	6.594	.011
2	Respondent Team Tenure in 2 Groups + Perceived Overall Virtuality	.087	.080	.061	16.614	.000
3	Respondent Team Tenure in 2 Groups + Perceived Overall Virtuality + $RHI\text{-}EE_W$	.306	.297	.219	77.849	.000
4	Respondent Team Tenure in 2 Groups + Perceived Overall Virtuality + $RHI\text{-}EE_W$ + $RHI\text{-}A_W$	.348	.338	.043	16.110	.000

Independent variables explaining perception of success in goal achievement in order by their standardized β coefficients were: $RHI\text{-}EE_W$ (β=.387), $RHI\text{-}A_W$ (β=.224), Perceived Overall Virtuality (β=.195), and Respondent Team Tenure in 2 Groups (β=.094). The two variables having the greatest effect on the goal achievement dependent variable were both relationship variables. $RHI\text{-}EE_W$ had the greatest effect, followed by $RHI\text{-}A_W$. The relationships of the independent variables to the dependent variable were all positive, indicating that higher relationship scores, higher perceived overall virtuality, and respondents who had been on their teams for over one year had higher perceived goal achievement scores (see Table 4.26).

Table 4.26

Regression Analysis Summary for Variables Explaining Perception of Success in Goal Achievement

Explanatory Variable	B	SE B	β	T	*p*
RHI-EE_W	.723	.105	.387	6.866	.000
RHI-A_W	.426	.106	.224	4.014	.000
Perceived Overall Virtuality	.183	.049	.195	3.750	.000
Respondent Team Tenure in 2 Groups	.344	.190	.094	1.809	.072

Note. R^2_{Adj}=.338 (n=251, *p*=.000).

These findings suggest that a positive view on relationships within the team, particularly in terms of engagement and empowerment, influenced the respondent's perception of success with goal achievement. Perceived Overall Virtuality, which was strongly correlated with the three subparts of virtuality (geographic, interaction, and technical tools), had the next largest effect and Respondent Team Tenure in 2 Groups was the smallest contributor to the Perceived Success in Goal Achievement variable. As scores on the engagement/empowerment RHI-EEw and the authentic RHI-Aw components increased, so did perception of success in goal achievement. Similarly, the higher the perception of the team's overall virtuality and the longer the respondent had been a member of the team, the higher the perception of success in the area of goal achievement.

Perceived success in job satisfaction. The second linear regression model examined the influence of the independent variables in the three blocks upon the dependent variable of Perceived Success in Job Satisfaction. Regression runs resulted in three models before the third and final model for the job satisfaction dependent variable. The first model contained Respondent Team Position that contributed to 5.2% of the variance. The second model added

RHI-EE_W and accounted for an additional 33.9% of the variance. The third and last model added the second relationship variable, RHI-A_W, which accounted for an additional 4.6% of the variance. The regression analysis using the stepwise enter process resulted in a statistically significant (R^2_{Adj}=.430, $F_{(3,247)}$=63.914, p=.000) model with R^2 = .437 or accounting for about 44% of the variance in the job satisfaction dependent variable (see Table 4.27).

Table 4.27

Multiple Regression Analysis Explaining Perception of Success in Job Satisfaction

Model	Explanatory Variable	R^2	R^2_{Adj}	ΔR^2	ΔF	p
1	Respondent Team Position	.052	.048	.052	13.608	.000
2	Respondent Team Position + RHI-EE_W	.391	.386	.339	137.831	.000
3	Respondent Team Position + RHI-EE_W + RHI-A_W	.437	.430	.046	20.397	.000

Independent variables having an effect on perception of successful job satisfaction, in order by their standardized β coefficients were: RHI-EE_W (β=.509), RHI-A_W (β=.234), and Respondent Team Position (β=.086). As was identified for the goal achievement dependent variable, the two independent variables having the greatest influence on the job satisfaction dependent variable were both relationship variables. RHI-EE_W had the greatest effect, followed by RHI-A_W. The relationships of the independent variables to the dependent variable were all positive, indicating that higher relationship scores and respondent team leaders led to higher perceived job satisfaction (see Table 4.28).

Table 4.28

Regression Analysis Summary for Variables Explaining Perception of Success in Job Satisfaction

Explanatory Variable	B	SE B	β	T	*p*
RHI-EE_W	1.179	.123	.509	9.596	.000
RHI-A_W	.551	.122	.234	4.516	.000
Respondent Team Position	.361	.206	.086	1.753	.081

Note. R^2_{Adj}=.430 (n=251, *p*=.000).

As was identified for the goal achievement dependent variable, these findings suggest that a positive view on relationships within the team positively influenced the respondent's perception of success with job satisfaction. Or a negative view on relationships negatively influenced the respondent's perception. The only other contributing variable to perceived job satisfaction was Respondent Team Position. Being the leader related to higher job satisfaction.

Perceived success with relationship satisfaction. The third and final linear regression model examined the influence of the independent variables in the three blocks of on the dependent variable of Perceived Success with Relationship Satisfaction. A regression analysis using the stepwise enter process resulted in a statistically significant (R^2_{Adj}=.555, $F_{(5,245)}$=63.472, *p*=.000) model with R^2 = .564, or accounting for about 56% of the variance in the dependent variable, relationship satisfaction. However, this included the independent variable, Respondent Team Position, which was not statistically significant. Thus, this regression, with relationship satisfaction as the dependent variable, was rerun without the Respondent Team Position variable.

The regression runs for relationship satisfaction without the Respondent Team Position variable resulted in four models. The first model contained Respondent Team Tenure in 2 Groups that contributed to 4.5% of the variance. The second model pulled in Perceived Overall

Virtuality that contributed to 2.5% of the variance. The third model added RHI-EE_W and accounted for an additional 43.2% of the variance. The fourth model added the second relationship variable, RHI-A_W, accounting for an additional 5.9% of the variance. This statistically significant (R^2_{Adj}=.553, $F_{(4,246)}$=78.291, p=.000) model accounted for about 56% of the variance in the relationship satisfaction dependent variable (see Table 4.29).

Table 4.29

Multiple Regression Analysis Explaining Perception of Success with Relationship Satisfaction

Model	Explanatory Variable	R^2	R^2_{Adj}	ΔR^2	ΔF	p
1	Respondent Team Tenure in 2 Groups	.045	.041	.045	11.617	.001
2	Respondent Team Tenure in 2 Groups + Perceived Overall Virtuality	.069	.062	.025	6.591	.000
3	Respondent Team Tenure in 2 Groups + Perceived Overall Virtuality + RHI-EE_W	.501	.495	.432	213.647	.000
4	Respondent Team Tenure in 2 Groups + Perceived Overall Virtuality + RHI-EE_W + RHI-A_W	.560	.553	.059	33.043	.000

Independent variables explaining perception of success in relationship satisfaction in order by their standardized β coefficients were: RHI-EE_W (β=.563), RHI-A_W (β=.264), Respondent Team Tenure in 2 Groups (β=.136), and Perceived Overall Virtuality (β=.083). Not surprisingly, relationship variables had the greatest effect on perception of success with relationship, with length of time the respondent had been on the team adding an additional small influence. The RHI-EE_W engagement/empowerment variable had the greatest effect followed by the RHI-A_W authentic variable. The relationships of the independent variables to the dependent variable were all positive, indicating that higher relationship scores, respondents who had been on their teams for over one year, and higher perceived virtuality had higher relationship

satisfaction scores. Perceived Overall Virtuality was strongly correlated with geographic, interaction, and technical tools virtuality. The correlation between overall and technical tools virtuality was the strongest (see Table 4.30).

Table 4.30

Regression Analysis Summary for Variables Explaining Perception of Success with Relationship Satisfaction

Explanatory Variable	B	SE B	β	t	*p*
RHI-EE_W	1.293	.106	.563	12.162	.000
RHI-A_W	.616	.107	.264	5.748	.000
Respondent Team Tenure in 2 Groups	.611	.192	.136	3.181	.002
Perceived Overall Virtuality	.096	.049	.083	1.953	.052

Note. R^2_{Adj}=.553 (n=251, *p*=.000).

These findings emulated what was discovered for the prior two dependent variables (perceived goal achievement and job satisfaction). These results suggest that a positive view on relationships within the team, particularly in terms of engagement and empowerment, influenced the respondent's perception of success with relationship satisfaction. Respondent Team Tenure in 2 Groups had the next largest effect and Perceived Overall Virtuality was the smallest contributor to the Perceived Success with Relationship Satisfaction variable. The longer the respondent had been a member of the team positively influenced the respondent's perception of success with relationship satisfaction. The higher the level of overall virtuality perceived by the respondent also positively influenced the respondent's perception of success with relationship satisfaction. A summary of the final results of the regression analysis is available in Table 4.31.

Table 4.31

Regression Analysis Summary Explaining Perception of Perceived Success

Dependent Variable	Independent Variables	R^2_{Adj}	F	β	*p*
Goal Achievement (Excluding Respondent Team Position)		.338	32.889 (4, 246) p=.000		
	Respondent Team Tenure in 2 Groups			.094	.072
	Overall Virtuality			.195	.000
	RHI-EE_W			.387	.000
	RHI-A_W			.224	.000
Job Satisfaction (Retaining Respondent Team Position)		.430	63.914 (3,247), p=.000		
	Respondent Team Position			.086	.081
	RHI-EE_W			.509	.000
	RHI-A_W			.234	.000
Relationship Satisfaction (Excluding Respondent Team Position)		.553	78.291 (4, 246) p=.000		
	Respondent Team Tenure in 2 Groups			.136	.002
	Overall Virtuality			.083	.052
	RHI-EE_W			.563	.000
	RHI-A_W			.264	.000

Summary of Research Question 4. A major outcome from the analysis of Research Question 4 was the identification of relationship variables as the most influential factor for all three perceived success variables. Engagement and Empowerment (RHI-EE_W) had the greatest effect, followed by Authenticity (RHI-A_W). Perceived Overall Virtuality and Respondent Team Tenure in 2 Groups also had a small influence on perceived goal achievement and relationship satisfaction. Respondent Team Position had a small influence on perceived job satisfaction. In all cases the relationships of the independent variables to the dependent variable were positive.

Research Question 5

What suggestions do virtual workers have for building and maintaining high-quality relationships or to improve productivity? Commentary on this question was provided in two main areas—relationships and productivity in a virtual working environment. Questions regarding relationship requested that participants reflect upon both exemplary practices as well as what makes it difficult to have high-quality relationships. Productivity suggestions included things that respondents currently leverage within their teams as well as commentary on how to improve their current working environment. The four questions were:

- What examples can you provide of things you or your teammates have done to build or maintain high-quality relationships within the team?
- What makes it difficult to have high-quality relationships within the team?
- What routines does your team use to stay connected?
- Do you have any suggestions that would make you more productive working virtually?

Participants were very generous with their comments and suggestions. Of the 256 respondents, 244 spent the extra time to provide thoughtful and provoking commentary. In total the

commentary accounted for 37 single-spaced pages. A thematic review of the commentary identified both the tactical and interpersonal areas, including: team structure and processes; technology tools; in person interaction; personal knowing and trust; cultural inclusion; and sustainment and balance.

Simple grammatical changes were made to the qualitative narrative responses to make the responses clearer to the reader. The detailed discussion of each of the themes will begin with a review of team structure and processes.

Team structure and processes. Consistency of team meetings was the number one suggestion with 60% of the respondents emphasizing the need for regularly scheduled meetings. Frequency varied from daily, weekly, bi-weekly, monthly, quarterly, and yearly; however, the importance of a schedule was emphasized. One respondent indicated that adherence to a "strict meeting schedule (meetings occur even if there is not necessarily a reason to meet)" was important. The meetings served to "keep everyone informed of business developments and to share issues or accomplishments" or, as one respondent mentioned, provides "updates across the virtual horn."

It was important that meetings were more interactive in nature and included "proactive communications, consensus gaining, [and] soliciting feedback." Several respondents provided suggestions on how to keep others involved in meeting management, suggesting that "routine team meetings with rotating meeting host (team members NOT the leader)...help us get to know each other." Respondents also noted that the agenda of meeting was important, suggesting that meetings should "include conversation topics that are personal in nature, give everyone an opportunity to have their voice be heard by doing a roll-call before decisions are made and a 'round table' at the end of the meeting for any additional items anyone wants to bring up." This

was especially important for those who work remotely from the majority of their teammates. Those respondents expressed a lack of connection from those in the main office. Many felt as if they were on the outside of the center of communications.

Clearly defined roles/responsibilities and effective collaboration among teammates was highlighted by respondents, one of whom cited the need to "ensure team management pushes down strategy, vision, and goals." One respondent reflected on the benefit of a team being dedicated to the overall goals. S/he indicated that it "unites us and moves us to the task at hand." S/he also emphasized personal accountability and the importance of "maintaining goals/objectives by individual to measure against." Disruptive managers who are ineffective in managing team resources were specifically mentioned by nine respondents. One respondent expressed discontent at the manager's failure to manage accountability effectively when s/he shared that the reason the team does not have high-quality relationships was due to the

> Lack of accountability on part of [the] manager: Manager not taking responsibility. No clear strategy, instead tactical reactions to daily problems (fire-fighter syndrome). Continual blame-laying, finger pointing. I feel thrown under the bus often, that is, I take the fall when manager wants to hide his incompetence or when he tries to look good. This person keeps the limelight for himself, does not promote others. Not approachable. Instead, he grumbles and gripes about the work.

Business processes were also identified as needing improvement. All workers require good business processes to perform. "Virtual doesn't mean 'loose.'" Change is inevitable—especially changes to organization structure. In the event organizational changes are made it is important that announcements are sent to all involved concurrently. Some respondents indicated that there seemed to be a lot of change in their worlds. "Constant turnover/ reorgs of teams and short-term project focus—'once and done' doesn't lead to desire to sustain relationships." If the change is unavoidable, perhaps sharing the rationale for the change might assist in the understanding.

Three respondents emphasized that lack of structure was a significant problem within their teams. When asked to provide examples of routines, one respondent shared that they have "very few at present—it is a problem." Another shared that their team was primarily focused on job tasks by indicating that they "have none! Only a project plan which has been reduced to phases."

Lastly, the importance of levity was emphasized by two respondents who shared how effective it is to "interject some levity and personal things in interactions... not always just all business." The tone of meetings and interactions is usually set from the top. One self-identified leader understood and relayed that "as a leader, I try to be very efficient w/our meeting agenda/discussion but also lighten things up every once in a while with a bit of joking and laughter."

Team structure and processes appeared to be important to virtual workers. Technological advances have provided tools to facilitate communications; however, there exist some gaps in tool usage and expertise.

Technology tools. Email was mentioned in the narrative responses by 37% of those surveyed as being a very important tool. Online chat or text messaging (27%), telephone calls (26%), and conference calls (26%) were next in frequency. It has been said that there is a time and place for everything. The same could be said about the use of methods to communicate. As one respondent shared:

> Routines vary according to the seasonal nature of the business. During heavy work times, weekly meetings—outliers connecting via phone—keep everyone up to date. Instant Messaging for quick questions, email for more complex things needing documentation, and phone calls for the stuff that would take too long to explain otherwise.

Instant messaging was highlighted as a tool that supports informal discussions. One respondent noted that:

> People take time outside of meetings to check in with each other and share some personal thoughts and insights. People use back channel conversations (like instant messaging) to help each other to be more effective in meetings (e.g., by suggesting key words, giving warnings).

The informal nature of instant messaging or chat was highlighted as a benefit. Some use it for "general social conversation, i.e., the weather; weekend plans; vacation plans; commute times to and from work, little things like that."

The ability to conduct effective audio conference calls was mentioned as a gap. Dissatisfaction when calls consisted of a mixture of those in person in a conference room using a speaker phone while others were remote was highlighted. One respondent mentioned a possible best practice—the entire team participated in conference calls using a headset so all are on an equal playing field. Also mentioned as important during conference calls was "speaking clearly and not having side conversations."

Commentary regarding the use of video represented a broad spectrum of thoughts and opinions. Many respondents emphasized the benefits of video:

> Use of video for team calls to ensure that the team "sees" each other on a regular basis—encourages a different level of engagement and involvement than audio only calls.

> We have had team meetings, added the benefits of Google Hangout and chat to our regular communication so that we are able to see each other making it easier to build honest relationships based on evaluation of facial and body queues.

> Our inter actions are in American Sign Language we make good use of Text messaging, e-mail, Video Relay, Video phones, Skype and other devices that allow for visual communication.

One respondent observed that s/he found Telepresence rooms to be "as good as face-to-face because you can see expressions and people can't get away with multitasking." S/he observed

that multitasking is "the big blocker to virtual teams" and one ends up "sitting in meetings where many of the participants are checked out." Whatever tool(s) are available, virtual workers should "learn to use technology tools that will help you stay connected" and "make sure your presence is recognized in meetings by participating," as well as "stay focused while in meetings by not multi-tasking too much."

There were, however, those on the other side of the fence who do not see video as value-added, viewing it only as "unnecessary overhead." One respondent shared "we have more Telepresence meetings now with the whole team but it still doesn't feel like everyone is together because not all participants can be seen at one time or have access to a TP site." A need for "more video [was expressed by one respondent], but teammates are uncomfortable with video." The opposing view of one respondent was very clearly stated: s/he indicated that "we all hate video conferencing." It's a dilemma. Some reflected on the complexity of using video. Some of the difference of opinion was due to variations in the type of video used. A number of respondents referenced more formal video capability as opposed to webcam or Skype.

Internet connection speed was a common thread within the comments. When asked about improving productivity, a number of participants mentioned the need for larger or dual monitors. They also noted the need for better technology and collaborative tools such as white boarding, screen sharing, use of tablets, Go To Meeting, Google Tools, SharePoint, and Lync.

Key to using technology is the knowledge of how to use the tools. And the gap in the level of expertise is clearly a challenge for virtual teams. One respondent mentioned that "there are several people within the team who do not have a high level of technology skills. Some of our team time is working on helping those team members to come up to speed or know how to use new virtual tools." And s/he reflected that "we may need to take turns in who is teaching

who, based upon the needed patience to work with the less skilled team members." Generally, all workers need the tools to appropriately do their jobs—not just virtual workers. Consistent technology support was mentioned as an issue by a number of respondents—especially those who worked remotely from headquarters. Not having technology support available was highlighted by one respondent who reflected that "working virtually would be better if everyone had the same equipment and someone at their location who can handle IT issues. Often times it seems that we have to be on a call with an IT department person who handles the issue remotely. It gets frustrating." Technology tools are important; however, the following observations tended to diminish such prioritizations of technology:

> I think the successful is made by the people on the team not the tools available.
>
> The biggest piece of the virtual teaming issues is the culture set by the organization…. You can have a very tight team that only uses the phone and email. Or you can have a not-so-tight team that uses all the tools available to them…. It really comes down to business climate, culture in an organization and the management chain under which you work.
>
> My research shows: working virtual is more about process then knowledge worker (people) and finally technology.

Technology has improved the ability to communicate across virtual bounds; however, as one respondent observed, "nothing replaces face to face. You can use the technology to sustain the relationships, but at some point the team has to be face to face."

In person interaction. The most frequently mentioned challenge to developing and maintaining high-quality relationships was the lack of face-to-face time. The inability to catch nonverbal clues sometimes causes misunderstandings. And the lack of informal "water cooler" time means less interaction among teammates. The following reflections regarding the impact of the lack of in person interaction provide some key points expressed by numerous respondents:

> Collaboration technology is not up to the task for certain complex meetings, especially ideation, whiteboard sessions, and when participants do not have a common mother tongue. We still rely partially on face-to-face meetings where we physically come together, especially for kicking off major initiatives, team building, and certain types of ideation (especially extremely complex topics).
>
> Technology limits the human side of the relationship. There are things you would do if you were there live: like take them to lunch or take the team member and spouse to dinner, just in time coaching. There is something to be said about face to face encounters that technology just sterilizes.

Geographic and monetary restraints may limit the amount of face-to-face interaction; however, it appears that the benefits outweigh the up-front costs and would positively impact productivity. Twenty-five respondents emphasized meeting face-to-face in their commentary about virtual productivity. It was recommended to "have a face to face EARLY ON—let folks meet, put faces to names, have some interactions outside of the workplace." This preliminary meeting "helps set up the initial connections that make every interaction after add to the building of trust." A second face-to-face session was also recommended "within 3 months to solidify. After that… [the] team can easily work virtually for years." One respondent indicated that the type of work that is being done should be assessed to determine how much face-to-face time was required. S/he indicated that "if you are in a collaborative type of work, the time spent working virtually should be limited to a smaller percentage of the overall time, perhaps 10-25% of the time as opposed to greater than 90% which was the case for me."

A common thread within this section of commentary was the need to meet face-to-face, even if only infrequently; however, there were those who had never met some with whom they work and yet found ways to develop bonds across geographical distance.

Personal knowing and trust. Earlier in this chapter I shared how highly respondents agreed that high-quality relationships were important. High-quality relationships can be developed by going beyond just the day-to-day tasks of the job. Put another way, there is a

strong need to become "involved with each other interpersonally rather than purely transactionally." This seemed to be a common thread among respondents as the suggestions to improve personal knowing or bonding were proliferous.

Recognition and appreciation were both cited as being important. Recognition expands beyond the scope of the job, in that it includes "achievements and personal milestones (anniversary, birthday)." Recognition was mentioned as a formal part of meeting agendas. In addition, one respondent mentioned "we all are careful to remember to be grateful and complimentary of each other. 'Thank you' is used liberally." Recognizing the contributions of teammates was cited as an important part of building connections.

Personal knowing takes time. Establishing personal relationships does take time and effort. The participant pool included 64.5% who were on teams that had been in existence for more than two years and 52.7% of the respondents had been members of their team for over two years. The longevity of the teams' existence and duration of team membership possibly had a positive impact on the building of intra-team relationships. Two of the respondents indicated that they had known each other from prior relationships and had met face-to-face. Other means of getting to know teammates included:

> I travel to the location of the team as often as I can. We also try to spend some time talking about non-work things during our calls to personalize our relationship.
>
> We work to develop a culture where we reach out to each other daily to build and strengthen relationships, which fosters open dialogue and openness to new ideas.
>
> We have a regular "check in" re: our personal lives at the beginning of each meeting as well as regular phone and email contact.

The use of social media was emphasized, as is exhibited by one respondent's response. "Being Facebook friends help us feel part of each other's lives (example—you can ask about their new puppy or their vacation because you have seen pictures!)."

Another means for enhancing personal knowing was mentioned by a number of respondents. It could be called crosspollination of teammates.

> My manager also teams us on projects and rotates the teams around, that helps us get to know each other better.
>
> Cross-training when we have the opportunity to be together (although it works virtually).
>
> We leverage shared projects as opportunities to strengthen our sense of partnership and "shared life."

Many teams have built what could be called a safe space for enabling growth, as is evident from the following commentary:

> I engage some teammates regularly for feedback.
>
> We acknowledge each other's strengths and weaknesses.
>
> We also acknowledge each other's strengths and weaknesses.

Collaboration and sharing of information was a common thread in the commentary. As one respondent indicated, "creating a Community of Practice (COP) meeting for teammates to just talk about successes and challenges helps strengthen ties to each other." Idea generation and growth appear to be outcomes from the sharing.

> We support each other. There is a lot of intra-team sharing of experience and true caring. The mantra is to teach and learn every day.
>
> The team is very caring and helpful to each other. They are quick to jump in and help when a co-worker needs assistance in anything (personal or professional).
>
> We study content on-line at an individual pace, but share questions, surprises, progress, projects, and products with one another and our team leaders regularly. Every project posted requires that we ask a question, and try to respond to someone else's question. It makes you realize we are all Learners in this process.

The possible impact of the lack of an interpersonal relationship with teammates may be seen in this respondent's reflection.

> I do not believe there are "high-quality" relationships within our team—we all seem to get on with our daily routines and speak to each other periodically. I have a good relationship with a couple of members of the team, but that has been because of effort I have put in to same rather than anything else. In many ways, thinking about this—it is sad.

One respondent specifically shared a somewhat different view about the importance of high-quality relationships.

> I don't think there's any real difficulty. I will say that I don't think any of us derives a sense of self-worth, or define our identities by virtue of this team environment. We're all highly skilled, highly educated, highly motivated individuals, so we don't look to each other to provide emotional support or basic affirmation that we're important or respected.

The element of humaneness and trust is a challenge for all workers. Not just those working virtually. One respondent remarked that "the problems we have are simple human problems. Sometimes it is crazy deadlines or occasionally a difficult personality. Few of these things have a technological solution." Much has been written about the importance and elusiveness of trust. "Trusting in others to do what they say they are going to do is critical in a virtual relationship."

The idea that conflict does arise was apparent through the commentary. One respondent emphasized the importance of trust and openness. "We are open with each other and able to speak the truth for us, even if we are upset, without negative results. This is very helpful since we are virtual." Another highlighted that they were "willing to set aside personal differences to talk through issues, separating people from tasks/behaviors." One team has "actively set up processes for recognizing and dealing with conflict, and increasing the level of intimacy and belonging."

Respondents expressed acknowledgement that it takes time to build trust within a team. "Being 100% virtual is very tenuous on mental capacity. You have to have new ways to build trust and relationships." Most comments in this area indicated that "trustworthy execution and

good track record" was required. And there was appreciation of the other teammates exhibited by the comment "trusting and teamwork are part of our core values and although we are competitive, it is not a back stabbing environment—we enjoy learning from each other."

While trust was listed as an important part of a well-functioning team, "Distance; personality differences; organizational mistrust" were highlighted as challenges. One respondent reflected that they "have shared values that are overtly named and supported by all." Clearly those with the same values and personalities tend to work together well, however, not all teams are composed as such. And the value of diversity is sometimes not understood. Granted, not all difference is an inclusion issue; however, there exists a fine line. It is difficult when styles and values are not shared amongst all team members. Personality conflicts and the lack of making an attempt to understand differences of opinion seem to be widespread. Numerous negative comments concerning both teammates and managers expressed concern about those who impacted their ability to perform and their satisfaction with their work environment.

> Egos, Career Climbing, Power struggles.
>
> Lack of attention or desire to understand beyond the self.
>
> Some team members are unable to shift their focus from their own goals to team goals. In other words they are not team players, and may even be disruptive to team performance.

The impact of an overly competitive business environment may also be seen in the commentary provided.

> There is unhealthy competition in which individuals attempt to shine instead of a team effort to make the team's brilliance first. Relationships are strained because of personalities, not differences in geography or the ability to connect through technology.
>
> The overall business environment we are in is highly competitive. As an example, two colleagues may be slow to help or engage one another when placed in a position where only one of them can be rewarded.

Working in a virtual work environment may provide more of an opportunity to partner with those from different time zones and country/cultural backgrounds. Carrying those core values of personal knowing and trust across to cultural inclusion was another theme of the commentary.

Cultural inclusion. Cultural inclusion and time zone awareness was a common theme in the feedback. Some respondents also made reference to generation gaps with respect to technology. "In today's work environment you have a diverse work force from an age perspective. Cultures of the older work force are different than younger generation. Culture plays a large role in how well technology improves productivity and how well virtual teams work." Another respondent commented, "People need to understand that virtual means something different to those with different demographics on teams. Make sure that each frame of reference is considered when building virtual networks." Another suggested the benefit of "having a common cross-cultural training." Respondents shared that virtual workers should "celebrate virtually, and appreciate the different geo's individuals are from." And "try to share knowledge across the broader team, in order for the team to understand what is going on in our world." Some referred to language differences and some discussed the gender differences in some cultures. A lack of openness and understanding was presented.

> Cultural differences are challenging, but exciting for me personally to learn about at the same time. Not all team members are open to different cultures, however.
>
> I am a U.S. lead and there are also "off shore" leads that are my peers. There is a greater sense of hierarchy in India and Vietnam workers and so it is difficult for me to form relationships with the direct reports of my peers. Also non-U.S. women need to be given extra space to speak up and this takes time to foster trusting relationships mediated only through phone, web meeting, and instant message. We do not use video conferences fyi although I don't think that would make a difference.

Teams are working across time zones-globally. It appears that acknowledgement and planning is still being done in some organizations without awareness of time zone differences. Specific rules of engagement were suggested, including identifying "time windows when we work and do not contact each other" and the need to "set aside regular times for phone or Skype conferencing" and "alternating meeting times that are during off hours for one or another team member." Working across time zones was identified as a barrier to building relationships.

> Time zones impact when you can speak with others. Although effective, video cannot replace f2f interactions for brainstorming. Technology break downs impact ability to communicate on occasion.
>
> Dealing with people in another country makes it difficult to form a working relationship. You do not see them on a day-to-day basis. When you do connect with them it is to handle the tasks at hand. Team building is difficult.

The final theme identified in this study was in the area of sustainment and balance for virtual workers.

Sustainment and balance. The common themes of information overload, demands of the job, and time management were also mentioned. Focusing on getting the job done and competitiveness in the workplace inhibited establishing and maintaining high-quality relationships. Respondents acknowledged that this is a problem for both virtual and in person teams. "We usually are on about 8 hours of calls per day to hash things out. THEN the actual work can begin." And "I currently have almost 900 emails. So that is the biggest issue the volume of emails is killing me." In the age of technology and the 24-hour clock, the accessibility benefits of working remotely may for some become an issue. As one respondent indicated, "virtual interactions are demanding. When one works from home, they don't have the distractions of the office workplace, so they tend to work all the time. This can cause burn out if not balanced."

> The intense pressure of the work to be done. There is little time for building relationships outside of meetings. Limited resources (staffing) to complete the work. The subject matter experts have limited time to provide additional knowledge to others.
>
> Time: time zones, the number of hours in a day, the tyranny of deadlines and schedules, the need to protect time for my family and non-work friends, and for myself.

Respondents reflected that it is very easy to become isolated in a virtual environment and there is perhaps a tendency for those who are working remotely to become "out of sight, out of mind." Isolation was described by one respondent who said "we don't stay connected as a team. We work only individually with us and our immediate boss or supervisor." Another shared the impact to the connections she felt with her team:

> Lack of face time. I have been working on virtual teams for over 6 years now, and I've noticed I lose my sense of belonging to the team after a while. I think this mainly has to do with the fact that we've been so focused on multiple projects without the occasional get-together. It is very taxing after a while.

One respondent suggested as a creative way to handle the sometimes mentioned isolation of virtual workers. "Sometimes it gets lonely at home in your virtual office all day by yourself—so get a dog to keep you company—I'm serious. Just make sure it doesn't bark during conference calls." Another indicated that "after years of doing this, you do start to feel disconnected, so having the occasional meeting in an odd place like a coffee shop to collaborate with a teammate, would be a good idea, assuming geographically accessible." One virtual worker who works with teammates across the United States for a large organization "Organize[s] a lunch monthly for all of the virtuals in my area (although we don't work together)—it is a great way to stay connected." Another indicated that they "have a virtual group across our company" and they "provide support and networking to all who wish to participate."

Summary of Research Question 5. The robust commentary provided by the survey respondents yielded a wealth of information surround the building and maintaining of high-quality relationships as well as those barriers virtual workers experience

The common themes of team structure and process; technology tools; in person interaction; personal knowing and trust; cultural inclusion; and sustainment and balance served to organize the feedback and bring together thoughts and recommendations for those who work virtually. The following two quotations provide an overarching view of what virtual workers have found that work for them.

> High-quality relationships have been maintained because of common professional and personal interests; professional and personal communication through email, phone conversations, webinars, face-to-face gatherings and spiritual connection through prayer. Trust is an integral component of any relationship especially a high-quality one.

> I have worked in corporate environments for 30 years, but only the last 2 in a virtual team. Wish it had happened sooner. Feels like I have reclaimed my life. Probably work harder, maybe even longer, and am exponentially more productive as compared to my "cubicle" days. But still seem to be able to spend more time with family, or other personal activities. My best comparison would be to the majority of my extended family who are self-employed or run their own businesses. Work never stops for them, but neither does their ability to schedule personal activities. It all blends and just becomes life—not work life and home life separately.

Conclusions

Chapter IV presented the results of this research study in the context of the dynamic and broad profile of virtual workers. The research indicated how important it was to virtual workers to have high-quality relationships and provided data on the degree they experience them in their work environment. I noted the correlation between the perception of relationship quality and relationship as measured by the new RHI-TEAM$_W$ components and provided a review of the factors that impact perceived success. Finally, an examination of the abundant commentary

provided suggestions and thought provoking information about aspects surrounding high-quality relationships and productivity.

Once data for the individual research questions were analyzed, an integrative analysis was performed to pull together the findings from this research study. The integrative analysis is presented in Chapter V and includes an overview of the findings, the unique contributions of this study, and implications for leadership and change, as well as limitations of this study and suggestions for future research. The final chapter of this dissertation will discuss the unique contributions of this research, including theoretical and practical consequences of the results. Implications for leadership and change will be included. It will also identify the limitations of the study and recommend future research possibilities.

Chapter V: Discussion

The purpose of this study was to understand the nature and influence of relationship on perceived success in a virtual work environment. Success was defined as perceived team goal achievement, job satisfaction, and satisfaction with relationships.

Review of the Study

Establishing a foundation of knowledge in two major bodies of literature was paramount to effectively direct the design of the study. I thus performed a detailed review of prior research and the body of knowledge surrounding virtual work teams and relationship. In particular, the concept of the virtual continuum, as introduced by Zigurs in 2003, was referenced to emphasize the diverse work pattern behaviors in the virtual environment. Numerous challenges associated with working in a virtual work environment have been identified in the area of communications (C. B. Gibson & Cohen, 2003), team structure (Ryan, 2010), technology tools (Lipnak & Stamps, 1999), trust and personal knowing (Kayworth & Leidner, 2001), and cultural inclusion (Mitchell & Zigurs, 2009). This study captured data in those areas to increase the understanding of the current virtual work environment. Trust and personal knowing were identified as challenges prevalent in virtual work teams in the qualitative narrative. Relationship literature incorporated the importance of high-quality relationships at work (Carmeli et al., 2009; Fletcher, 1999). To more deeply understand the role of relationship in the virtual teams, RCT was explored as a potential foundational construct for operationalizing the qualities of virtual team connections. RCT espouses the "five good things" of: 1) empowerment, 2) enablement, 3) clarity, 4) sense of purpose and self-worth, and 5) desire for more connection. RCT emphasizes that when the five good things are experienced, positive outcomes ensue, including: 1) good conflict, 2) power as shared, 3) mutuality, 4) fluid energy, 5) creativity, and 6) productivity.

Clearly the positive outcomes from high-quality relationships would be advantageous in the world of work. The measurement of these qualities was first accomplished by Liang et al. (2002), who developed the RHI. The three components of RHI tie directly to the five good things embraced by RCT: engagement, empowerment, and authenticity. The development of a modified version of the RHI, incorporating some adjusted connectivity items by Carmeli et al. (2009), became the underpinning for measuring relationship within this study.

The research study was designed to incorporate the knowledge of good relationships at work and its measurement to the virtual team environment. The overall research design consisted of a mixed-methods (descriptive, correlational, and hierarchical multiple regression) study. A survey instrument was developed and delivered via the online survey tool, SurveyMonkey®. Invitations to participate were posted on LinkedIn and distributed via a business card in multiple venues. Qualitative data was collected within the survey for thematic analysis to further the understanding of participants' experiences of relationship in virtual teams.

Five primary categories of measurement were used in this study to provide a unique view into virtual work environments and relationships: 1) respondent and team demographics, 2) relationship measures, 3) virtuality profile, 4) success measures, and 5) qualitative narrative.

Demographics—both team and respondent—facilitated analysis of different populations. Team demographics included the size of the team, how long the team had been in existence, the country/cultural background of the team members, the tenure of the respondent on the team, the position the respondent held on the team, and the industry represented by the team. Respondent demographics included the individual's age and gender.

The second category of measurement focused on relationships. The RHI was first introduced to researchers in 2002 (Liang et al., 2002) as a means to measure relationship quality.

An adaptation of the RHI, RHI-TEAM$_{W,}$ was developed to measure relationship qualities among virtual team members. The perceived existence of high-quality relationships was measured to provide an overall assessment of the respondents' relationship on the team. One additional dynamic of relationship was measured to understand how important high-quality relationships were to virtual workers. All of the relationship measures used a 6-point scale with choices ranging from *1=strongly disagree to 6=strongly agree*.

Virtuality profile measures were the third category of data. A wide variety of data surrounding virtual work environments was acquired in the survey including primary work locations, in-person meeting frequency, technology tool usage, and expertise with specific tools. Perceived overall virtuality and subparts of geographic, interaction, and technology tools virtuality were also rated by respondents. The perception of virtuality measures used a 10-point scale with choices ranging from *1=not at all virtual to 10=extremely virtual*.

The fourth category of data collected for this study included success measures. The determination of what factors contribute to the success of virtual teams required measurement of success. This study asked respondents to judge success on three factors: 1) perceived team goal achievement, 2) job satisfaction, and 3) satisfaction with the team relationships.

The last category of data was in the form of qualitative narrative. Insight was obtained from the participants to add to the interpretation of quantitative data and included commentary on relationships and how to improve productivity.

This final chapter will discuss key findings, address the limitations of the study design, and note the implications for future research and practice in virtual workplace teams.

Key Findings of This Study

It is important at this juncture to consider the key findings in relation to existing literature in the field. Thus evaluating what this study has revealed about the role of relationship in virtual teams to perceived success. For the purposes of this discussion the findings have been grouped into five major areas: 1) the role of relationship in virtual teams, 2) adaption of the RHI to virtual work team environments, 3) demographic difference in relationship, 4) the importance versus existence of high-quality relationships, and 5) the components of virtuality.

The role of relationship in virtual teams. The primary research question for this study was "What is the nature and influence of relationship on success in a virtual work environment?" Perceived success was measured as achievement of team goals, job satisfaction, and relationship satisfaction. Separate regressions were run for each perception of success measures to determine which factors were most influential. The RHI-EE_W (engagement/empowerment) and the RHI-A_W (authenticity) component scores were the most influential variables on the respondents' perception of success—for all three success measures. The RHI-EE_W was the most influential factor for all items. Therefore, the most salient finding of this research study was that the engagement/empowerment aspects of relationship within the team were the most significant factors in respondents' perception of success within these virtual work teams followed by authenticity. As the respondent's sense of engagement and empowerment goes up or down, their perception of success goes up or down respectively. Likewise, as a sense of authenticity goes up or down, respondents' perceptions of success followed suit. This finding supported Lipnack & Stamps' (1999) research concluding that "relationships make the organization" (p. 18). The importance of relationship is not new as much of the existing literature emphasizes the significant role of relationship in virtual teams (C. B. Gibson & Manual, 2003; Maznevski &

Chudoba, 2000). The literature also emphasizes the need to focus on trust (C. B. Gibson & Manual, 2003), understanding and valuing differences (Gundling et al., 2011), and the development of connections between people or the human link (Klein & Kleinhanns, 2003). The survey respondents emphasized the importance of personal knowing, trust, and the human connection in the qualitative commentary. All of those items are tied to RCT (Jordan et al., 2004). Although this study focused on virtual teams, it may be that the findings would be emulated in a face-to-face work environment. Reilly and Lojeski (2009) have included both virtual and face-to-face teams in their research. They identified virtual distance, including affinity distance where team members have no relationship ties in all types of work settings.

While the regression analysis showed the relationship engagement/empowerment (RHI-EE_W) and authenticity (RHI-A_W) components had the most influence on the three outcome measures, for job satisfaction, the position the respondent served on the team also played a role. Those who identified themselves as team leaders rated job satisfaction higher than team members. Judge and Watanabe (1993) studied factors that improve job and life satisfaction. They found that those who have more control over work and over work decisions from beginning to end have a higher level of job satisfaction. Those in leadership positions would have more control, which could account for the higher rating for job satisfaction.

The regression analysis showed that, in addition to relationship variables, Respondent Team Tenure in 2 Groups (a member of the team for more than versus less than one year) and Perception of Overall Virtuality were the other factors influencing both relationship satisfaction and goal achievement. From a relationship satisfaction perspective, the literature on building relationships emphasizes that it takes time to build working relationships and personal connections (Lipnack & Stamps, 1999). Therefore, those respondents who were on teams for

longer than one year would have had more of an opportunity to build relationships. This attitude is likely related to the fact that individuals who were on teams for longer periods of time would have benefited from the opportunity to build connections and personal knowing. Commentary from the respondents emphasizes the importance of providing support to teammates and leveraging each member's strengths. Those who were on teams for more than one year rated perceived goal achievement higher than those who were on teams for less than one year. Virtual team literature highlights the importance of relationship to producing a functioning team (C. B. Gibson & Cohen, 2003) and the negative impact of affinity distance when there is no relationship (Lojeski & Reilly, 2010). To be productive, teams must have relationships. RCT highlights the benefits of high relationship quality resulting from the "five good things" (Miller & Stiver, 1997). One might assume that strong relationships and personal connections resulting from longer tenure with the team would facilitate productivity and, thus, the team would achieve their goals.

The last factor identified as influencing perceptions of success for goal achievement and relationship was perception of overall virtuality. Participants who rated their teams higher in overall virtuality also rated their teams higher in relationship satisfaction and goal achievement. The literature does not have a corresponding measure of virtuality to assist in the interpretation of this finding; however, this study has confirmed that there is a high degree of correlation between overall virtuality and the three subparts of virtuality (geographic, interaction, and technical tools. As communications in virtual work environments are so dependent upon technology tools, a high degree of virtuality and, hence, technical tools virtuality, would mean that those respondents effectively use such resources for communications. A high degree of expertise would facilitate performance so teams would achieve their goals and support virtual

relationship building. A number of studies have provided tactical methods for improving virtual team performance that included effective use of communications tools (Maznevski & Chudoba, 2000), leveraging technology to facilitate interaction (Kerber & Buono, 2004), and incorporation of social communications (L. Peters & Karren, 2009). In the narrative questions, survey respondents identified gaps in availability of and expertise in technology tools, a factor that is thus an area for additional research.

Adaptation of the RHI to virtual work team environments. The RHI incorporates three components of relationship: 1) authenticity, 2) empowerment, 3) and engagement. This study developed a new RHI-TEAM$_W$ that consisted of two components instead of the three used in the original RHI. The two components were a combination of the original RHI engagement and empowerment items (RHI-EE$_W$) and the authenticity component (RHI-A$_W$).

From a practical perspective, a review of the items within engagement and empowerment illustrated the linkage between the two. A review of previous studies added some additional perspective about the high correlation between engagement and empowerment. The introductory article of the RHI included a discussion about the high correlation between engagement and empowerment. Liang et al. (2002) acknowledged that a "high correlation between the engagement and empowerment/zest subscales begs the question of specifying two separate factors" (p. 29). Nevertheless, they determined that "the factors are strongly related but do reflect different factors conceptually" (p. 29). A review of the RHI as a measure of relational quality performed by Frey et al. (2005) identified a "unidimensional structure for both the peer and mentor composites, and a two-component structure for the community response" (p. 161). They suggested that RHI should be used as an overall measure of relationship instead of measuring relationship across the domains of friend, mentor, and community. They also asserted

that having separate engagement and empowerment components is not supported by the data. Based on the findings of this study and the results presented in prior studies, it may be assumed that the joining of empowerment and engagement into a consolidated component is an accurate representation for virtual team relationships.

Heretofore the research challenge has been to effectively measure relationship quality in a work environment. Through this research and the introduction of the application of RHI within virtual work environments a new tool has been introduced to the research community to measure relationship quality in ways that proved useful for understanding the specific relational qualities in the virtual work environment as aligned with perceived success.

Demographic differences in relationship. Demographic differences in the means of perceived importance and perceived existence of high-quality relationships were analyzed. The respondent and team demographics included: 1) respondent team position (team leader versus team member), 2) country/cultural background (same versus different), 3) age (under 50 versus 50 years and over), and 4) gender (male versus female).

For the perceived importance of high-quality relationships, team leaders provided higher ratings than team members and relationship quality between those of different countries/cultures was significantly lower than that between participants of the same country/cultural background. Statistical significance at the exploratory research level was identified for team leaders versus team members. The difference between mean scores of those from the same versus different country/cultural background resulted in a somewhat stronger level of significance than for the team leader versus team member analysis.

For the perceived existence of high-quality relationships team leaders provided higher ratings than team members and relationship quality between those of different countries/cultures

was significantly lower than that between participants of the same country/cultural background. Significance was identified for team leaders versus team members. The difference between mean scores of those from the same versus different country/cultural background also showed significance.

The discussion surrounding differences in relationship based on whether one was the team leader or team member has already been detailed in the discussion about the role of relationship in success section. The demographic difference based on country/cultural background is consistent with prior virtual team research. Virtual work environment literature identifies the difference in culture as one of the major challenges within virtual teams (C. B. Gibson & Manual, 2003). Qualitative commentary provided by the respondents also reinforced the importance of relationship and cultural inclusion. The application of the "Golden Rule" could be used to describe the focus on trust, respect, cultural inclusion, and relationship mentioned by the respondents. The importance of cultural inclusion reinforced the idea that cultural intelligence and effectiveness is important in virtual teams (Ang et al., 2007).

Significant difference was not identified within the other demographics included in the analysis (age and gender). The initial application of the Relational Model upon which the RHI was built was focused on women's psychological development (Liang et al., 2002). It was interesting that this study found no significant difference in these relationship measures across gender, therefore confirming that relationship is not just women's work.

The importance versus existence of high-quality relationships. The same demographics described in the demographic differences in relationship section (respondent team position, country/cultural background, age, and gender) were used to analyze difference in the mean scores between the perceived existence and perceived importance of high-quality

relationships. Overall, respondents agreed that high-quality relationships within their teams were important to them and they also agreed, to a somewhat lesser extent, that they had high-quality relationships in their teams. The difference in perceived importance versus the perceived existence was statistically significant for the overall population and for all demographics tested. This included the respondent team position, country/cultural background, age, and gender demographics. The largest gap existed between the importance and existence of high-quality relationships for the under 50 years of age group (20.5%) followed closely by males (19.3%) and team members (19.2%). But, again, the gap was significant for all demographics tested. From this analysis it may be inferred that, although virtual workers identify that high-quality relationships are important, they are not experiencing them in their work environments.

The components of virtuality. This study explored qualities of the virtual continuum to provide context for virtual work environment researchers and practitioners alike. The overall perception of virtuality was consistent with the individual three subcategories identified to measure virtuality (geographic, interaction, and technology tools). The highest correlation with the overall perception of virtuality was with the measure of virtuality based on the respondents' rating based on technical tools. This was an important finding. Most discussions surrounding virtual work environments usually begin with geographic dispersion, however, the high correlation between overall virtuality and technology tools indicated that while geographic aspects of virtuality were strongly correlated with overall perception, the correlation of the virtuality rating based on technology tools was even stronger. Technology is often viewed as a major solution for challenges in work environments. It is possible that the need to use the tools due to the geographic dispersion of the team may have caused respondents to equate the technology tools with the rating of their team's overall virtuality. The respondents who

participated in this study primarily worked from home offices (55.5%) and when the physical proximity of the teammates was analyzed, 41.4% of the teams worked in an environment in which all teammates worked from different locations. In fact, the majority of the respondents (61.7%) worked from a location in which none of the other teammates worked. As a result, the need to develop a communications strategy incorporating technology tools is an important aspect of virtual teams. Interestingly, whereas this study found significant difference for some demographics in the area of relationship, there was no variation based on demographics in the perception of virtuality for the virtuality ratings.

Many virtual teams have substituted the use of technology for face-to-face interaction in a distributed environment (Alderfer, 1977; Hackman, 1987). Researchers have recognized that the effective use of technology is a form of support that is vital to virtual interaction (Alderfer, 1977; Hackman, 1987). This study found a wide variety of aspects regarding work environments. The average time the respondents spent working individually was 51.3%. Communicating using technology tools accounted for 37.4% of the workers' time. Only 11.4% of the respondent's average time spent was with another person. Analysis of face-to-face meeting frequency identified 38.1% of respondents had never experienced meetings in which all or most of the team members were face-to-face. This measure was particularly difficult in the analysis as some respondents (5.3%) indicated that they meet either daily or a few times a week with all or most of the team members being face-to-face. Meeting daily or a few times a week with all or most team members face-to-face would appear to be inconsistent with the definition of a virtual team.

Participants in this study acknowledged that, logistically and cost-wise, face-to-face meetings were not possible; however, participant feedback emphasized the importance of some

type of face-to-face interaction. Respondents identified specific timeframes in which face-to-face meetings were important, including at the team's formation or when specific changes in direction were implemented. Respondent commentary reinforced the findings of Balthazard et al. (2009) specifying that the lack of non-verbal cues may impact a team's ability to develop shared meaning. Video was identified as a good alternative tool for providing visual cues; however, the team building aspects of in-person interaction were identified by numerous respondents as being vital to a team's long-term success.

Understanding context is importance in the use of technology tools for communications (Kahai et al., 2007). As technology has advanced, some teams are beneficiaries of state of the art tools. Technology provides the infrastructure to support virtual teams (Lipnack & Stamps, 1999). Gaps in technology tool usage, the success of the team in using the tools, and expertise level of the respondent were exposed in this study. It identified that online, text-based tools are prevalent as only 4.3% of the respondents indicated they do not use this tool and 78.7% use them daily. The level of expertise is high with fewer than 14% indicating that they are uncomfortable using text-based tools. Audio conferencing yielded similar results with only 4.0% having never used the tool and 52.6% using audio daily. Expertise is also extremely high with fewer than 3% reporting that they are uncomfortable with the tool. It is in the area of video that a wide gap became apparent. Those who never use video accounted for 22.7% of the respondents and only 13.9% used video daily. It is interesting to note that, for those who use video, fewer than 7% indicated they were uncomfortable with the tool, yet the level of extreme comfort using video (33.0%) was lower than text-based (55.8%) and audio (60.2%). Technology tools are important for facilitating virtual communications. An emphasis should therefore be placed on how technology tools are used and the interactions they produce (Lipnack & Stamps, 1999).

Work-life balance continues to be a topic in the world of virtual work. The flexibility with working virtually may contribute to a lack of work-life balance (Deery, 2008; Gambles, Lewis, & Rappaport, 2006). Energy surrounding sustainment of virtual workers was apparent in the commentary provided by respondents. The "voice of experience" also came through in the commentary regarding how to maintain balance and sustain a positive virtual work experience.

The detailed virtuality items provided insights into the variation of the virtual continuum, reinforcing the fact that there is not only one profile for virtual workers, while the overall virtuality rating provided a quantitative method to assess the impact of virtuality on relationship.

This study resulted in five major categories of findings. The first developed a proposed tool to measure relationship among team members (RHI-TEAM$_W$) and, with the use of the new tool, determined that relationship was the factor that most influenced perceived success. The adaption of the RHI to the RHI-TEAM$_W$ for use in virtual team environments was the second. The next category identified demographic differences in relationship between team leaders versus members and those of the same versus different country/cultural backgrounds. The significant gap between the more highly rated perceived importance of relationship versus the lower rated existence of relationship for all demographics was the fourth major finding. The final key finding of this study provided a wealth of knowledge about virtual teams, including geographic dispersion, interaction with teammates, usage of technical tools, and perceived ratings of virtuality. The key findings of this study were significant; however, there were some limitations of this study that should be acknowledged.

Limitations

It is important to discuss the limitations of this study so other researchers may use this information to improve upon future design. Although the majority of the limitations were

identified as part of the design process, there were compelling reasons for the research design decisions that may have contributed in some ways to these limitations. Limitations of this study may be classified into the following categories: 1) sample size and instrumentation, 2) measurement, and 3) bias.

Two major limitations of prior studies of virtual work environments (small sample sizes and/or the use of fabricated teams) have been addressed by the wide distribution of the survey as well as the requirement of participants to be a part of a virtual work team. By not including company and/or team name, there was a possibility that a large number of the respondents may have represented the same organization. Insight relative to this potential clustering was gained from reviewing some of the demographic information such as spread of industries and the length of time the teams have been in existence. Three industries dominated the survey: financial, technology, and education.

The anonymous nature of the survey meant that it was not possible to fully identify the respondent pool. It also precluded the ability to request clarification of specific responses. Anonymity of respondents was a deliberate choice made to ensure the confidentiality of responses surrounding the relationship questions. In subsequent research, not requiring full anonymity would likely provide the ability to clarify responses.

Every organization has its own internal dynamics. These dynamics may have contributed to the data obtained in this study. The larger sample provided some mitigation of this risk; however, the data may unknowingly reflect some of those internal dynamics. Areas that may have been impacted by organizational dynamics included relationship (both importance and existence) and use of virtual tools.

This study relied on the self-report from the respondents regarding the level of success they achieved. Relying on self-report of success is inherently challenging. In addition, a majority of the respondents represented teams that had been in existence for over a year. It may thus be assumed that they are biased toward virtual work environments. The structure of the question can thus be somewhat equated to "preaching to the choir" in that the respondents all rated both virtuality and relationship items fairly highly. In addition, the longevity of the teams represented in this study may mean that the data acquired may not align to those teams that are established for a short time solution.

The RHI has been used and validated in a variety of environments. The RHI items were modified slightly to measure relationship quality within a team. And the RHI uses a 5-point rating scale while this study utilized a 6-point scale for more granularity of responses. This is the first incorporation of RHI within a work environment. The RHI-TEAM$_W$ is different from the RHI in three major ways: 1) the difference in the rating scale, 2) the modification of the items, and 3), the nature of the relationship being measured was different than RHI. This means that comparison of results to existing studies is not possible. More research using this instrument in work environments is required.

As with possible respondent bias, I have been a part of virtual teams for a number of years and am a proponent of virtual work as well as the importance of face-to-face time. Given this professional background, in my role as researcher I may have been biased as I was interpreting the results.

A number of potential limitations of this study have been detailed. Both the key findings of this research and the limitations of this study yielded recommendations for future research and for those who work within or are dependent upon virtual teams. In spite of these limitations, this

research study has laid the groundwork for measurement of relationship in virtual teams and the relevance of relationship, virtual qualities, and demographic features of members to perceived team success (or, more specifically, the success component that was significant).

Recommendations for Future Research

The introduction of the RHI for application to those in work environments was groundbreaking. Researchers of both virtual as well as in person work environments now have a tool with which to measure relationship quality between teammates—RHI-EE_W and RHI-A_W. Virtuality measures were also developed by this study to provide context within virtual work teams. Recommendations for future research may be represented by the following categories: 1) additional analysis of data acquired in this study, 2) address study limitations, 3) include other relationship dynamics of peer and leader, 4) obtain additional in-depth knowledge of relationship through a longitudinal study, 5) incorporate additional tools, and 6) study and compare in-person versus virtual workers.

This study captured a wide variety of data that will serve future researchers in the area of virtual teams. Details surrounding virtual work environment and the tools that are utilized are comprehensive. The new RHI-$TEAM_W$ items may be analyzed independently to highlight different aspects of the team relationship. Qualitative narrative may also serve as a resource for future analysis of the data encapsulated by this study.

The second recommendation for future research is to conduct studies of intact teams. Inability to account for environmental differences would be eliminated by researching an intact team. Success measures for team goal achievement would then be developed from available performance data and would be concrete instead of perception measures. The perception of relationship satisfaction and job satisfaction would continue to be self-reported. As relationship

is sometimes thought of as controversial, anonymity of respondents would be maintained, however, clarification of commentary could be accomplished through team discussion about all of the commentary. An introduction provided by the leader of the team to emphasize the importance of open and honest ratings may be a way to reduce respondent bias. The ability to review the results with those who responded for confirmation that the researcher is correctly interpreting the data may eliminate researcher bias. Of the 256 respondents, 244 provided 37 single-spaced typed pages. The commentary was thoughtful and provided insight. It would have been beneficial to have had interviews (either individual or groups) to add additional information. This would have been especially helpful in the discussion surrounding trust. Relationship is multifaceted and should be measured beyond the dynamic between teammates.

The initial design of the survey instrument included items to measure the relationship dynamic between peers (based on RHI-Friend) and leader/member (based on RHI-Mentor). These items were removed due to the length of the survey. It is recommended that development of the other items be accomplished to fully analyze the relationship dynamics within a team. Although the majority of participants in this study indicated they use English as their primary language, misinterpretation might result if it is not one's native language.

The evolution of work environments, organizational goals, and relationship seems to point to the use of studying a population over the course of time. Relationships change and evolve over time. In an attempt to understand what impacts relationship, it is recommended that a longitudinal study be performed of an intact team. The longitudinal study would include assessing relationship at different points in time and aligning with changes within the work environment. An additional benefit of performing a longitudinal study may be the incorporation of additional assessments.

The amount of data obtained in this study was hindered by the need to utilize a survey that was not onerous in length. Additional information regarding trust and relationship would enhance the understanding of virtual work environments. Incorporation of tools such as the Propensity to Trust Scale (Rotter, 1971), Relationship Conflict Scale (Jehn, 1994), and Virtual Distance Index (Reilly & Lojeski, 2009) would add more breadth and depth to the data and more insight into relationship within virtual work environments.

The RHI has been used to study a variety of populations. An additional proposal for future research is to include both in-person and virtual workers. Understanding differences in relationship between in-person and virtual workers could serve to shed further light upon relationship in work environments.

I have proposed the above areas of recommended future research to enhance the body of knowledge. It is also valuable to address the specific implications for practitioners in the workplace.

Implications for Practitioners

The key findings and outcomes from this research provided additional implications for the practitioner as well as the leadership and change arena. They are organized into the following areas based on the targeted individuals: 1) virtual teammates, 2) virtual team leaders, 3) organizations that employ virtual teams, and 4) leadership and change.

All those who work virtually have been provided with a wealth of information and insight through this study. The implications for all virtual teammates, whether or not they are leaders or team members, included technology tools, personal knowing and support; trust and respect; cultural inclusion; and sustainment and balance.

A gap exists in the use of certain technology tools and the success achieved by the team with the tools and the level of expertise of the respondents. This was evident both in the commentary of the respondents as well as the quantitative data. The criticality of the various technology tools was not measured in this study; however, the importance of developing a means to close the knowledge gap and support team success with the tools at hand was emphasized.

The importance of building and sustaining relationships was identified as a key factor for success both via quantitative results and the commentary shared by participants. Respondents acknowledged that it takes time and effort to build personal knowing. Some may be directed by the leader; however, a great deal of responsibility of establishing connections is spread throughout the team. The development of a "helping" team environment was cited as a means of developing relationships. Recognition and appreciation were cited as a means of sustaining personal knowing.

Trust and respect were both common themes of the commentary. The respondents provided numerous examples of problems and how not to operate when discussing interpersonal relationships, including trust and respect. Trust and respect are outcomes from high-quality relationships. Using the RHI-EE_W and RHI-A_W to understand where there are issues in relationship quality may provide quantitative data to address gaps in trust and respect.

This study also identified the importance of understanding culture. Over half of the respondents (56.6%) relayed that their teams consisted of those from different country/cultural background. Never before have so many from different backgrounds come together to work for a common goal. Vaill (1996) coined the terms "cultural unlearning (p. 151)" and developing "cultural keys" (p. 157), providing very insightful commentary on how we must consciously unlearn what our dominant culture has taught for centuries. "A cultural key is not self-

knowledge, and it is not other-knowledge. It is knowledge of the self -in-relation-to-other" (p. 158). In fact, "finding a cultural key to unfamiliar situations is *unlearning as a way of being*" (p. 158). One of the themes of commentary provided by the respondents included a need to focus on cultural inclusion.

Techniques to promote sustainment and balance while working virtually were provided by the respondents. Different work environments and different personalities add complexity when attempting to identify how to best provide balance and sustainment. It is a major step to open up that conversation and share among virtual workers what works for them. It may spark others to use the same techniques. Attention to technology tools; personal knowing and support; trust and respect; cultural inclusion; and sustainment and balance are important whether an individual is a team leader or member.

In addition to the implications for team members discussed above, there are a range of other implications for those who lead teams in virtual work environments. Booysen (2011) relayed the difference between a leader and leadership. A leader is simply a role to be performed while leadership is the action taken and behavior exhibited to achieve a goal. This research reinforced the notion that leadership is less about a position of authority and more about guiding a team to success. Booysen (2011) shared that leadership is more about being than doing. It is a mind-shift of thinking of leadership as the interconnections and the space in between that which is connected. Just as beauty is in the eyes of the beholder, a leader's effectiveness is perceived through the follower's context. The implications expounded upon for all team members go deeper for leaders because of their leadership role. Additional implications in the area of team structure and processes and in-person interaction are specifically focused in the virtual team leader's arena.

The first implication for team leaders involves leading by example. Laying a foundation for personal knowing and support; trust and respect; cultural inclusion; and sustainment and balance are paramount to developing a work environment that includes the desired state of being. Personal knowing may be facilitated by a leader by using some of the techniques suggested in the research commentary such as cross-training. A leader may also employ the RHI-EE_W and RHI-A_W to provide data about the team and open up dialogue amongst teammates as to how to improve.

The respondents in this study overwhelmingly emphasized the importance of structure and team processes. By nature of the leadership role, a virtual team leader is responsible for setting the tone for meetings and processes. The leader of the team is also responsible for the provision and effective use of tools to facilitate communication. Establishing personal tool competency as a performance metric may highlight the importance of effective use. The importance of face-to-face meetings was also identified by the respondents as valuable. Budgetary constraints were acknowledged; however, some respondents emphasized that even one or periodic infrequent face-to-face meeting(s) are invaluable. Clearly, the role of leader is critical to the success of virtual teams; therefore the implications for virtual leaders are significant.

Organizations that employ virtual teams can take advantage of numerous benefits; for example, access to the best resources regardless of geographical bounds and a possible reduction in the real estate expense are both beneficial. Work-life balance is another benefit organizations emphasize to their employees. The commentary on topics related to sustainment and balance also reflected a need for acknowledgement of some of the challenges of working virtually.

Organizations should pay attention to the need for periodic face-to-face meetings and the employment of technology tools with which to connect employees.

Implications for the members of the leadership and change community who seek to understand more about organizations, leaders, and team members have also been provided by this study. This study contributed insights into virtual work environments, identifying numerous gaps that require attention. The overarching gap is between perceived existence of relationship and how important high-quality relationships are to the individuals. This study identified that both the existence and importance of relationship was not influenced by gender. The longevity of the virtual teams represented in this study means that much of the leadership recommendations that have been based on short-term team duration require additional scrutiny. An Executive Summary has been provided as Appendix L and is available in color on the research page of my professional website (www.RansoneGroup.com/Research).

Conclusions

From its initial design, this study had very specific goals. As a result of each phase of this research, this study:

1. Illuminated the impact of relationship on perceived success across the virtual continuum and provided guidance to those working in virtual environments on how to improve connections.
2. Highlighted the importance of RCT, pulling it into mainstream research and provided visibility and applicability to the business world.
3. Provided visibility into the importance ratings of specific items to identify and understand the gap between the current and desired levels of relationship.
4. Added to the body of knowledge about virtual team environments.

5. Provided valuable insights and recommendations for those working in virtual work environments.

Global virtual work environments have some of the same challenges as in person ones, and some that are unique. We thus need a set of tools, a virtual pallet of resources, to enable both team leaders and team members to understand the cultural context of those they work with and to provide ideas and tips for how to connect across geographical boundaries. Resources are available, yet remain scattered. Bountiful essays on diversity and contextual culture exist—companies have even created search tools to unmask cultural norms.

Working in a diverse environment goes beyond understanding norms. We need to understand how to best connect individuals. The connection cannot be artificial and must be done as a matter of course. It needs to be done in a thoughtful, caring, and diplomatic way such that each individual feels and is valued. Virtual teams must find a replacement for "water cooler" conversations. How can we best recreate the informal network, the understanding of common interests? Is it a "virtual coffee break" or scheduled one-on-one debriefs? Certainly, individual needs are unique, not conforming to a mold, especially within the wide variety of work environments experienced by virtual workers.

As we peel back the layers of virtual work environments, we are uncovering the lost secret—the special ingredient—of linking people regardless of cultural or geographical boundaries. It is my opinion that leveraging the work of this study to understand the implications of relationship as measured by the RHI-EE_W and RHI-A_W will have a positive impact. It will be exciting to learn further about virtual team dynamics and to develop the previously discussed "virtual pallet" of tools to support leaders and followers as they strive toward producing outstanding results through virtual engagement.

Arthur Morgan was quoted by Dr. Laurien Alexandre during Antioch University's 2008 Commencement address as saying "The purpose of an Antioch education is that while we are learning to be effective, we should also be learning what is most worthwhile to be effective about." She added that "our purpose is to know what is worthwhile to study about, to fight for, and to pursue. For our graduates, the purpose of studying leadership is not power or privilege, it is fairness, justice, inclusion, equity, and peace." Understanding virtual work environments is one that is very valuable and worthwhile for all, especially given the numbers of workers who are currently working virtually.

Vaill (1996) contended that "The presence of permanent white-water demands that we look anew at the challenge of continual life-long learning – what it involves, what the barriers are, and whether we even understand it well enough to practice it" (p. 20). And certainly virtual work environments could be classified as Category 5 rapids. The magnitude of change that continues – both in the numbers of individuals working virtually and the technology that supports them – requires flexibility and adaptability. Virtual

workers of today and tomorrow must continue to expand their knowledge and capabilities, accepting Vaill's challenge to engage in life-long learning. It is my hope that this research study has provided foundational information to support the continued evolution of the virtual world of work.

Appendix

Appendix A

Table A.1

Definition of Terms and Phrases

Term or Phrase	Definition
Cohabitated	Similar to collocated. Identifies those who work together in the same primary work location
Collocated	Similar to cohabitated. Identifies those who work together in the same primary work location.
Connections	A term used to represent the level of interpersonal bonding and support that is provided between individuals.
Distributed	Similar to virtual – identifies those who are not physically in the same primary work location. Those who work with others who are not face-to-face, using technology tools with which to communicate.
primary work location	The work place from which one works the majority of the time
Relational Health Indices (RHI)	A scale used to measure relationship quality that includes authenticity, empowerment, and engagement components
team	A group of a minimum of three individuals who have responsibility for work products. They all report to the same manager.
virtual	Similar to distributed. Identifies those who are not physically in the same primary work location. Those who work with others who are not face-to-face, using technology tools with which to communicate.
virtual team	A group of individuals who are in different locations and who work together through technology facilitated communication to achieve common goals.
virtuality	A new descriptor that identifies that someone is working remotely or not face-to-face

Appendix B

Table B.1

Initial Review of Virtual Literature

Title	Authors	Periodical or Type of Reference	Date	Primary Research Question	Findings/Outcomes	Methodology	Method		
							Mixed	Quantitative	Qualitative
A cross-cultural test of the 'five-factor model of personality and transformational leadership'	Shao,Lian;Webber,Sheila	Journal of Business Research	2006	How applicable is the "Five-Factor Model of Personality and Transformational Leadership" when one examines the Chinese culture?	• Certain personality traits positively associated with transformational leadership behavior in the North American context are not evident in the Chinese environment. • Hofstede's four cultural dimensions, culture tightness and self-monitoring theory are used to explain the differences between our outcomes and those of Judge and Bono.	• All participants were either current (200) or prior (120) EMBA/MBA students. • Pilot of 10 students • Questionnaires were distributed to be completed by student and two of their direct reports		Y	
A work roles and leadership functions of managers in virtual teams	Konradt,Udo; Hoch,Julia E.	International Journal of e-Collaboration	2007	How may virtual team success be promoted by understanding the difference and similarities of the perception of line versus middle managers in the areas of work roles and leadership functions?	• Line managers believe that stability leadership functions are most important for success • Middle managers place more value on people oriented leadership and work role flexibility as more important for success	• A questionnaire was responded to by 97 managers from a global company • The questionnaire included leadership behavioral, work role, leadership functions, and demographic related question		Y	

Title	Authors	Periodical or Type of Reference	Date	Primary Research Question	Findings/Outcomes	Methodology	Method		
							Mixed	Quantitative	Qualitative
An empirical study of best practices in virtual teams	Lurey,Jeremy S.; Raisinghani, Mahesh S.	Information & Management	2001	What are the factors that support or negatively impact the success of virtual teams?	• Many of the problems facing virtual teams are the same as those of collocated teams • It is important for leaders to create structure for measurement and operating • It is necessary to focus on connecting virtual teammates • Proactively addressing communications issues is paramount	• A quantitative and qualitative survey was conducted among 67 individuals within eight companies	Y		
An examination of the roles of trust and functional diversity on virtual team performance ratings	Peters,L.; Karren,R. J.	Group & Organization Management	2009	What is the relationship between trust, diversity, and performance in a virtual team environment?	• Team members indicated that trust and diversity has a direct impact on performance, however external managers did not show this direct correlation • There is a difference in the way trust is developed between virtual and face-to-face teams	• Research was conducted with approximately 200 members of virtual teams		Y	

Title	Authors	Periodical or Type of Reference	Date	Primary Research Question	Findings/Outcomes	Methodology	Method		
							Mixed	Quantitative	Qualitative
Bridging space over time: Global virtual team dynamics and effectiveness	Maznevski,M. L.;Chudoba,K. M.	Organization science	2000	How do effective global virtual teams fit their communication patterns to the task?	In effective global virtual teams: • The higher the level of decision process served by an incident, the more rich the medium appropriated and the longer the incident's duration. • The more complex the message context of an incident, the more rich the medium appropriated and the longer the incident's duration. • If rich medium is not required, the most accessible medium will be used. • If an incident serves multiple functions or messages, its medium and duration will be shaped by the highest function and the most complexity. • The higher the task's required level of interdependence, the more communication incidents will be initiated. • The more complex the task, the more complex the incident's messages will be. • The greater the organizational and geographic boundaries spanned by a global virtual team's members, and the greater the cultural and professional differences among team members, the more complex the team's messages will be. • The stronger the shared view and relationship among global virtual team members, the less complex the team's messages will be • If other things are equal, the receiving member's preferences and context determines an incident's medium. • Develop a rhythmic temporal pattern of interaction incidents, with the rhythm being defined by regular intensive face-to-face meetings devoted to higher decision processes, complex messages, and relationship building.	• An analysis of similar research projects was captured via table. • Three separate global virtual teams were studied over a period of time. • Multiple methods of collecting data were used including case study capture and both qualitative and quantitative analysis.	Y		

Title	Authors	Periodical or Type of Reference	Date	Primary Research Question	Findings/Outcomes	Methodology	Method		
							Mixed	Quantitative	Qualitative
Building trust and collaboration in a virtual team	Holton,J. A.	Team Performance Management	2001	What is the applicability of some standard team building tools to the unique needs and environment of a virtual team?	• Standard team building tools can be used to enhance collaboration and trust in a virtual team. • As with all team building, there is no quick fix for virtual teams. • Attention to process is the critical factor in addressing limitations to team growth. • Regardless of technological advances in virtual communications, change in the way we work together is a process not an event. • Face-to-face interaction will continue to play a very important role in our work relationships regardless of how virtual our environment may become.	• One six member virtual team that provides staff support to a regional, not-for-profit health promotion organization.	Y		
Building Trust and Cooperation through Technology Adaptation in Virtual Teams: Empirical Field Evidence	Thomas,D.; Bostrom,R.	Information Systems Management	2008	How do managers build trust and cooperation leveraging communications technology and how do various leadership styles impact effectiveness?	• The theory that command and control leaders hinder effective outcomes in virtual teams was not supported – some virtual teams work well in this environment • Trust and cooperation were significantly related to technology adaption	• Developed an interview protocol refined through two pilot tests • Collected 52 incidents from 13 team leaders • Six judges coded the results who then came together for evaluation			Y
Collaborating with "virtual strangers": Towards developing a framework for leadership in distributed teams	Al-Ani,Ban; Horspool,Agnes; Bligh,Michelle C.	Leadership	2011	What is an effective framework for leadership of distributed teams?	• Leadership functions may vary based when teams are geographically and temporal dispersed • Leaders play an important role in structuring group tasks • Virtual teams are more conducive to non-traditional leadership	• Sixteen employees from one company across different geographical sites were interviewed • Quantitative and qualitative questions were included in the interview process	Y		

Title	Authors	Periodical or Type of Reference	Date	Primary Research Question	Findings/Outcomes	Methodology	Method		
							Mixed	Quantitative	Qualitative
Conflict and Shared Identity in Geographically Distributed Teams	Mortensen,Mark;Hinds,Pamela J.	International Journal of Conflict Management	2001	What is the amount of affective and task conflict reported in collocated versus geographically distributed teams?	• Shared team identity may help distributed teams with managing task conflict but it does not help collocated teams. • The same dynamic was found for affective conflict.	• 141 members of 24 product development teams within 5 companies • Online questionanire		Y	
Constructing corporate commitment amongst remote employees: A disposition and predisposition approach	Jacobs,Glenda	Corporate Communications	2008	What are the relationships and communications conditions that impact remote workers?	• Whether an employee will continue to work for an employer is a separate question from whether s/he will act in the company's best interest • It is important to identify an employees' mental relationship model to understand the nature of his/her relationship to the organization	• Semi-structured interviews were conducted • Data was analyzed and coded using both open and focused coding • Twenty-four participants were members of two UK-based corporations • Data was supplemented by site visits and direct observations			Y
Cross-Cultural Virtual Team and Its Key Antecedents to Success	Eom,M.	The Journal of Applied Business and Economics	2009	What are the unique dynamics of a virtual team and how does the impact of being virtual impact the process of developing trust among its members with different cultural backgrounds?	A proposed model was developed to assist practitioners of virtual teams • Transactional and transformational behaviors on the part of a virtual team leader will be closely associated with the development of trust in a virtual team. • Virtual team members' cultural backgrounds will be closely associated with the development of trust in a virtual team. • The impact of a virtual team leader's transactional and transformational behaviors on the development of trust in a virtual team will vary depending on virtual members' different cultural backgrounds.	• There was no direct research methodology or sample information provided.			

Title	Authors	Periodical or Type of Reference	Date	Primary Research Question	Findings/Outcomes	Methodology	Method		
							Mixed	Quantitative	Qualitative
Cultural differences in e-mail use of virtual teams: A critical social theory perspective	Lee,Ook	CyberPsychology & Behavior	2002	What is the importance of the Critical Social Theory's concept called "critical reflection" in how email is used in virtual teams?	• Although some cultures rely heavily on email, cultural protocol makes those of some cultures less likely to use the tool (Confucius tradition-influenced) • Managing communications within a team must take into account cultural differences	• A Case Study was conducted with a virtual team made up of 17 members • The team was geographically separated across three continents • Interviews of team members were coded and analyzed			Y
Cultural Intelligence: Its Measurement and Effects on Cultural Judgment and Decision Making, Cultural Adaptation and Task Performance	Ang,Soon; VanDyne,Linn; Koh,Christine; Ng,K. Y.; Templer,Klaus J.; Tay,Cheryl; Chandrasekar,N. A.	Management and Organization Review	2007	What is the relationship between the four measures of cultural intelligence and three intercultural effectiveness outcomes?	• Established a baseline and provided strong empirical support for understanding the relationship between cultural intelligence and intercultural effectiveness	• Developed a Cultural Intelligence Scale • Performed multiple tests of the scale with undergraduates in Singapore • Final study included undergraduates from the US (235) and Singapore (358)		Y	

Title	Authors	Periodical or Type of Reference	Date	Primary Research Question	Findings/Outcomes	Methodology	Method		
							Mixed	Quantitative	Qualitative
Cultural variation of leadership prototypes across 22 European countries	Brodbeck,Felix C.; Frese,Michael; Akerblom,Staffan; Audia,Giuseppe; Bakacsi,Gyula; Bendova,Helena; Bodega,Domenico; Bodur,Muzaffer; Booth,Simon; Brenk,Klas; Castel,Phillippe; DenHartog,Deanne; Donnelly-Cox,Gemma; Gratchev,Mikhail V.; Holmberg,Ingalill; Jarmuz,Slawomir; Jesuino,Jorge Correia; Jorbenadse,Ravaz; Kabasakal,Hayat E.; Keating,Mary; Kipiani,George; Konrad,Edvard; Schramm-Nielsen,Jette; Schultz,Majken; Sigfrids,Camilla; Szabo,Erna; Thierry,Henk; Vondrysova,Marie; Koopman,Paul; Kurc,Alexandre; Leeds,Christopher; Lindell,Martin; Maczynski,Jerzey; Martin,Gillian S.; O'Connell,Jeremiah; Papalexandris,Athan; Papalexandris,Nancy; Prieto,Jose M.; Rakitski,Boris; Reber,Gerhard; Sabadin,Argio; Wilderom,Celeste; Witkowski,Stanislaw; Wunderer,Rolf	Journal of Occupational and Organizational Psychology	2000	How do concepts of leadership differ across the cultural differences in Europe?	• There are five clusters of similarity between European countries that share the same cultural values and leadership concepts • Detailed information is provided about the clusters of countries • It is critical to understand the clusters and cultural differences to be successful in a culturally diverse environment	• Middle-level managers (6052) from 22 European countries were surveyed		Y	

Title	Authors	Periodical or Type of Reference	Date	Primary Research Question	Findings/Outcomes	Methodology	Method		
							Mixed	Quantitative	Qualitative
Culture-based values and management style of marketing decision makers in six Western Pacific Rim countries	Albaum,Gerald; Yu,Julie; Wiese,Nila; Herche,Joel; Evangelista,Felicitas; Murphy,Brian	Journal of Global Marketing	2010	What is the relationship between management style and cultural value of leaders?	• The relationship between management style and cultural values is statistically high • Knowledge and understanding of cultural differences is a key leadership tool	• A quantitative questionnaire was employed to measure management style and cultural values of leaders • Data from Hofstede's research was used to evaluate results		Y	
Cybercentrism: The new, virtual management	Gordon,Lansing Alexander	Management Decision	2001	Is there a need to create a new model for virtual team management?	• A new model of management is emerging for the virtual environment as a result of o Computer literate management o Rise in importance of technology o Move towards ERP systems o Trend towards open systems and elimination of middleware	• Six executives were interviewed as part of this research • Little was included in the article regarding methodology or the respondents demographics			Y
Differences between on-site and off-site teams: manager perceptions	Stevenson,Walt; McGrath,Erika Weis	Team Performance Management	2004	What are the differences between virtual and face-to-face teams when a manager evaluates performance and where should managers focus when working within a virtual environment?	• There was difference in perceptions pre versus post assessments in all measured areas • Managers place importance on effective team leadership, commitment, and regular personal contact • Managers do not always understand the importance of less intuitive managerial methods	• MBA students from the United States and Singapore who were already in managerial jobs participated in the study • Three virtual teams were assigned tasks • Pre and post assessments were conducted		Y	

Title	Authors	Periodical or Type of Reference	Date	Primary Research Question	Findings/Outcomes	Methodology	Method		
							Mixed	Quantitative	Qualitative
Establishing trust in virtual teams	Watts,Alex	Book, Section	2009	What are the tools and techniques to be used to build virtual teams?	• Identified five ways of looking at trust in work relationships. • Strategies that managers use to establish trust. • Two stage process that managers follow when building relationships with the distant members of the virtual team and how they decide whether the other team members are trustworthy. Included is why the two-stage process works the way it does.	• Semi-structured interviews with 10 senior IT managers			Y
Five challenges to virtual team success: lessons from Sabre, Inc.	Kirkman,B. L.;Rosen,B.;Gibson,C. B.;Tesluk,P. E.;McPherson,S. O.	The Academy of Management Executive (1993-2005)	2002	What challenges specific to virtual teams may impact success?	Table 1 on page 70 identifies the following virtual team challenges and the lessons learned from Sabre • Establishing trust based on performance consistency rather than social bonds. • Overcoming group-process losses associated with virtual teams • Creating a virtual environment of inclusiveness and involvement • Identifying virtual team members who have a healthy balance of technical and interpersonal skills • Establishing the appropriate quantitative and qualitative data for accurate assessment of virtual team members • Developing creating approaches for providing feedback, coaching, and support for virtual team members	• Interviews with over 75 executives, team leaders, and team members of Sabre		Y	

Title	Authors	Periodical or Type of Reference	Date	Primary Research Question	Findings/Outcomes	Methodology	Method		
							Mixed	Quantitative	Qualitative
Global virtual teams for value creation and project success: A case study	Lee-Kelley,L.; Sankey,T.	International Journal of Project Management	2008	Do virtual projects present unique challenges and how are they more useful than projects undertaken by collocated teams?	• Biggest challenges of virtually managed teams are time zone, cultural differences, and communications • Experienced virtual workers seldom identify problems as being attributed to virtual work • Face-to-face interaction builds trust and is valuable for team interaction	• An ex post facto Case Study of two data centers – one in Asia and the other was EMEA • A small pilot was conducted (three interviews) • Following the pilot, invitations for interviews were sent to 22 project managers. • Eleven interviews took place • Additional data was obtained through documented evidence of post-implementation review and lessons learned reports			Y
Here Be (No More) Dragons: Pushing the Frontier of Research on Virtual Organizations and Teams	Assmann, J. J.; Drescher,M. A.;Gallenkamp,J.;Picot,A.;Welpe,I. M.	Conference Proceedings	2010	Two research projects employed the use of MMOGs to provide a large diverse population in a more controlled environment. Both studies researched the question: What are the antecedents and consequences of trust in virtual teams?	• Overall, the researchers contend that MMOGs provided an ability to test leadership theory in cost effective manner. • The first study found that the team's use of effective communications was paramount to trust. • The second study also found that the quality of communications and exchanges were positively related to trust in the leader.	The studies used the same methods for obtaining data, including online surveys and a review of the available gaming database information. The following provides details of each study: • 13,941 participants from 1,883 teams in 23 countries whose average age was 29 years (18-75 range). 18% were female. The average percentage of respondents per team was 18%. • 71 virtual organizations consisting of 71 virtual team founders and their 646 team members whose average age was 29 (18-75 range). 25% were female. The average percentage of respondents per team was 29%.		Y	

Title	Authors	Periodical or Type of Reference	Date	Primary Research Question	Findings/Outcomes	Methodology	Method		
							Mixed	Quantitative	Qualitative
Home-based teleworking and the employment relationship: Managerial challenges and dilemmas	Harris,Lynette	Personnel Review	2003	What are the managerial challenges or dilemmas associated with virtual work?	• It is important to assess each individual's situation to determine whether virtual work is applicable	• Pre and post surveys were conducted assessing the virtual work arrangement. • Two focus groups were conducted • Individual interviews were conducted	Y		
'I don't see me like you see me, but is that a problem?' Cultural influences on rating discrepancy in 360-degree feedback instruments	Eckert,Regina; Ekelund,BjÃ¸rn Z.; Gentry,William A.; Dawson,Jeremy F.	European Journal of Work and Organizational Psychology	2010	How do cultural values impact performance ratings in the areas of decision making, leading, and self-control?	• There is strong evidence that cultural values affects rating discrepancies between an individual and his/her observers • Number of direct observations is positively correlated with how closely the ratings of others are similar to self-ratings	• The BENCHMARKS® assessment tool was given to 4019 managers from 35 countries • The differences between an individual's self-ratings and those of his/her manager, peers, and employees were assessed		Y	
Identity, identity work and the experience of working from home	Tietze,Susanne; Musson,Gill	Journal of Management Development	2010	How has the advent of working virtually impacted a manager's identity when s/he is influenced by different social-cultural spheres?	• The success or failure of a virtual worker is directly tied to his/her identify and sense of self • Family members and their relationships are also critical to the success of one who works from home	• The study was conducted in the UK and included 25 managers and their families • Semi-structured interviews were conducted and observational data was collected during home visits • Three case studies were included that detailed how identity is critical			Y
Implications of virtual management for subordinate performance appraisals: A pair of simulation studies	Golden,Timothy D.; Barnes-Farrell,Janet; Mascharka,Peter B.	Journal of Applied Social Psychology	2009	How do managers of virtual teams use the employee's performance information?	• If one is rated highly, the manager readily uses virtually obtained performance feedback • An employee should actively work towards marketing his/her efforts to a virtual manager	• Three studies were conducted to assess whether manage places more value on performance information that is obtained face-to-face as opposed to virtually • Behavioral anchors developed by Barnes-Farrell were used		Y	

Title	Authors	Periodical or Type of Reference	Date	Primary Research Question	Findings/Outcomes	Methodology	Method		
							Mixed	Quantitative	Qualitative
In strangers we trust? Findings of an empirical study of distributed teams	Al-Ani,B.;Redmiles ,D.	Conference Proceedings	2009	What are some of the challenges encountered and practices adopted by developers working in a large cutting-edge Fortune 500 organization, specifically in the areas of leadership, communication, and exchange of ideas?	• Trust is more likely to be an issue of concern to developers working in large distributed teams. • Trust is more likely to be an issue when developers in a distributed team are to deliver an innovative or new product. • Trust is more likely to be an issue, the greater the diversity of the team's distribution. • Trust is more readily granted to an authoritative team member characterized by leadership qualities within a distributed team.	• Emailed survey of both closed and open ended questions • Sixteen employees of a Fortune 500 development firm.	Y		
In the eye of the beholder: Cross-cultural lesson in leadership from project GLOBE	Javidan, M.; Dorfman, P.W.; Luque, M.S.; House, R.J.;	Academy of Management Perspectives	2006	What are the challenges that face global executives today and how might corporations address those challenges?	• Developed a two-step process for leaders of globally diverse teams: share information about each country and determine how to bridge the cultural gap • Emphasized cultural adaptability as a key strength of a leader	• Used a hypothetical case of an executive from the United States to analyze how s/he leads similar teams in Brazil, France, Egypt and China • Leverages Project GLOBE quantitative data		Y	
Institutional explanations for managers™ attitudes towards telehomeworking	Peters,Pascale; Heusinkveld,Stefan	Human Relations	2010	What is the importance of the managerial role in adopting a virtual work environment?	• A manager's adoption level of virtual work directly impacted that of his/her employees • Role plays a key factor in determining what types of factors influence adoption • CEOs look to peers to provide guidance • HR managers look to those whom s/he represents to provide guidance	• Large-scale survey of Dutch organizations, including 96 CEOs and 380 HR managers		Y	

Title	Authors	Periodical or Type of Reference	Date	Primary Research Question	Findings/Outcomes	Methodology	Method		
							Mixed	Quantitative	Qualitative
Interpersonal Trust in Cross-Functional, Geographically Distributed Work: A Longitudinal Study	Zolin,Roxanne;Hinds,Pamela J.;Fruchter,Renate;Levitt,Raymond E.	Information and organization	2004	How should traditional models of trust be adapted to describe the development of trust between cross-functional, geographically distributed partners.	• Initial perceptions of trustworthiness are important in cross-functional, geographically distributed work groups.	• Longitudinal study of architecture, engineering, and construction management students engaged in a project • Online surveys of 108 individuals making up 12 teams • Measured trust, risk, reward, perceived trust, and perceived follow-through		Y	
Is anybody out there?: antecedents of trust in global virtual teams	Jarvenpaa,S. L.;Knoll,K.;Leidner,D. E.	Journal of Management Information Systems	1998	What are the antecedents of trust in a global virtual-team setting?	• The two-week trust-building exercises did have a significant effect on the team members' perceptions of the other members' ability, integrity, and benevolence. • In the early phases of teamwork, team trust was predicted strongest by perceptions of other team members' integrity, and weakest by perceptions of their benevolence. • The effect of other members' perceived ability on trust decreased over time. • The members' own propensity to trust had a significant, though unchanging effect on trust.	• All of the participants were MBA students participating in a virtual collaboration session. • Seventy-five teams consisting of four to six members residing in different countries interacted and worked together for eight weeks.	Y		

Title	Authors	Periodical or Type of Reference	Date	Primary Research Question	Findings/Outcomes	Methodology	Method		
							Mixed	Quantitative	Qualitative
Is transformational leadership universal? A meta-analytical investigation of multifactor leadership questionnaire means across cultures	Leong,Lai Yin Carmen;Fischer, Ronald	Journal of Leadership & Organizational Studies	2011	Is transformational leadership universal?	• Highlighted the usefulness of meta-analysis for analyzing published research. • There are significant shortcomings and gaps in current research • Transformational leadership means were consistently correlated with hierarchical versus egalitarian dimensions of culture.	• This was meta-analysis of research articles. • Researched and found 934 articles including specific key words • Further criteria was used to determine whether to use the article - Multifactor Leadership Questionnaire usage, participants were adults, and analysis of transformational leadership was included • 20 articles were selected and coded.		Y	
Leadership Challenges in Global Virtual Teams: Lessons From the Field	Kerber,Kenneth W.; Buono,Anthony F.	S.A.M.Advanced Management Journal	2004	What is the relationship between leadership behaviors (transformational and transactional) and knowledge management	• Challenges of virtual global teams were identified • Specific best practices were identified to overcome obstacles • The importance of what and how something is communicated is the most critical factor for success	• A Case Study of a virtual team within a global organization undergoing significant organizational change • The team consisted of eleven persons from across the US, UK, Ireland, and Australia • Little more was provided regarding methodology except that the study observed the team's operations.			Y
Leadership Dynamics in Partially Distributed Teams: an Exploratory Study of the Effects of Configuration and Distance	Ocker,Rosalie J.; Huang,Haiyan; Benbunan-Fich,Raquel; Hiltz,Starr Roxanne	Group Decision and Negotiation	2011	What are the effects of virtual distance (geographic, cultural, and temporal) upon virtual teams?	• The location of the leader and the number of members within a site impacted the team's success • Teams with emergent and/or distributed leaders outperformed their counterparts	• Experiment with 71 students randomly assigned to 12 virtual or face-to-face teams • Team leaders were randomly assigned • Participant reflections and experimenter observation were the two main sources of data			Y

Title	Authors	Periodical or Type of Reference	Date	Primary Research Question	Findings/Outcomes	Methodology	Method		
							Mixed	Quantitative	Qualitative
Leadership effectiveness in global virtual teams	Kayworth,Timothy R.; Leidner,Dorothy E.	Journal of Management Information Systems	2001	What are the key traits of effective virtual leaders?	Effective virtual leaders: • exhibit understanding and act in a mentoring role • have strong communications skills • establish clear guidelines	• Experiment creating 13 virtual teams composed of 5-7 members in 3 different locations • A quantitative survey was conducted to assess leadership effectiveness • A qualitative assessment was conducted to measure both the team and the leader's effectiveness	Y		
Leadership in a global virtual team: An action learning approach	Pauleen,David J.	Leadership & Organization Development Journal	2003	How do virtual team leaders cope with issues surrounding completing complex tasks?	• "This case seems to support the notion that virtual team leaders are often the nexus of a virtual team and that effective leadership strategies can counter otherwise challenging aspects of virtual work. • Many of the issues raised in the discussion section point to both practical leadership strategies for virtual team leaders and further avenues of research in the area of virtual team leadership and culture, team structure and dynamics, organizational policies, and the use of communication channels." (p. 161). • Items included in the discussion section are: o Importance of dealing with ambiguity o Regular and detailed communications is necessary no matter how deadline driven the environment o The use of a hub structure made things more easily to manage and establish trust within the team. o Use the telephone to establish a relationship and then follow-up quickly with email.	• Research took place over three years • Consisted of one leader and her team that was distributed across New Zealand and Australia • Two interpretive qualitative methodologies: action learning and data/gathering with grounded theory to analyze			Y

Title	Authors	Periodical or Type of Reference	Date	Primary Research Question	Findings/Outcomes	Methodology	Method		
							Mixed	Quantitative	Qualitative
Leadership roles, socioemotional communication strategies, and technology use of Irish and US students in virtual teams	Flammia,Madelyn; Cleary,Yvonne; Slattery,Darina M.	IEEE Transactions on Professional Communication	2010	How may team collaboration be facilitated in virtual teams?	• Teams that organized by assigning specific roles based on skills and knowledge were more satisfied • Teams who established socioemotional communications were more connected and satisfied • A form of technologically enabled "chat" was used by the most effective of teams • Group connections, trust, and satisfaction may occur even in the shortest duration projects	• Qualitative analysis of an experiment, analyzing the effectiveness of 26 graduate students • Students were grouped into seven teams and participants were not identified to their teammates • The team to which each student was assigned was also not revealed • Students were assigned to seven different teams and assigned specific tasks			Y
Leadership styles and group organizational citizenship behavior across cultures	Euwema,Martin C.;Wendt,Hein; van Emmerik,Hetty	Journal of Organizational Behavior	2007	What are the effects of societal culture on group organizational citizenship behavior (GOCB), and the moderating role of culture on the relationship between directive and supportive leadership and GOCB.	• There was no direct relationship between Hofstede's individualism and power distance dimensions and GOCB. • Directive leadership had a negative relation, and supportive leadership positive relation with GOCB. • Culture moderated this relationship: Directive leadership was more negatively , and supportive behavior less positively, related to GOCB in individualistic compared to collectivistic societies.	• Data were collected from 30226 managers and 95893 team members in 33 countries.		Y	
Leading the virtual workforce: how great leaders transform organizations in the 21st century	Lojeski,K. S.;Reilly,R. R.	Book, Whole	2010	How does one become a great leader in the Digital Age and what leadership model may be used to support the virtual workforce?	• Common myths about leadership of virtual workers were identified and insights and suggestions were provided for operating effectively were presented • The rationale for dispensing with old leadership models and support for the new leadership model using Virtual Distance was presented	• Interviews were conducted with high-level executives and other exemplar leaders. Eleven of the leaders were named and quoted in the book.			Y

Title	Authors	Periodical or Type of Reference	Date	Primary Research Question	Findings/Outcomes	Methodology	Method		
							Mixed	Quantitative	Qualitative
Managerial implications of the GLOBE project: A study of 62 societies	Javidan,Mansour; Dastmalchian,Ali	Asia Pacific Journal of Human Resources	2009	What are the key findings of the Project GLOBE study and what are the resulting implications for global leaders?	• Identified six areas of managerial implications for global leaders • There is significant complexity when working across cultural dimensions • Project GLOBE provides a valuable information resource for global leaders	• Leveraged Project GLOBE quantitative data and expounded on the information		Y	
Managing flexworkers: Holding on and letting go	Richardson,Julia	Journal of Management Development	2010	What does it mean to be a manager of virtual workers?	• It is critical to maintain a balance between autonomy and team cohesion • Trust and team dynamics are also paramount	• A Case Study was conducted in Canada • Of the 138 employees who volunteered to participate, 78 interviews were conducted • Twenty-seven of those interviewed were managers • Interviews were transcribed, coded, and analyzed			Y
Overcoming barriers to knowledge sharing in virtual teams	Rosen,Benson; Furst,Stacie; Blackburn,Richard	Organizational dynamics	2007	What are the barriers to knowledge sharing within virtual teams?	Six common barriers to knowledge sharing in virtual teams were identified in 83% of responses: • lack of trust • time constraints • ineffective technology tools • ineffective team leaders • lack of building common team understanding • cultural constraints	• Online Survey and interviews conducted by the authors over the years of virtual employees and managers • Responses from 200 diverse participants were qualitative and coded to analyze results			Y
Predictors of the emergence of transformational leadership in virtual decision teams	Balthazard,Pierre A.; Waldman,David A.; Warren,John E.	The Leadership Quarterly	2009	What is the cause of transformational leadership within virtual teams?	• Personality may not influence the formation of transformational leadership perceptions • The quality of a leader's writing ability may favorably support a transformational leader's efforts	• Experiment with 262 students randomly assigned to virtual or face-to-face teams • Students all took a personality self-assessment • Teams were assigned a task • Evaluation of dynamics were analyzed by 14 undergraduate students	Y		

Title	Authors	Periodical or Type of Reference	Date	Primary Research Question	Findings/Outcomes	Methodology	Method		
							Mixed	Quantitative	Qualitative
Profiling virtual employees: The impact of managing virtually	Merriman,Kimberly K.; Schmidt,Stuart M.; Dunlap-Hinkler,Denise	Journal of Leadership & Organizational Studies	2007	What is the impact of managing virtually?	• Lower level of trust was reported in virtual teams versus those that are collocated • Lower level of trust was also reported among free-agents as opposed to a traditional employee	• Quantitative study of employees working in a variety of virtual and conventional settings • Respondents included 559 persons		Y	
Remote leadership, communication effectiveness and leader performance	Neufeld,Derrick J.; Wan,Zeying; Fang,Yulin	Group Decision and Negotiation	2010	How do leadership style, physical distance, and communications skills impact the perception of a leader's performance?	• High leader performance was more strongly related to transformational leadership as opposed to transactional leadership • Communications was also a predictor of leader performance	• The population for the survey was selected from respondents to a prescreening survey • A survey of 138 employees to analyze the level of each individual's followership		Y	
Research Note--A Model of Conflict, Leadership, and Performance in Virtual Teams	Wakefield,R. L.; Leidner,D. E.; Garrison,G.	Information Systems Research	2008	How does a manager effectively lead and manage conflict in a virtual environment?	• A manager may effectively assume a monitoring role in the use of communications technologies to reduce conflict • A manager must assume different roles to manage conflict – based on the composition of the team	• A quantitative survey was completed by 159 employees of a global firm with offices in the United States and Korea • The questionnaire measured conflict and effectiveness of leader and team performance		Y	
Strengthening Identification with the Team in Virtual Teams: The Leaders' Perspective	Sivunen,Anu	Group Decision and Negotiation	2006	How do team leaders unify the team and establish a connection between teammates?	• Four tactics key to success were identified o Catering for the individual o Positive feedback o Establishing common goals o Developing standard mode of operation for the team	• Four virtual team leaders from four international organizations were interviewed • Day-to-day communications of team leaders was observed • Text-based communications of the team leaders were evaluated • One of the team's discussion forum was analyzed • All data was coded, analyzed, and summarized			Y

Title	Authors	Periodical or Type of Reference	Date	Primary Research Question	Findings/Outcomes	Methodology	Method		
							Mixed	Quantitative	Qualitative
Subculture Formation, Evolution, and Conflict between Regional Teams in Virtual Organizations - Lessons Learned and Recommendations	Latapie,Hugo M.; Tran,Vu N.	Latapie,Hugo M.; Tran,Vu N.	2007	What is the impact of subculture formation and conflict in virtual teams?	• A virtual organization requires an active presence of organizational leadership – even more than a collocated team • Monitoring the cultural evolution across unique regional teams is important • It is the role of the leader to mold the team culture and resolve internal conflicts	• A Case Study of a team with offices in the UK and US • The team consisted of 78 members of which twenty were interviewed • Additional data collection included emails with interviewees, historical emails, exit interviews, and annual employee survey			Y
The challenges of managing cross-cultural virtual project teams	Oertig,Margaret; Buergi,Thomas	Team Performance Management	2006	What are the challenges of cross-cultural geographically dispersed project teams?	• Establishing effective leadership is key in a virtual environment • Managing the virtual aspects of communications is important • The development of trust is also important	• An inductive thematic analysis • Interviews were conducted at two sites (Switzerland and the United States) • Background interviews were conducted with three senior leaders • Seventeen interviews with project leaders/managers were conducted • Interviews were coded and analyzed for common themes			Y
The contingent effects of leadership on team collaboration in virtual teams	Huang,Rui; Kahai,Surinder; Jestice,Rebecca	Computers in Human Behavior	2010	What is the effect of transactional versus transformational leadership on virtual team performance?	• Transactional leadership improves task cohesion • Transformational leadership improves cooperation between team members • The improvement of cooperation levels serves to improve task cohesion and employee satisfaction • Transformational leadership improves productivity	• MIS undergraduates (455) were separated into virtual teams and not told who else was in their group • Participants were from the United States, South Korea, and China • The task assigned was an open-ended decision-making task and was short in duration		Y	

Title	Authors	Periodical or Type of Reference	Date	Primary Research Question	Findings/Outcomes	Methodology	Method		
							Mixed	Quantitative	Qualitative
The impact of team empowerment on virtual team performance: The moderating role of face-to-face interaction	Kirkman,B. L.; Rosen,B.; Tesluk,P. E.; Gibson,C. B.	The Academy of Management Journal	2004	What is the impact of face-to-face interaction upon virtual team performance and empowerment?	• Team empowerment was directly related to process improvement and customer satisfaction • The number of face-to-face meetings weakened the linkage between empowerment and process improvement	• Surveyed 35 sales and service virtual team members		Y	
The language of leaders: Identifying emergent leaders in global virtual teams	Simoff,Simeon J.;Sudweeks,Fay	Book, Section	2007	What are the patterns of communication that indicate the emergence of leaders in a virtual team environment?	• "Three criteria were added to the verbosity criteria to identify emergent leaders: number of utterances addressed to an individual, number of activity-related utterances sent by an individual, and number of activity-related utterances addressed to an individual. • In both case studies, a non-parametric technique and a visual cluttering procedure identified a small group of participants who emerged as leaders. The findings therefore suggest that frequency, density, content, and engagement level of communication contribute to identifying emergent leadership within virtual teams." (p. 109).	• Two case studies • The first tracked the activity level of 143 participants over two-years studying a group of people who were working on a collaborative research project who had never met online or offline • The second tracked 18 students engaged in collaborative learning over a 4 month period		Y	
The promise of virtual teams: identifying key factors in effectiveness and failure	Horwitz,Frank M.; Bravington,Desmond; Silvis,Ulrik	Journal of European Industrial Training	2006	What are the enabling and disenabling factors in the creation and operation of virtual teams?	The most important factors are: • Cross cultural communication • Goal and role clarification • Relationship building	• A questionnaire with both qualitative and quantitative questions was distributed to the researcher's contact databases and to email addresses obtained from internet newsgroups - 115 responded • The questionnaire focused on management and performance measures, team dynamics, and cross-cultural issues	Y		

Title	Authors	Periodical or Type of Reference	Date	Primary Research Question	Findings/Outcomes	Methodology	Method		
							Mixed	Quantitative	Qualitative
The Relative Importance of Leadership Behaviours in Virtual and Face-to-Face Communication Settings	Zimmermann,Peter; Wit,Arjaan; Gill,Roger	Leadership	2008	How does the virtual aspect of an individual team member affect the person's perception of leadership behaviors and communications?	• Clear communications is more difficult in a virtual environment • The amount of time a person operates in a virtual environment directly impacts how s/he places importance on specific leadership behaviors	• Surveyed 1500 employees at Shell GSI • Countries represented were the Netherland, the United States, The United Kingdom, Malaysia, and Germany.		Y	
The role of facility managers in the diffusion of organizational telecommuting	Karnowski,Sabine; White,Betty Jo	Environment and Behavior	2002	What is the role of a facility manager with respect to an organizations' telecommuting environment?	• Limited involvement in the corporate decision to adopt virtual work may constrain facility managers' effectiveness	• Two surveys were conducted to provide information about the telecommuting environment (Phase One) and facility managers' role (Phase Two) • Phase One survey was sent to 958 individuals resulting in 464 respondents of which only 87 were usable (organizations with a telecommuting program) • Phase Two survey provided demographic data on facility managers through the 87 respondents selected in Phase One		Y	
Toward a cultural contingency model of leadership	Muczyk,Jan P.; Holt,Daniel T.	Journal of Leadership & Organizational Studies	2008	How do we organize the Leadership Construct and what are the factors for a Global Contingency Model?	• Identified universal attributes that facilitate leadership effectiveness, impede effectiveness, and vary with culture • Simulating all factors may be overwhelming so it may be best to focus on the vital few • Developed a preliminary framework to be used in further study	• Leveraged quantitative data from Project GLOBE and Hofstede data and expounded on the information		Y	

Title	Authors	Periodical or Type of Reference	Date	Primary Research Question	Findings/Outcomes	Methodology	Method		
							Mixed	Quantitative	Qualitative
Transformational and transactional leadership in virtual and physical environments	Hoyt, Crystal L.;Blascovich,Jim	Small Group Research	2003	What is the impact on performance of leadership style (transformational versus transactional) in a variety of settings?	• Compared to transactional leadership, transformational leadership was associated with decreases in quantitative performance but increases in qualitative performance, leadership satisfaction, and group cohesiveness. • Contrary to expectations, neither self- nor collective efficacy mediated the performance effects of leadership; trusty, however appeared to play an important meditative role. Group performance and cohesiveness were similar across group settings; however group members were most satisfied with their leader when interacting face-to-face.	• 444 Introductory Psychology Students who were assigned to experimental teams that manipulated the variables.	Y		
Transformational leadership in context: Face-to-face and virtual teams	Purvanova,Radostina K.; Bono,Joyce E.	The Leadership Quarterly	2009	What is the impact of transformational leaders in either virtual or face-to-face teams?	• The effect of the performance of a team with transformational leadership was higher in virtual teams	• Experiment with 301 students randomly assigned to virtual or face-to-face teams • Teams were assigned a task • Evaluation of dynamics were analyzed by 14 undergraduate students			Y
Transformational leadership in distributed work groups: The moderating role of follower regulatory focus and goal orientation	Whitford,Tarli; Moss,Simon A.	Communication Research	2009	Are the benefits of transformational leadership realized in a virtual environment and what impact does regulatory focus or goal orientation limit the positive impact of transformational leadership?	• Only the core of a leader's messages are interpreted in a virtual work environment – detailed instructions are often overlooked • Many more correlations were analyzed and graphed	• A survey was conducted using the convenience and snowballing techniques to obtain participants • Respondents included 165 employees from many different organizations, 47% of whom worked in a location different than their manager • Respondents were mainly from Australia and included participation from six of the seven continents, excluding Antarctica		Y	

Title	Authors	Periodical or Type of Reference	Date	Primary Research Question	Findings/Outcomes	Methodology	Method		
							Mixed	Quantitative	Qualitative
Transformational leadership in virtual teams	Skattebo,M.	Dissertation/Thesis	2011	What are the roles of trust and empowerment within the leadership process of virtual team effectiveness as measured by performance and satisfaction?	• Trust was positively related to virtual team effectiveness • Trust did not mediate the relationship between transformational leadership behavior. • Empowerment was not significantly related to virtual team effectiveness. • Transformational leadership was found to be positively related to trust, empowerment, and effectiveness	• 29 teams comprised of 162 individuals in two larger multinational corporations comprising 22000 and 38000 employees worldwide were asked to participate • Respondents included 18 team leaders and 74 team members		Y	
Transformational leadership: An examination of cross-national differences and similarities	Boehnke,Karen; Bontis,Nick; DiStefano,Joseph J.; DiStefano,Andrea C.	Leadership & Organization Development Journal	2003	What are the cross-national differences or similarities key to understand when leading globally?	• The main leadership dimensions for success are universal – transformational leadership represented the clear majority • A few variations exist in six different regions in the world • Leadership differences were experienced in different parts of the same organization	• Leadership categories were derived from the Multifactor leadership questionnaire (MLQ) and Leadership Behavior Inventory (LBI) derived by Bass and Avolio • Two researchers analyzed 145 reports obtained from the same organization • Participants were global in nature and worked in five of the world's seven continents (excluding Africa and Antarctica)			Y

Title	Authors	Periodical or Type of Reference	Date	Primary Research Question	Findings/Outcomes	Methodology	Method		
							Mixed	Quantitative	Qualitative
Transforming global leadership: Applying the lessons learned from brazil, india, and nigeria toward the development of an integrated model of global	Lokkesmoe, K. J.	Book Section	2011	What are effective global leadership development strategies for people from developing countries? • What challenges do global leaders face when working internationally? • What competencies are essential to be an effective global leader? • What are the essential differences between global and local leadership?	• The author developed an Integrated Global Leadership Development Model. • Intercultural competence is a critical element of global leadership • Global leaders need to pay attention to local context • Global leadership varies in scope and magnitude from local leadership • Both challenges and rewards are intrinsic in global leadership • There were some results that varied by country, gender, age, experience. These included: o Results of comparisons between global and local leaders o The role of context in global leadership	• Preliminary survey to gather biographical and baseline data followed by interviews • Grounded theory research methods to identify patterns that emerged from the data • Fourteen participants with a minimum of one year in extensive global experiences in a range of industries • Constant comparative method was used to analyze the data and to code interview texts	Y		
Transplanting management: Participative change, organizational development, and the glocalization of corporate culture	Raz,Aviad E.	Journal of Applied Behavioral Science	2009	How does an organization establish a "workplace culture" that intercedes between global corporate and national culture?	• Working in a subsidiary may attract more independent employees who do not necessarily confirm to its national culture • Although Hofstede's cultural dimensions are important, quantitatively measuring culture has its challenges with interpretation • A model was developed for diagnosing cross-cultural organizational development and change that used as input global corporate and national culture to feed into workplace culture	• A naturalistic and qualitative mode of inquiry included a site visit and interviews of 21 employees of a South Korean subsidiary of an Israeli firm • As part of the study, organizational change seminars were conducted • Group interviews were conducted following the change seminar • Additional documents were analyzed, including company presentations, training materials			Y

Title	Authors	Periodical or Type of Reference	Date	Primary Research Question	Findings/Outcomes	Methodology	Method		
							Mixed	Quantitative	Qualitative
Understanding Conflict in Geographically Distributed Teams: The Moderating Effects of Shared Identity, Shared Context, and Spontaneous Communication	Hinds,Pamela J.;Mortensen,Mark	Organization science	2005	How does conflict play out in distributed and collocated teams?	• Distributed teams reported more task and interpersonal conflict • Shared identity moderated interpersonal conflict in distributed teams • Shared context moderated task conflict in distributed teams	• Mix of distributed teams (21) and collocated teams (22) from one multinational company • Web based survey followed by interviews	Y		
Virtual communication, transformation leadership, personality, and the apparent holographic constructs of implicit leadership	Salter, C., Green, M., Duncan, P. A., Berre, A., & Torti, C.	Book Section	2011	What degree to which followers' personality, as measured by the five-factor model of personality of Costa and McCrae (1988), is related to followers' ratings of the leader as a transformational leader, as assessed by the Multi-factor Leadership Questionnaire (MLQ-5X) published by Bass and Avolio (1994) in a virtual environmental setting.	• "Traditionally, charismatic leaders have built trust through face-to-face environments" (p. 180). • The authors reflect that there has been little research on how virtual communications affect the individual leader-follower relationship • "Regardless of whether the virtual environment is a business or educational institute, specific words or phrases to promote enthusiasm are necessary but are often absent" (p. 181). • Findings were summarized as: o Language is highly predictive of ratings of how transformational a leader is perceived to be, even when using virtual communications o Leaders change styles in order to better motivate their followers to higher productivity. o The most effective leaders should spend time assessing their followers' personality and perception of leadership effectiveness	• 306 university students (156 female & 150 male) • Two separate surveys were used and employed the Full Range Leadership Model, the Multi-factor Leadership Questionnaire MLQ-5X, and the Personality Item Pool (IPIP),			Y

Title	Authors	Periodical or Type of Reference	Date	Primary Research Question	Findings/Outcomes	Methodology	Method		
							Mixed	Quantitative	Qualitative
Virtual Distance (TM): A proposed model for the study of virtual work	Sobel Lojeski,K.	Dissertation/Thesis	2006	How does virtual work impact project success?	• A new index was derived to measure virtual distance. • Virtual distance may be high even in collocated teams. • Organizational culture differences along with national cultural differences affect decision making and performance. • Virtual teams often do not understand their mission. • Trust is negatively impacted by virtual distance.	• Executive Interviews • Quantitative Survey	Y		
Virtual Success The Keys to Effectiveness in Leading from a Distance	DeRosa,D.	Leadership in Action	2009	How can organizations ensure the success of virtual teams?	• Effective leadership is highly correlated to the success of a virtual team • Competencies of effective leaders are consistent across virtual and collocated teams • Virtual leaders experience similar barriers to their performance • Recommendations were made to overcome the challenges	• A study of forty-eight virtual teams within sixteen organizations were assessed in the areas of performance and leadership • Little additional data was provided about the methodology			Y
Virtual team collaboration: building shared meaning, resolving breakdowns and creating translucence	Bjorn,P.; Ngwenyama,O.	Information Systems Journal	2009	What are the possible communications breakdowns within teams and how are they impacted by the type of work environment or due to cultural differences	• Both teams experienced communications breakdowns, however those teams collocated with cultural differences are harder to resolve	• Case study of 2 culturally and geographically diverse teams performing similar tasks. • The first team only met in person at the project kick-off. The other team met periodically face-to-face.			Y

Title	Authors	Periodical or Type of Reference	Date	Primary Research Question	Findings/Outcomes	Methodology	Method		
							Mixed	Quantitative	Qualitative
Virtual team leadership: Perspectives from the field	Hambley,Laura A.; O'Neill,Thomas A.; Kline,Theresa J. B.	International Journal of e-Collaboration	2007	What are the important attributes or qualities that describe effective virtual team leadership?	• Virtual teams must be have a designated leader • Effective team meetings are critical • Teamwork must be personalized • Use of different communications media is important	• Detailed interviews with nine virtual leaders and their followers were conducted • Detailed notes were obtained from the interviews • Two independent raters evaluated the results of the interviews			Y
Virtual team leadership: The effects of leadership style and communication medium on team interaction styles and outcomes	Hambley,L. A.; O'Neill,T. A.; Kline,T. J. B.	Organizational behavior and human decision processes	2007	What is the effect of leadership style and communications on a virtual team's interaction and performance?	• Leadership style (transactional versus transformational) are equally effective in completing short duration projects • There is no difference in performance between teams using more advanced versus less advanced communications tools • A leader must establish effective communications to support collaboration and cohesion	• An experimental pilot study including 30 graduate and undergraduate students was used to test the tools and methods of the research • Research tools and methods were adjusted based on the results of the pilot and was repeated using 228 undergraduate students • Participants were assigned teams and tested six different conditions • A tool called Group Styles Inventory © was used to measure a team's interactive style • Other measures included team cohesion and task performance		Y	
Working in Pajamas: Telecommuting, Unfairness Sources, and Unfairness Perceptions	Thatcher,S.;Bagger,J.	Negotiation and Conflict Management Research	2011	Are coworkers seen as unfairness sources in the telecommuting context?	• The study identified the traditionally identified areas of discord between those who are teleworkers from those who are not, including the perception that their peer or subordinate is not pulling his/her weight. • It provides things for companies to be aware of if a telecommuting environment is introduced as well as the ongoing management of telecommuting.	• Analysis of interviews of employees within four telecommuting organizations. • 24 semi-structured interviews were done with telecommuters and their non-telecommuting peers and managers			Y

Title	Authors	Periodical or Type of Reference	Date	Primary Research Question	Findings/Outcomes	Methodology	Method		
							Mixed	Quantitative	Qualitative
Totals							**14**	**29**	**25**

Appendix C

Online Community Research

The number of virtual communities in the RCT space is limited; however, the Relational Cultural Theory (http://www.linkedin.com/groups?gid=3187346&trk=myg_ugrp_ovr) group has been established to provide connections between those involved in RCT outside of the therapy boundaries. This group is growing and attempting to reach across educational and professional bounds. The groups within the virtual work space are numerous and include both LinkedIn and independently hosted communities.

The Virtual Distance Institute (http://www.virtualdistanceinstitute.com) is a subscription membership that includes a wide range of resources focusing on the concept of Virtual Distance. There are currently 127 members of the institute representing a wide variety of organizations, including the World Economic Forum, Cigna, State Street Corporation, Siemens Canada Limited, and Inovati. Webinars are conducted on a monthly basis providing an opportunity to share concepts among the members.

The Telework Exchange (http://teleworkexchange.com) is a partnership between the government and private industry whose mission is to be a strong proponent of telework. Although the focus is mainly on government workers, it includes topics of interest for all who are interested in the success of virtual workers. Periodic conference calls discuss pertinent topics and Town Hall in-person meetings link managers and followers, sharing best practices. The group is open to all who register and appears to be widely accepted in the government sector.

The balances of the Internet sites are within the umbrella of LinkedIn. When I first conducted this research, some groups were initially blocked from view, requiring membership approval even to see the comments; however, all but the How We Work

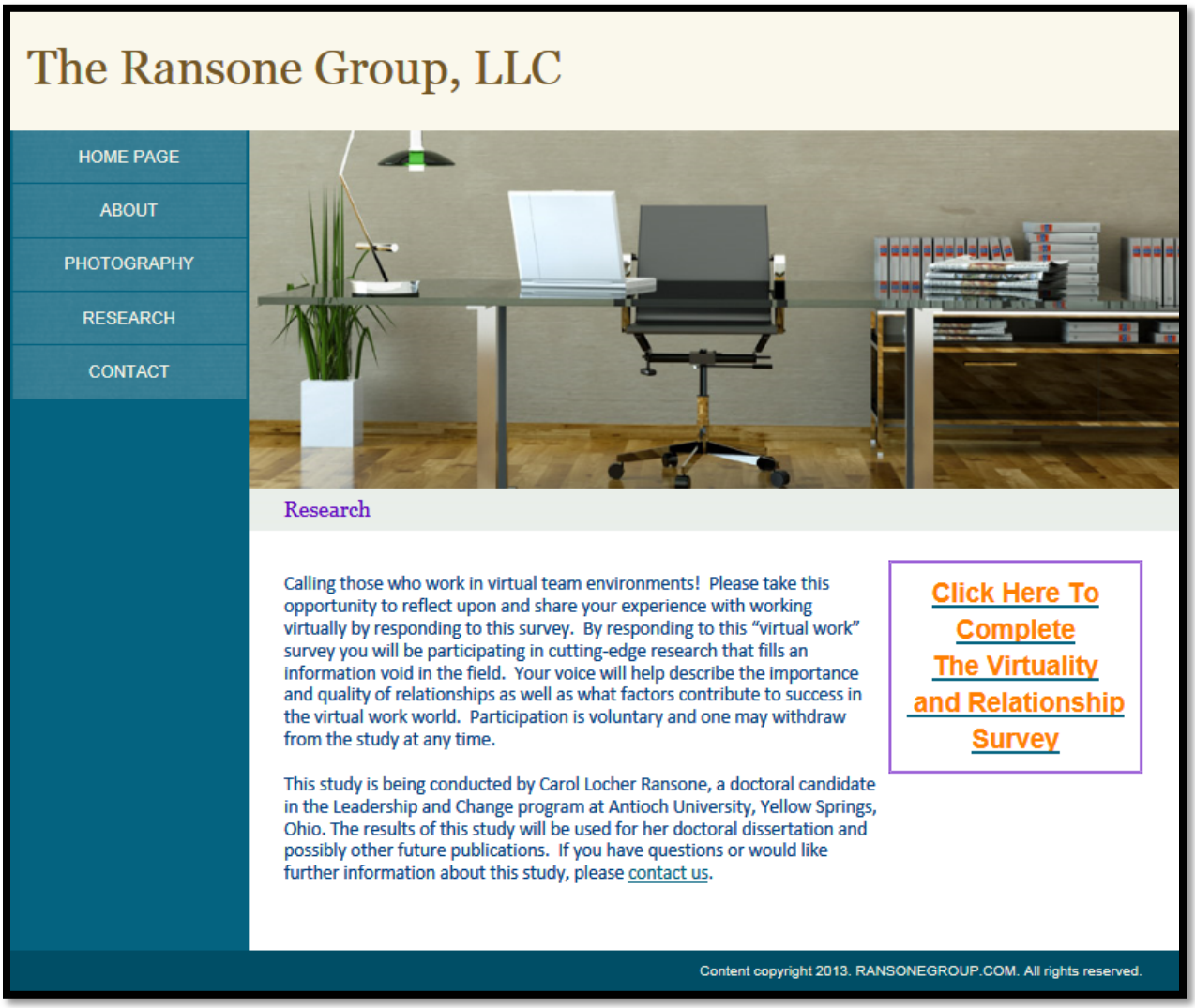
(http://www.linkedin.com/groups?home=&gid=4168848&trk=anet_ug_hm) have migrated to group structure such that all LinkedIn members may view comments and discussion threads. Membership is still required to post commentary. The organizational structure of LinkedIn uses one's existing LinkedIn profile and includes statistics and easy access for membership. As with any Internet site, one must be cautious about security and what group or members s/he is affiliated with. Many of the topics are interesting and warrant attention; however, some are more geared toward an attempt to drive business for their affiliated firms. Statistics are provided for every LinkedIn site providing a summary of activity and membership. eOffice – The Alternative Workspace (http://www.linkedin.com/groups/eOffice-553?home=&gid=553&trk=anet_ug_hm) is by far the largest membership group on LinkedIn with close to 33,000 members. The majority of the members are from the information technology and services sector. Comments and discussions have leveled off somewhat at a fairly low level; however, the topics are thought-provoking. As indicated earlier, the How We Work is a group within LinkedIn that permits only members to view any information about the group, including postings. An initial spike of membership produced the 140 members. The largest sector of membership is within architecture and planning. They have recently announced an in-person meeting to be held in in Atlanta in the fall of 2012. Comments and discussions mainly come from a small group of individuals; however the topics are current. The Workplace Community (http://www.linkedin.com/groups/Workplace-Community-101168?home=&gid=101168&trk=anet_ug_hm) consists of 210 members who are primarily management consultants. Membership has increased in recent months and the discussion activity has been consistent. The Virtual Team Builders (http://www.linkedin.com/groups/Virtual-Team-Builders-

1827535?home=&gid=1827535&trk=anet_ug_hm) group would appear to be very similar to The Workplace Community. It has 202 members and growth of membership has been consistent. In addition, discussion patterns are similar to those of The Workplace Community. Analysis of membership indicates some difference between the two as membership in the Virtual Team Builders group is primarily from the communications sector. A large percentage of their membership is from outside the United States which brings more of an international flavor. The administrator is very active in posting, sharing advice on how to effectively communicate with virtual teammates. The Virtual Teams group (http://www.linkedin.com/groups/Virtual-Teams-98605?home=&gid=98605&trk=anet_ug_hm) is the second largest in membership within the identified communities with 6401 members. Membership is primarily in the real estate sector and has had some spikes in membership increase in recent months. Discussion is consistently very active, including some who are requesting assistance with research. The connections that were established provided an initial point of reference to perform an in-depth review of literature.

Appendix D

Figure D.1

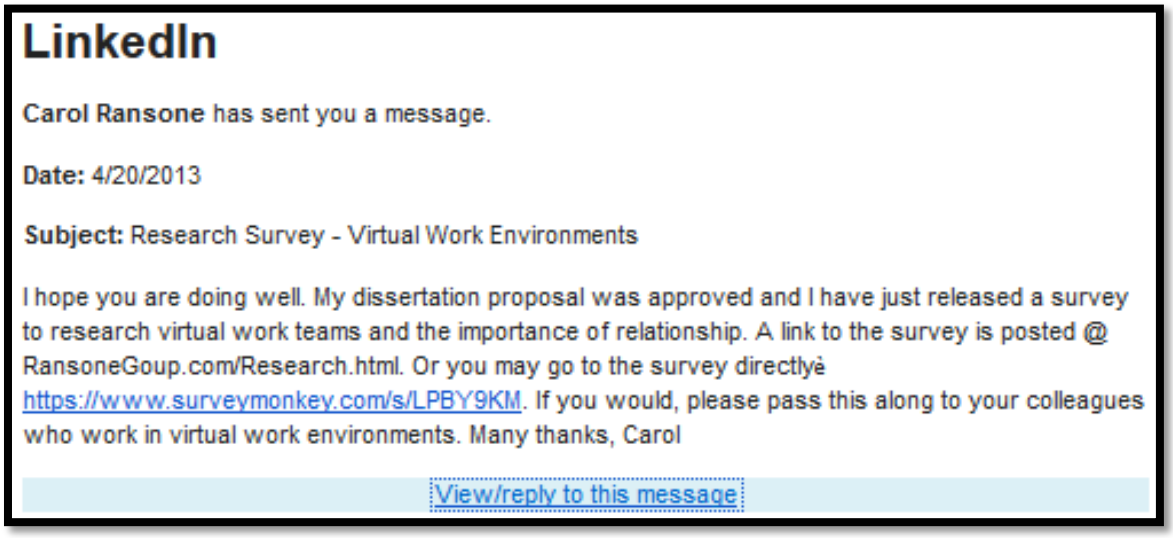
Web Hosting of Hyperlink to the Research Survey



Appendix E

Figure E.1

Example of Personal LinkedIn Message Inviting Survey Participation



LinkedIn

Carol Ransone has sent you a message.

Date: 4/20/2013

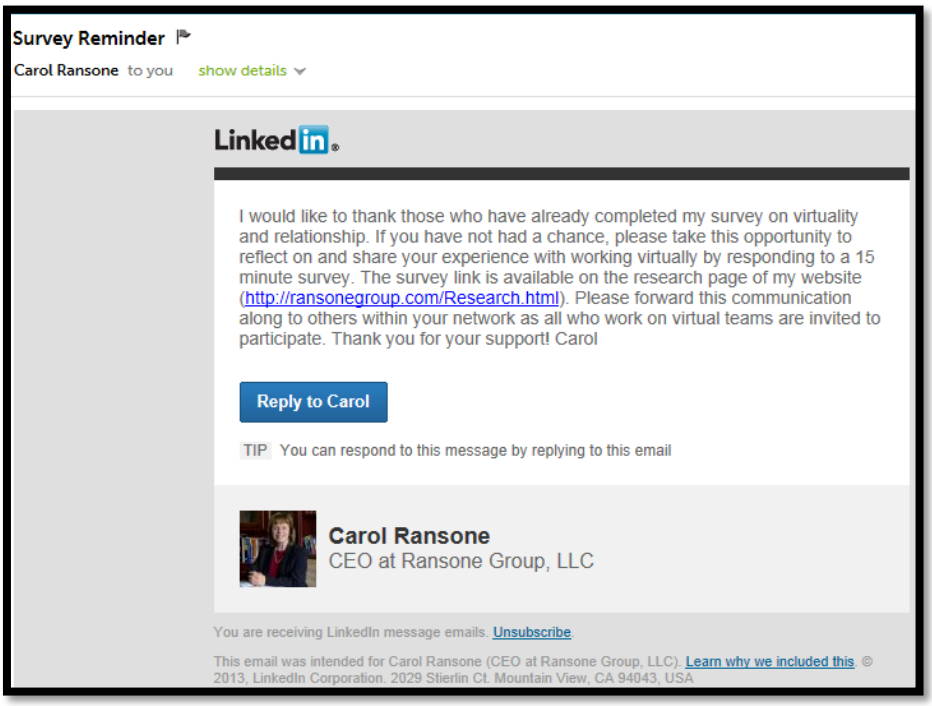
Subject: Research Survey - Virtual Work Environments

I hope you are doing well. My dissertation proposal was approved and I have just released a survey to research virtual work teams and the importance of relationship. A link to the survey is posted @ RansoneGoup.com/Research.html. Or you may go to the survey directlyè https://www.surveymonkey.com/s/LPBY9KM. If you would, please pass this along to your colleagues who work in virtual work environments. Many thanks, Carol

View/reply to this message

Figure E.2

Example of Survey Reminder Message Requesting Participation



Survey Reminder

Carol Ransone to you show details

LinkedIn

I would like to thank those who have already completed my survey on virtuality and relationship. If you have not had a chance, please take this opportunity to reflect on and share your experience with working virtually by responding to a 15 minute survey. The survey link is available on the research page of my website (http://ransonegroup.com/Research.html). Please forward this communication along to others within your network as all who work on virtual teams are invited to participate. Thank you for your support! Carol

Reply to Carol

TIP You can respond to this message by replying to this email

Carol Ransone
CEO at Ransone Group, LLC

You are receiving LinkedIn message emails. Unsubscribe.

This email was intended for Carol Ransone (CEO at Ransone Group, LLC). Learn why we included this. © 2013, LinkedIn Corporation. 2029 Stierlin Ct. Mountain View, CA 94043, USA

Figure E.3

LinkedIn Invitation Chosen as a Manager's Choice within a LinkedIn Community

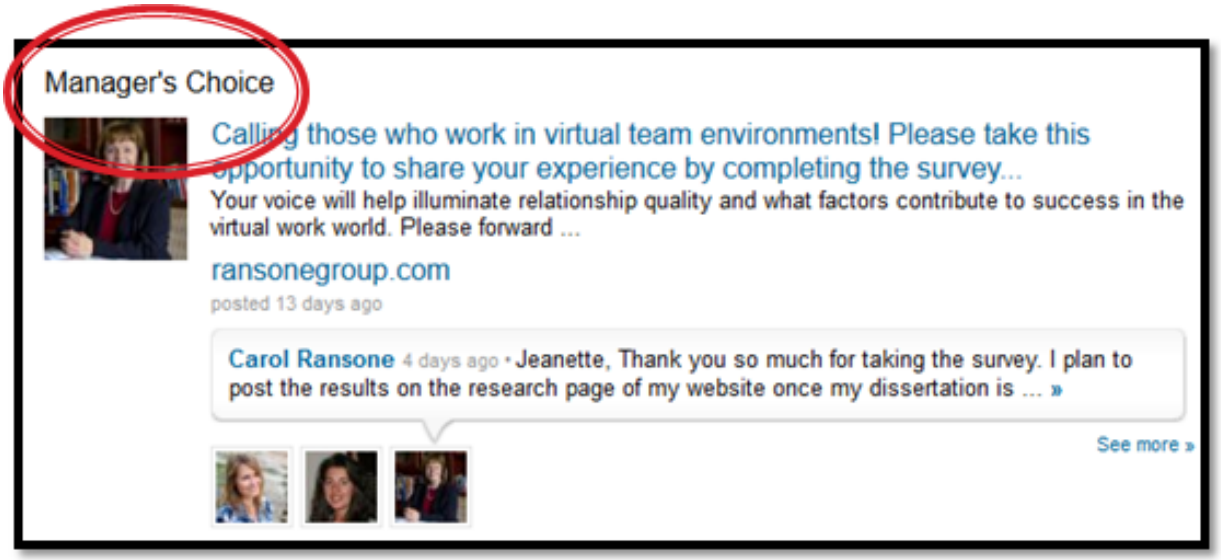


Figure E.4

LinkedIn Survey Invitation Being Shared and Commented Upon

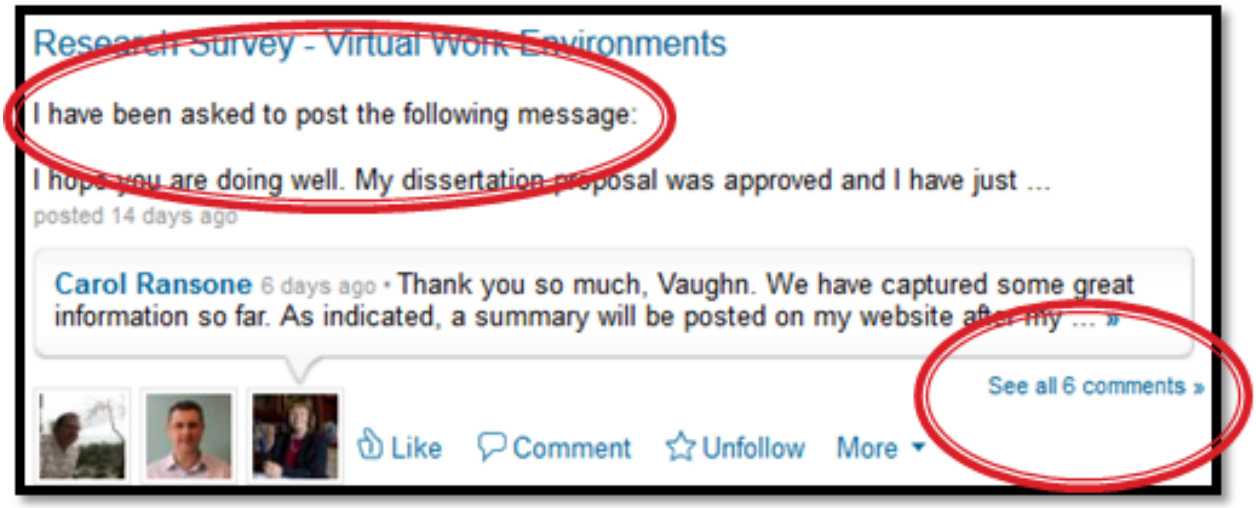
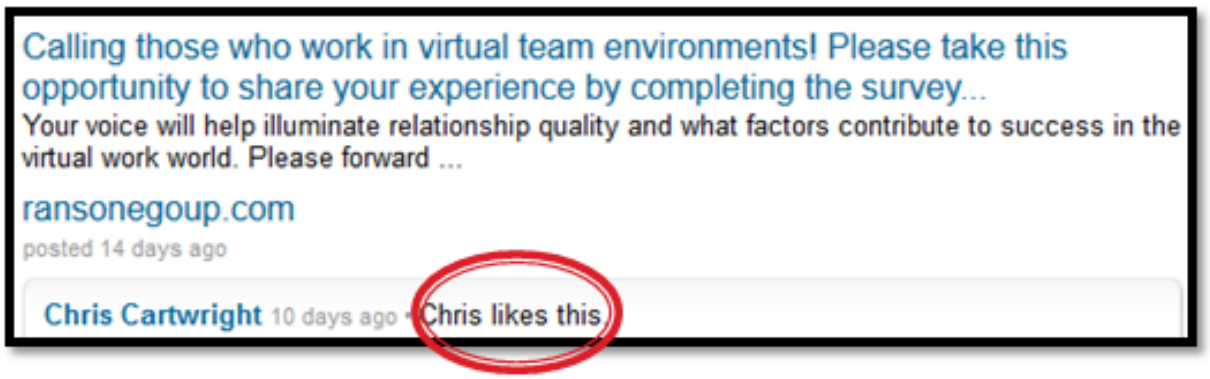


Figure E.4

LinkedIn Survey Invitation Being "Liked"



Appendix F

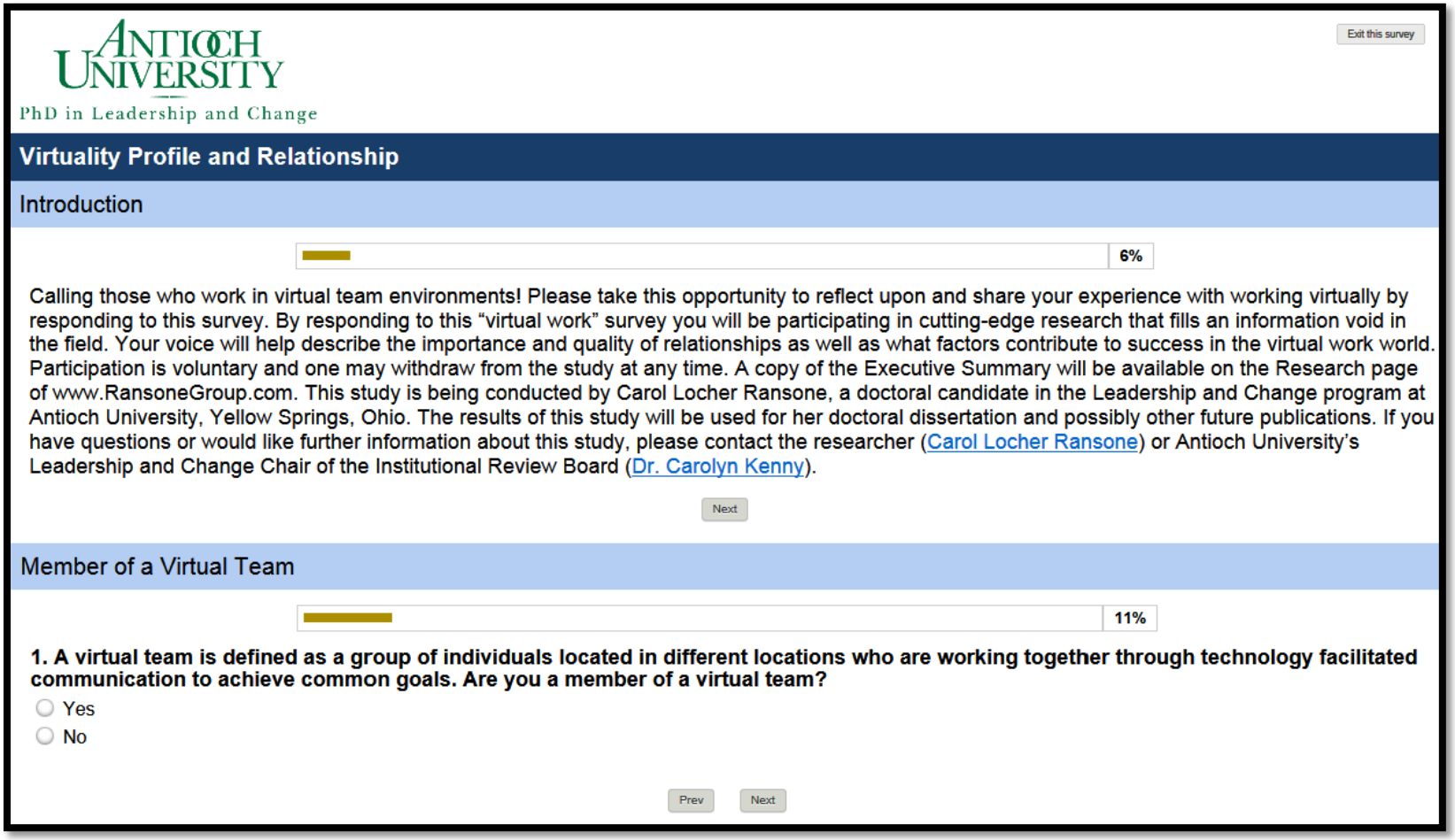
Figure F.1

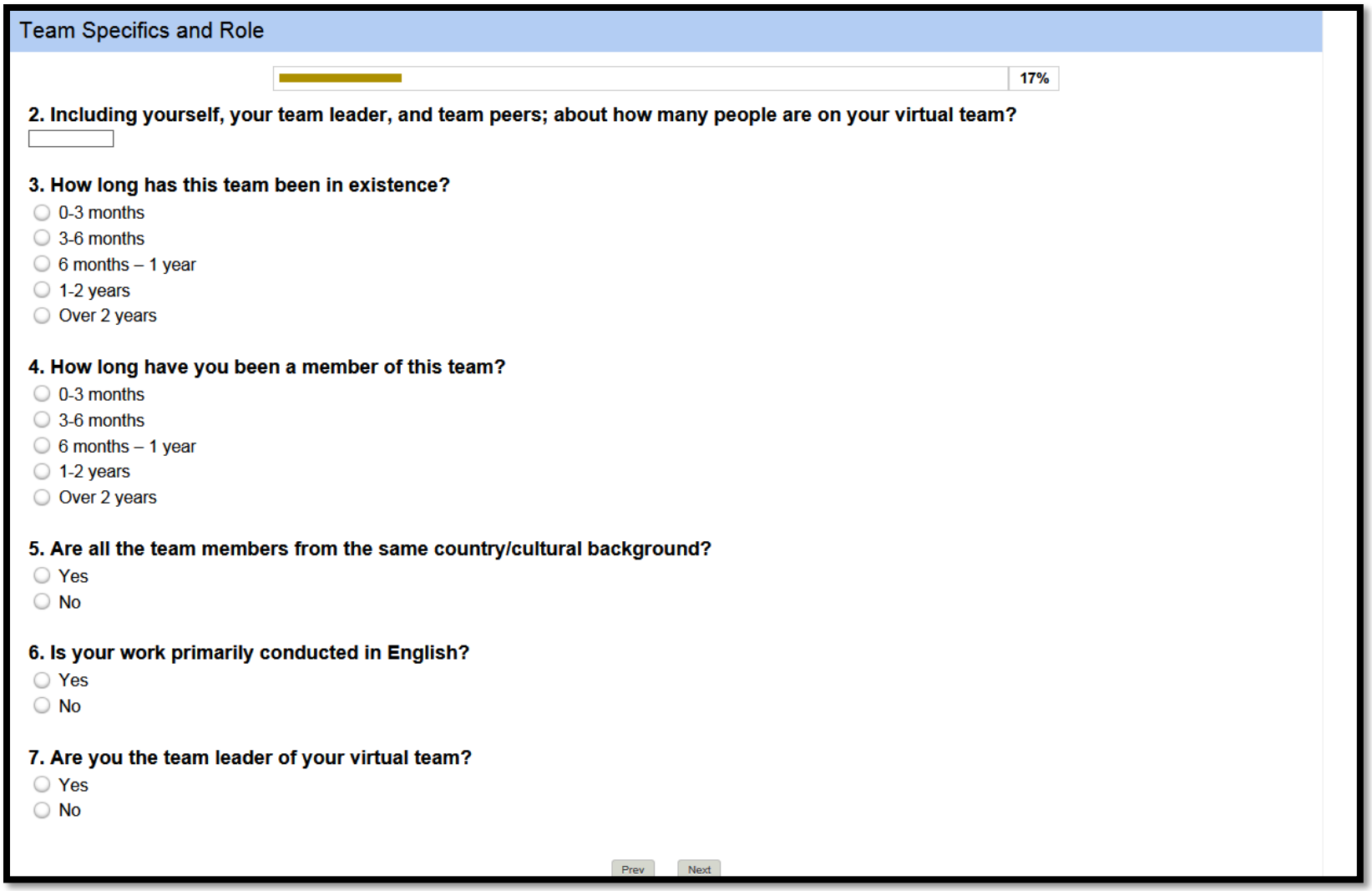
Business Cards to Solicit Participation in the Study

Appendix G

Figure G.1

Research Questions and Response Details





Team Specifics and Role

17%

2. Including yourself, your team leader, and team peers; about how many people are on your virtual team?

3. How long has this team been in existence?

- 0-3 months
- 3-6 months
- 6 months – 1 year
- 1-2 years
- Over 2 years

4. How long have you been a member of this team?

- 0-3 months
- 3-6 months
- 6 months – 1 year
- 1-2 years
- Over 2 years

5. Are all the team members from the same country/cultural background?

- Yes
- No

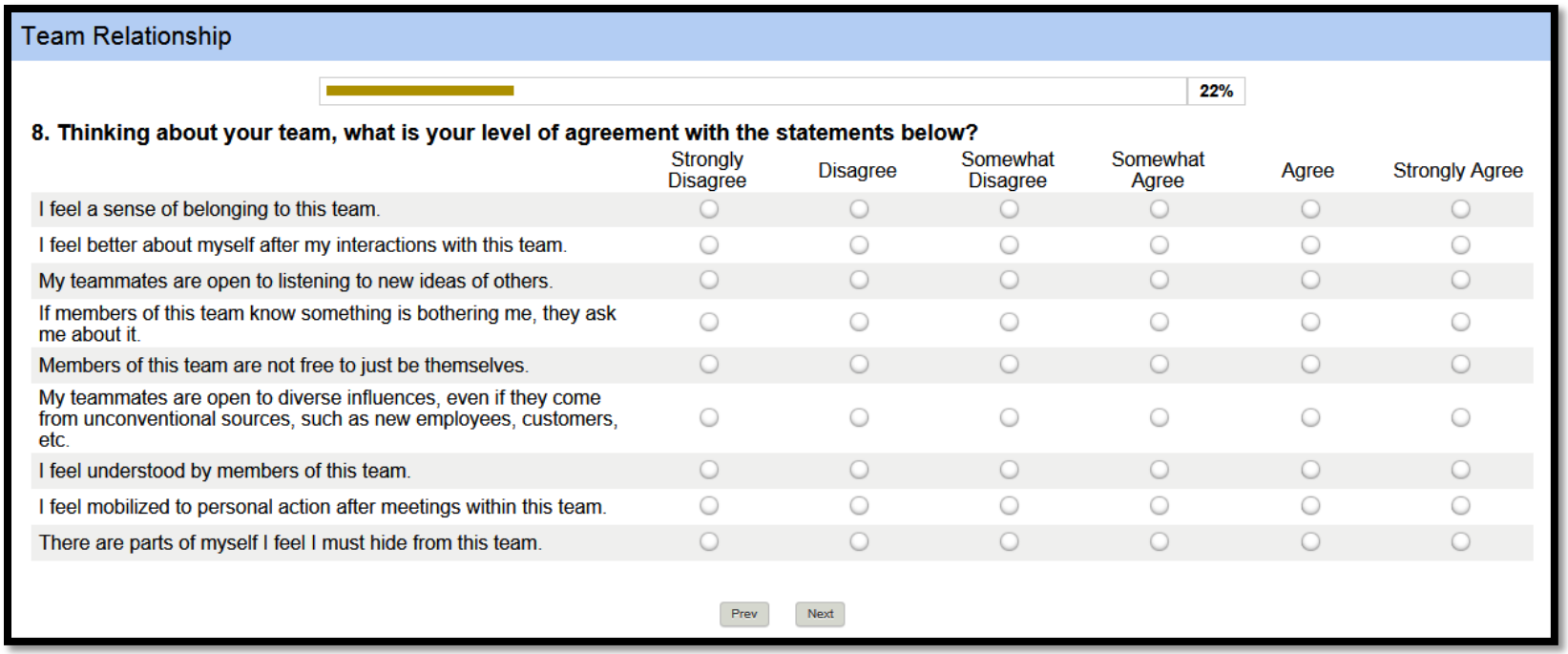
6. Is your work primarily conducted in English?

- Yes
- No

7. Are you the team leader of your virtual team?

- Yes
- No

Prev Next



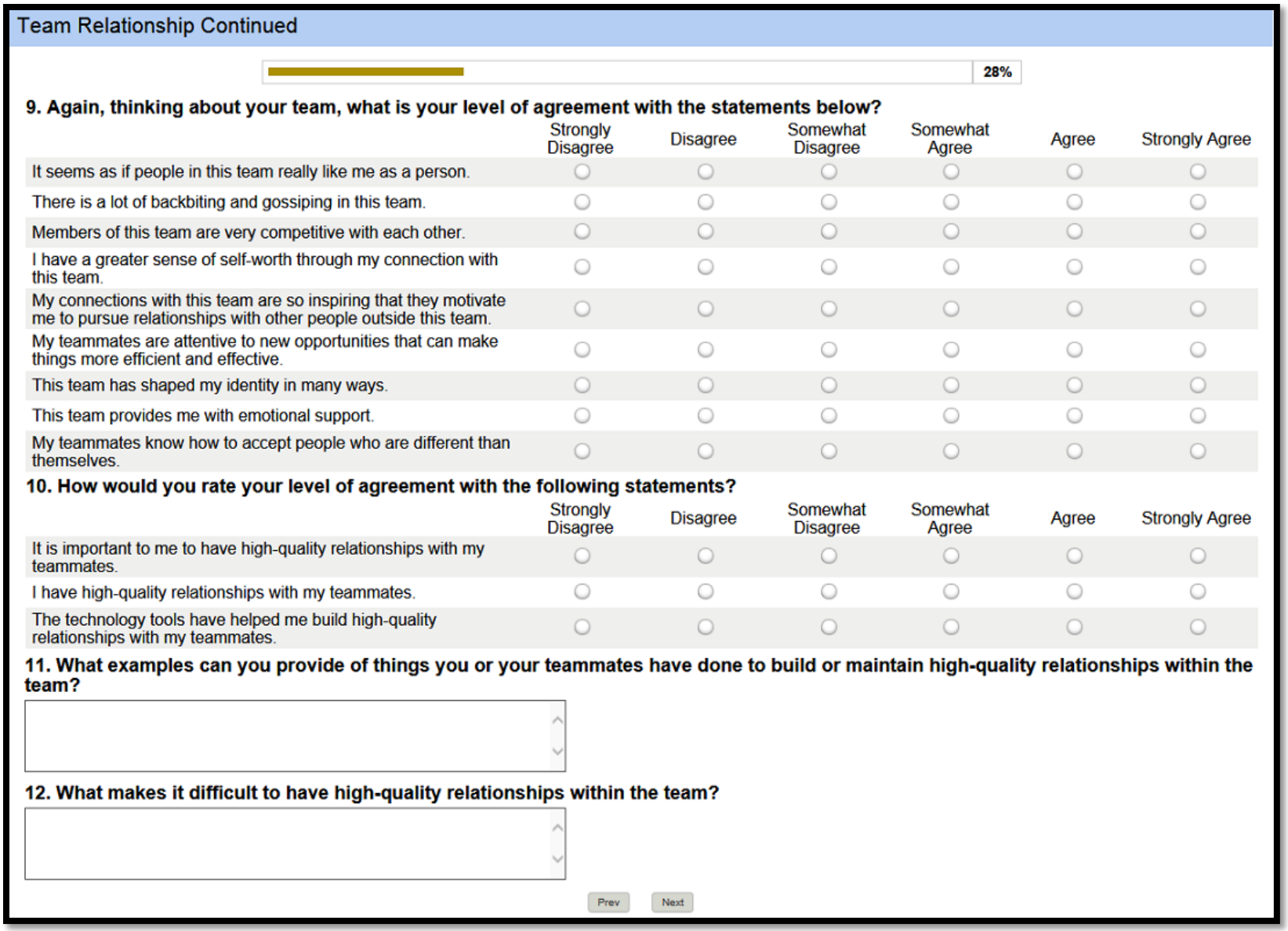
Team Relationship

22%

8. Thinking about your team, what is your level of agreement with the statements below?

	Strongly Disagree	Disagree	Somewhat Disagree	Somewhat Agree	Agree	Strongly Agree
I feel a sense of belonging to this team.	○	○	○	○	○	○
I feel better about myself after my interactions with this team.	○	○	○	○	○	○
My teammates are open to listening to new ideas of others.	○	○	○	○	○	○
If members of this team know something is bothering me, they ask me about it.	○	○	○	○	○	○
Members of this team are not free to just be themselves.	○	○	○	○	○	○
My teammates are open to diverse influences, even if they come from unconventional sources, such as new employees, customers, etc.	○	○	○	○	○	○
I feel understood by members of this team.	○	○	○	○	○	○
I feel mobilized to personal action after meetings within this team.	○	○	○	○	○	○
There are parts of myself I feel I must hide from this team.	○	○	○	○	○	○

Prev Next



Team Relationship Continued

28%

9. Again, thinking about your team, what is your level of agreement with the statements below?

	Strongly Disagree	Disagree	Somewhat Disagree	Somewhat Agree	Agree	Strongly Agree
It seems as if people in this team really like me as a person.	○	○	○	○	○	○
There is a lot of backbiting and gossiping in this team.	○	○	○	○	○	○
Members of this team are very competitive with each other.	○	○	○	○	○	○
I have a greater sense of self-worth through my connection with this team.	○	○	○	○	○	○
My connections with this team are so inspiring that they motivate me to pursue relationships with other people outside this team.	○	○	○	○	○	○
My teammates are attentive to new opportunities that can make things more efficient and effective.	○	○	○	○	○	○
This team has shaped my identity in many ways.	○	○	○	○	○	○
This team provides me with emotional support.	○	○	○	○	○	○
My teammates know how to accept people who are different than themselves.	○	○	○	○	○	○

10. How would you rate your level of agreement with the following statements?

	Strongly Disagree	Disagree	Somewhat Disagree	Somewhat Agree	Agree	Strongly Agree
It is important to me to have high-quality relationships with my teammates.	○	○	○	○	○	○
I have high-quality relationships with my teammates.	○	○	○	○	○	○
The technology tools have helped me build high-quality relationships with my teammates.	○	○	○	○	○	○

11. What examples can you provide of things you or your teammates have done to build or maintain high-quality relationships within the team?

12. What makes it difficult to have high-quality relationships within the team?

Prev Next

Virtual Profile: Geographic

33%

A primary work location is the the place from which one normally performs his/her job.

13. What best describes your primary work location?

- Assigned workspace in an office building (space is assigned to me)
- Shared workspace in an office building (workspace is shared with one or more teammates)
- Unassigned workspace in an office building (workspace available for use by all on a short-term or drop-in basis)
- Flexible work center (a building or floor that is share among a variety of teams within my organization)
- Workspace at a another organization with whom my team partners
- Temporary or rented space that is not managed within my organization
- Home office
- Other (please specify)

14. What best describes the primary work location of your teammates? They are:

- in the same building or complex.
- not in the same building / complex but in the same local geographic area.
- not in the same local geographic area but in the same country and time zone.
- not in the same local geographic area but in the same country but different time zones.
- not in the same time zone but within the same country.
- in different countries all within the same time zone.
- in different countries and different time zones.

15. What best describes the primary work locations of your teammates:

- All teammates work from different primary work locations.
- Most teammates work from different primary work locations.
- There are a few locations in which most teammates work and others are distributed.
- There is one location in which most teammates work and others are distributed.

15. What best describes the primary work locations of your teammates:

- ○ All teammates work from different primary work locations.
- ○ Most teammates work from different primary work locations.
- ○ There are a few locations in which most teammates work and others are distributed.
- ○ There is one location in which most teammates work and others are distributed.

16. What best describes where you work in relation to your teammates?

- ○ There are no other teammates at my primary work location.
- ○ I work from a location where a few of my teammates are located.
- ○ I work from a location where most of my teammates are located.

17. One way to think about how virtual a team is may be related to geographic dispersion.

Reflecting on your team's geographic dispersion, how "virtual" would you rate your team?

1 Not at all Virtual	2	3	4	5	6	7	8	9	10 Extremely Virtual
○	○	○	○	○	○	○	○	○	○

Prev Next

Virtual Profile: Interaction

39%

18. On average, how many times do you have meetings where:

	Daily	A Few Times a Week	A Few Times Per Month	Monthly	Several Times Per Year	Once Per Year	None
none of the attendees are in person (face-to-face)?	○	○	○	○	○	○	○
only a few attendees are in person (face-to-face)?	○	○	○	○	○	○	○
most attendees are in person (face-to-face)?	○	○	○	○	○	○	○
all attendees are in person (face-to-face)?	○	○	○	○	○	○	○

19. How would you rate your level of agreement with the following statements? Our team successfully holds meetings where:

	Strongly Disagree	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree	Strongly Agree	Does not Occur
Some are in-person and some use audio conferencing (Teleconference, bridge line, etc.).	○	○	○	○	○	○	○	○
Some are in person and some use video conferencing (TelePresence, Skype, Go to Meeting, etc.).	○	○	○	○	○	○	○	○
Some are in-person, some use audio, and some use video conferencing.	○	○	○	○	○	○	○	○

20. On average, what percentage of your time do you spend (the total of time should add to 100):

doing individual work?	
communicating virtually with other persons using technology (i.e. email, phone, chat)?	
meeting face-to-face (in person)?	
other?	

21. If you selected "other" in the previous question, what best describes that activity?

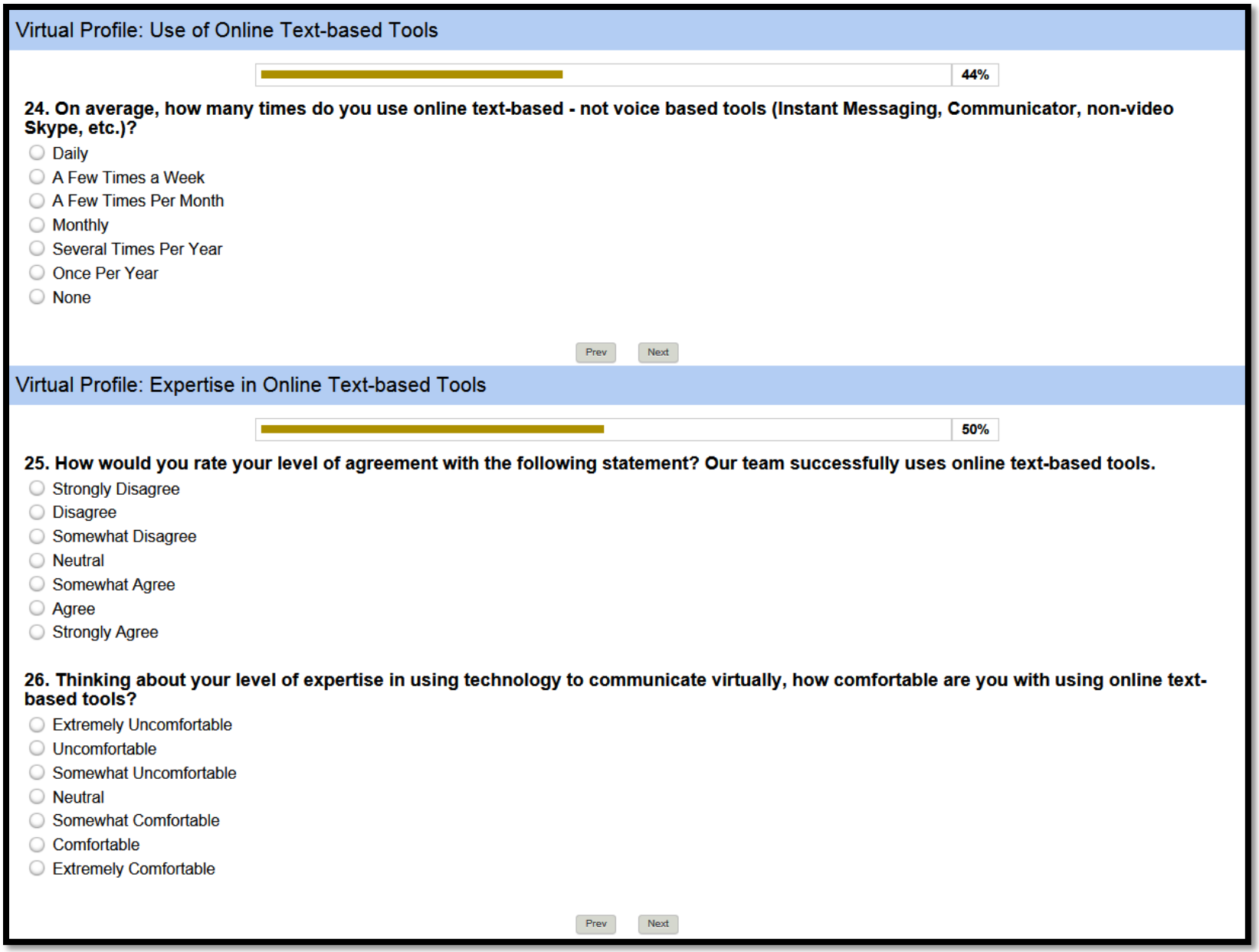
22. What routines does your team use to stay connected?

23. One way to think about how virtual a team is may be related to how the team interacts with each other.

Reflecting on how your team interacts, how "virtual" would you rate your team?

1 Not at all Virtual	2	3	4	5	6	7	8	9	10 Extremely Virtual
○	○	○	○	○	○	○	○	○	○

Prev Next



Virtual Profile: Use of Online Text-based Tools

44%

24. On average, how many times do you use online text-based - not voice based tools (Instant Messaging, Communicator, non-video Skype, etc.)?

- Daily
- A Few Times a Week
- A Few Times Per Month
- Monthly
- Several Times Per Year
- Once Per Year
- None

Prev Next

Virtual Profile: Expertise in Online Text-based Tools

50%

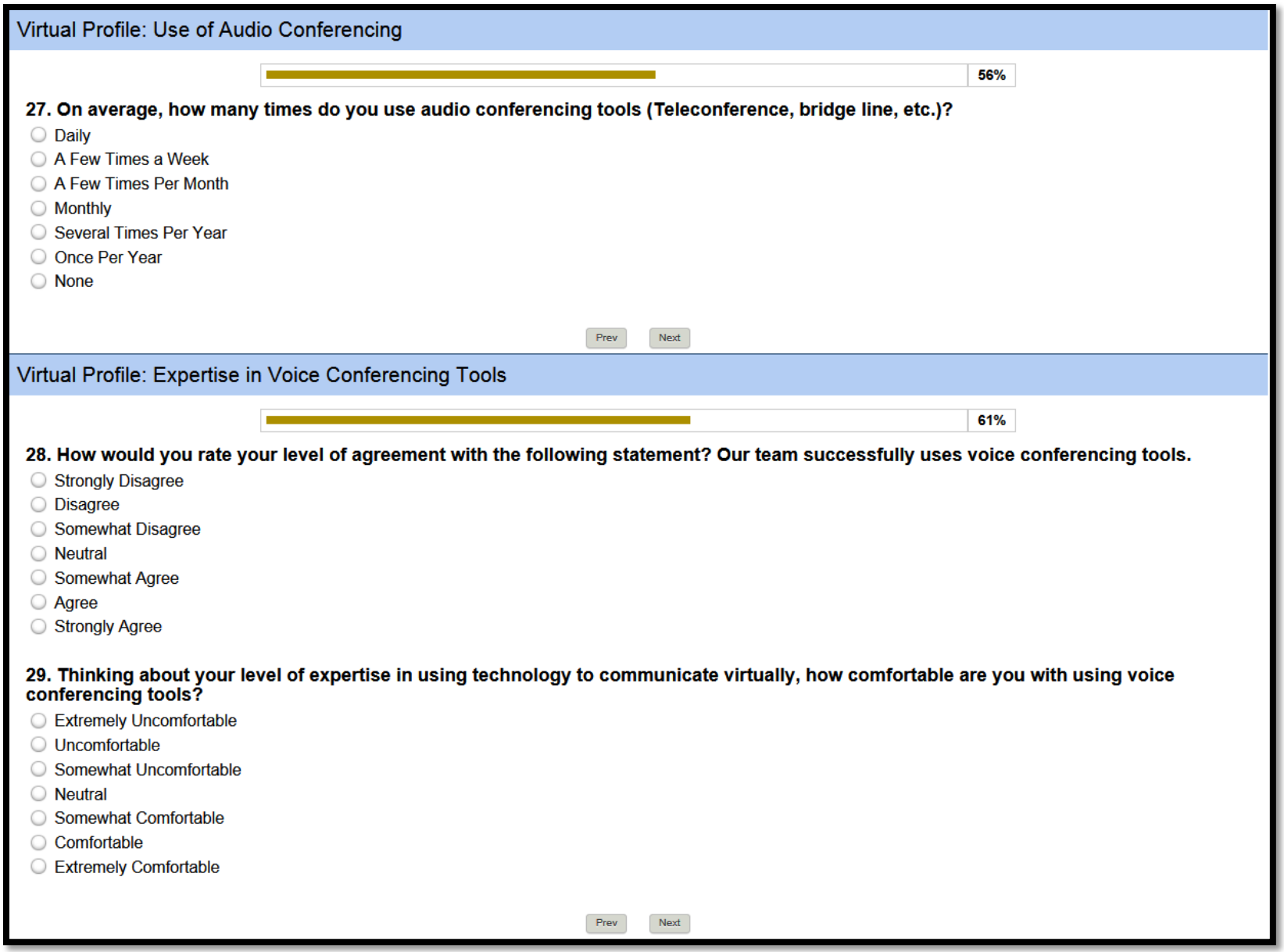
25. How would you rate your level of agreement with the following statement? Our team successfully uses online text-based tools.

- Strongly Disagree
- Disagree
- Somewhat Disagree
- Neutral
- Somewhat Agree
- Agree
- Strongly Agree

26. Thinking about your level of expertise in using technology to communicate virtually, how comfortable are you with using online text-based tools?

- Extremely Uncomfortable
- Uncomfortable
- Somewhat Uncomfortable
- Neutral
- Somewhat Comfortable
- Comfortable
- Extremely Comfortable

Prev Next



Virtual Profile: Use of Audio Conferencing

56%

27. On average, how many times do you use audio conferencing tools (Teleconference, bridge line, etc.)?

- Daily
- A Few Times a Week
- A Few Times Per Month
- Monthly
- Several Times Per Year
- Once Per Year
- None

Prev Next

Virtual Profile: Expertise in Voice Conferencing Tools

61%

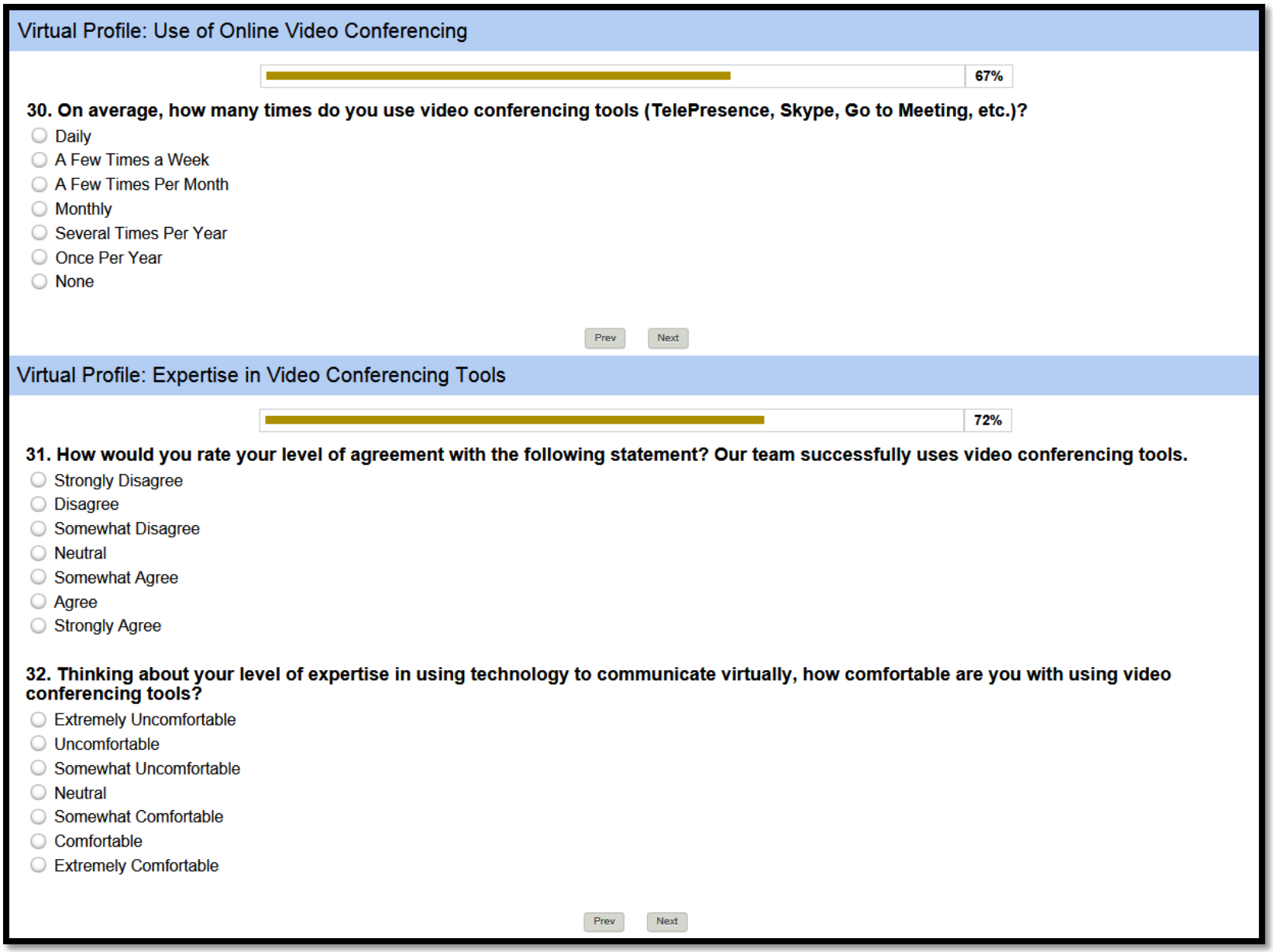
28. How would you rate your level of agreement with the following statement? Our team successfully uses voice conferencing tools.

- Strongly Disagree
- Disagree
- Somewhat Disagree
- Neutral
- Somewhat Agree
- Agree
- Strongly Agree

29. Thinking about your level of expertise in using technology to communicate virtually, how comfortable are you with using voice conferencing tools?

- Extremely Uncomfortable
- Uncomfortable
- Somewhat Uncomfortable
- Neutral
- Somewhat Comfortable
- Comfortable
- Extremely Comfortable

Prev Next



Virtual Profile: Use of Online Video Conferencing

67%

30. On average, how many times do you use video conferencing tools (TelePresence, Skype, Go to Meeting, etc.)?

- Daily
- A Few Times a Week
- A Few Times Per Month
- Monthly
- Several Times Per Year
- Once Per Year
- None

Prev Next

Virtual Profile: Expertise in Video Conferencing Tools

72%

31. How would you rate your level of agreement with the following statement? Our team successfully uses video conferencing tools.

- Strongly Disagree
- Disagree
- Somewhat Disagree
- Neutral
- Somewhat Agree
- Agree
- Strongly Agree

32. Thinking about your level of expertise in using technology to communicate virtually, how comfortable are you with using video conferencing tools?

- Extremely Uncomfortable
- Uncomfortable
- Somewhat Uncomfortable
- Neutral
- Somewhat Comfortable
- Comfortable
- Extremely Comfortable

Prev Next

Summary

78%

33. One way to measure how virtual a team is may be related to their use of technology tools.

Reflecting on how your team uses technology tools, how "virtual" would you rate your team?

1 Not at all Virtual	2	3	4	5	6	7	8	9	10 Extremely Virtual
○	○	○	○	○	○	○	○	○	○

34. A virtual team is defined as a group of individuals who are in different locations and who work together through technology facilitated communication to achieve common goals.

Reflecting on this definition, how "virtual" would you rate your team overall?

1 Not at all Virtual	2	3	4	5	6	7	8	9	10 Extremely Virtual
○	○	○	○	○	○	○	○	○	○

35. What comments do you have about your team's level of virtuality?

36. How would you rate your level of agreement with the following statements?

	1 Strongly Disagree	2	3	4	5	6	7	8	9	10 Strongly Agree
My team achieves its' goals.	○	○	○	○	○	○	○	○	○	○
I am satisfied with my job.	○	○	○	○	○	○	○	○	○	○
I am satisfied with the relationships we have in our team.	○	○	○	○	○	○	○	○	○	○

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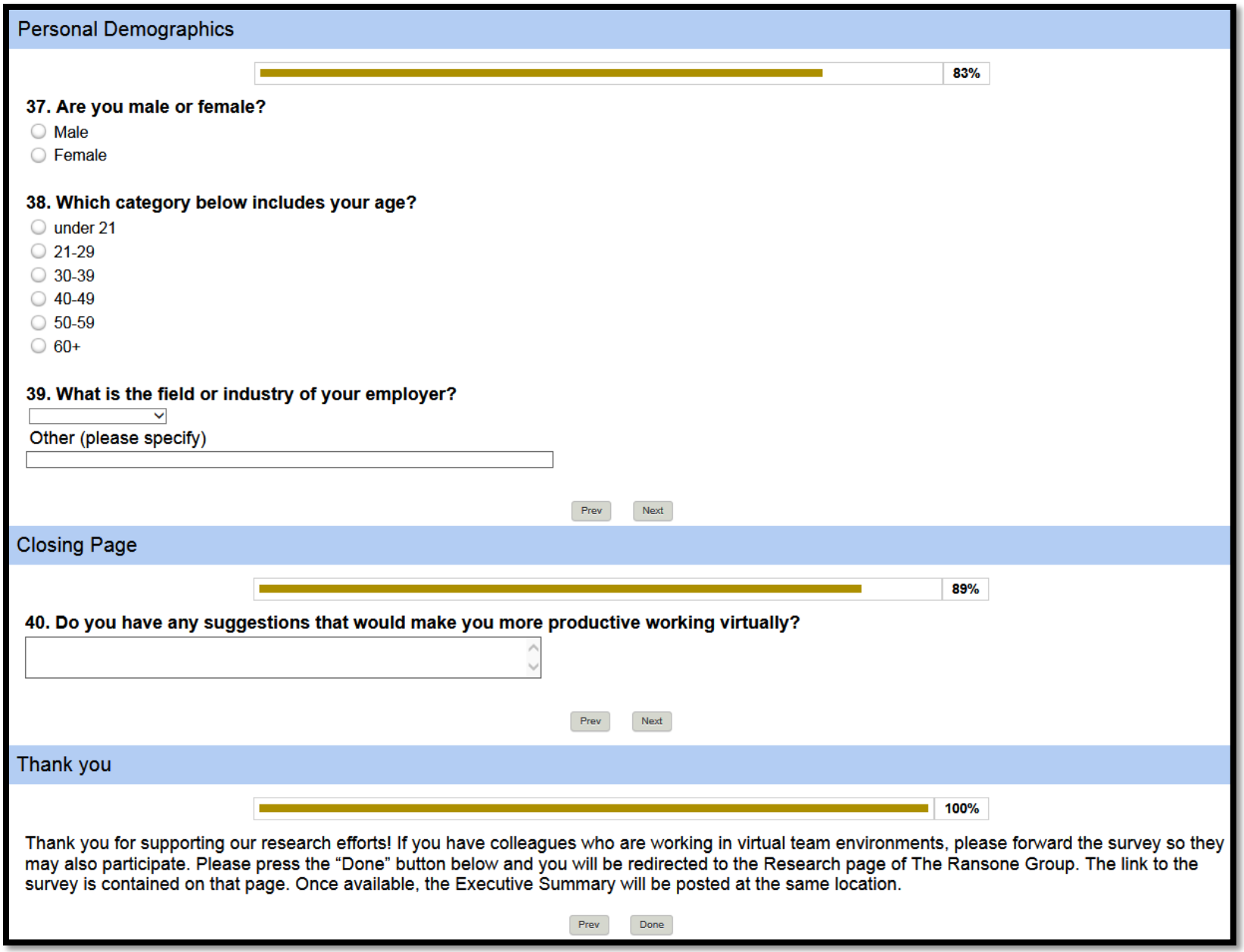


Personal Demographics

83%

37. Are you male or female?

- Male
- Female

38. Which category below includes your age?

- under 21
- 21-29
- 30-39
- 40-49
- 50-59
- 60+

39. What is the field or industry of your employer?

Other (please specify)

Prev Next

Closing Page

89%

40. Do you have any suggestions that would make you more productive working virtually?

Prev Next

Thank you

100%

Thank you for supporting our research efforts! If you have colleagues who are working in virtual team environments, please forward the survey so they may also participate. Please press the "Done" button below and you will be redirected to the Research page of The Ransone Group. The link to the survey is contained on that page. Once available, the Executive Summary will be posted at the same location.

Prev Done

The drop-down values for the field or industry of your employer (question 39) were:

- Architecture
- Arts/Entertainment
- Education
- Energy/Utilities
- Financial Services
- Government
- Healthcare
- Human Resources
- Human Services
- Insurance
- Legal
- Manufacturing
- Marketing
- Media
- Military
- Non-profit Associations
- Pharmaceuticals
- Real Estate
- Religious Institutions
- Retail/Sales
- Technology
- Telecommunications
- Travel

Appendix H

Table H.1

Original and Final Wording of RHI and Connectivity Items

Original Wording of Items	Wording Utilized in this Study	Wording Changes Description
RHI-Authenticity*		
Members of this community are not free to just be themselves.	Members of this team are not free to just be themselves.	• "community" to "team"
There are parts of myself I feel I must hide from this community.	There are parts of myself I feel I must hide from this team.	• "community" to "team"
There is a lot of backbiting and gossiping in this community.	There is a lot of backbiting and gossiping in this team.	• "community" to "team"
Members of this community are very competitive with each other.	Members of this team are very competitive with each other.	• "community" to "team"
RHI-Engagement		
I feel a sense of belonging to this community.	I feel a sense of belonging to this team.	• "community" to "team"
If members of this community know something is bothering me, they ask me about it.	If members of this team know something is bothering me, they ask me about it.	• "community" to "team"
I feel understood by members of this community.	I feel understood by members of this team.	• "community" to "team"
It seems as if people in this community really like me as a person.	It seems as if people in this team really like me as a person.	• "community" to "team"
This community provides me with emotional support.	This team provides me with emotional support.	• "community" to "team"
RHI-Empowerment		
I feel better about myself after my interactions with this community.	I feel better about myself after my interactions with this team.	• "community" to "team"
I feel mobilized to personal action after meetings within this community.	I feel mobilized to personal action after meetings within this team.	• "community" to "team"

Original Wording of Items	Wording Utilized in this Study	Wording Changes Description
I have a greater sense of self-worth through my connection with this community.	I have a greater sense of self-worth through my connection with this team.	• "community" to "team"
My connections with this community are so inspiring that they motivate me to pursue relationships with other people outside this community.	My connections with this team are so inspiring that they motivate me to pursue relationships with other people outside this team.	• "community" to "team"
This community has shaped my identity in many ways.	This team has shaped my identity in many ways.	• "community" to "team"
Carmeli et al. (2009) Connectivity		
We are always open to listening to our co-workers' new ideas	My teammates are open to listening to new ideas of others.	• "we" to "my teammates" • Removed "always"
We are very open to diverse influences, even if they come from unconventional sources, such as new employees, customers, etc.	My teammates are open to diverse influences, even if they come from unconventional sources, such as new employees, customers, etc.	• "we" to "my teammates" • Removed "very"
We are attentive to new opportunities that can make our system more efficient and effective	My teammates are attentive to new opportunities that can make things more efficient and effective.	• "we" to "my teammates"
We know how to accept people who are different	My teammates know how to accept people who are different than themselves.	• "we" to "my teammates" • Added of "than themselves"

Note. *The four authenticity component measures were reverse scored to align with the responses within the other components.

Appendix I

Table I.1

Matrix of Research Questions, Variables, and Analysis

Research Question	Variables	Analysis
Research Question 1: What is the profile of a virtual worker in terms of demographics, virtuality, relationship, and perceived success?	Virtuality variables • Perception of virtuality rating variables • Detailed virtuality questions Relationship variables • RHI-Community and Connectivity items to develop RHI-TEAM$_W$ • Perception of relationship rating variables Perception of successful outcomes variables Demographics (team and personal)	DESCRIPTIVE • Percentage distributions • Mean scores • Standard deviations • Skewness • Kurtosis PRINCIPAL COMPONENT ANALYSIS • Factor loading

Research Question	Variables	Analysis
Research Question 2: How important is it to virtual workers to experience high-quality relationships in a virtual work environment and how does it align to their perception of relationship?	Importance of high-quality relationships Perception high-quality relationships exist Demographics (team and personal)	DESCRIPTIVE • Percentage distributions • Mean scores • Standard deviations CORRELATIONAL (analyzing demographic differences) • Importance of high-quality relationships • Existence of high-quality relationships between team member and team leader • Difference between importance and existence of high-quality relationships
Research Question 3: What is the correlation between perception of relationship quality and relationship as measured by the Relational Health Indices and the Connectivity component?	Demographic to separate based on Position in Team • RHI-TEAM$_W$ components • Perception high-quality relationships exist	BIVARIATE CORRELATIONAL • RHI-TEAM$_W$ components • Perception high-quality relationships exist

Research Question	Variables	Analysis
Research Question 4: What factors influence success in a virtual work environment?	Virtuality variables • Perception of virtuality rating variables • Detailed virtuality questions Relationship variables • RHI-TEAM$_W$ • Perception of relationship rating variables Perception of successful outcomes variables Demographics (team and personal)	MULTIVARIATE CORRELATIONAL Regression analyses with one model for each perceived success measure • Independent variables o Control: Demographic variables o Mediating: Virtuality variables o Research question: Relationship variables • Dependent variable: Perception of Success variables
Research Question 5: What suggestions do virtual workers have for building and maintaining high-quality relationships or to improve productivity?	Commentary on: • Building / maintaining high-quality relationships • Routines / tools • Suggestions to improve productivity	DESCRIPTIVE • Thematic analysis of text

Appendix J

Table J.1: Virtuality Item Details

Virtuality Profile: Geographic							
What best describes your primary work location?	Assigned workspace in an office building (space is assigned to me)	Shared workspace in an office building (workspace is shared with one or more teammates)	Unassigned workspace in an office building (workspace available for use by all on a short-term or drop-in basis)	Flexible work center (a building or floor that is share among a variety of teams within my organization)	Workspace at a another organization with whom my team partners	A variety of locations, including home, client site, office space	Home office
	34.0%	4.3%	2.3%	2.3%	1.2%	0.4%	55.5%
What best describes the primary work location of your teammates? They are:	in the same building or complex.	not in the same building / complex but in the same local geographic area.	not in the same local geographic area but in the same country and time zone.	not in the same local geographic area but in the same country but different time zones.	not in the same time zone but within the same country.	in different countries all within the same time zone.	in different countries and different time zones.
	4.3%	7.4%	17.6%	26.6%	13.7%	0.8%	29.7%
Select what best describes the primary work locations of your teammates:	There is one location in which most teammates work and others are distributed.	There are a few locations in which most teammates work and others are distributed.	Most teammates work from different primary work locations.	All teammates work from different primary work locations.			
	9.48%	16.0%	33.2%	41.4%			
What best describes where you work in relation to your teammates?	I work from a location where most of my teammates are located.	I work from a location where a few of my teammates are located.	There are no other teammates at my primary work location.				
	8.2%	30.1%	61.7%				
N=256							

Virtuality Profile: Geographic Virtuality Profile: Interaction							
On average, how many times do you have meetings where:	None	Once Per Year	Several Times Per Year	Monthly	A Few Times Per Month	A Few Times a Week	Daily
• none of the attendees are in person (face-to-face)?	9.0%	2.0%	5.5%	5.5%	16.8%	25.8%	35.5%
• only a few attendees are in person (face-to-face)?	18.8%	5.9%	23.0%	10.5%	18.8%	16.8%	6.3%
On average, how many times do you have meetings where:	Daily	A Few Times a Week	A Few Times Per Month	Monthly	Several Times Per Year	Once Per Year	None
• most attendees are in person (face-to-face)?	2.0%	6.6%	10.9%	5.1%	28.1%	16.0%	31.3%
• all attendees are in person (face-to-face)?	0.0%	2.0%	3.5%	3.9%	20.3%	25.4%	44.9%

Virtuality Profile: Technology Tools Success in Meetings								
How would you rate your level of agreement with the following statements? Our team successfully holds meetings where:	Strongly Disagree	Disagree	Somewhat Disagree	Agree	Somewhat Agree	Agree	Strongly Agree	Does Not Occur
• Some are in person and some use audio conferencing.	1.2%	2.3%	1.2%	3.9%	9.0%	31.6%	39.1%	11.7%
• Some are in person and some use video conferencing.	1.6%	5.1%	3.1%	5.9%	10.2%	24.6%	20.3%	29.3%
• Some are in person, some use audio, and some use video conferencing.	3.5%	3.9%	3.9%	6.3%	10.5%	21.5%	19.9%	30.5%

N=226

Virtuality Profile: Technology Tools							
On average, how many times do you use:	None	Once Per Year	Several Times Per Year	Monthly	A Few Times Per Month	A Few Times a Week	Daily
• online text based tools? N=253	4.3%	0.0%	2.4%	1.6%	2.8%	10.3%	78.7%
• audio conferencing tools? N=251	4.0%	0.4%	4.0%	3.6%	12.7%	22.7%	52.6%
• video conferencing tools? N=251	22.7%	5.2%	19.1%	9.2%	15.1%	14.7%	13.9%
How would you rate your level of agreement with the following statement? Our team successfully uses:	Strongly Disagree	Disagree	Somewhat Disagree	Agree	Somewhat Agree	Agree	Strongly Agree
• online text based tools. N=240	4.6%	1.7%	2.1%	3.3%	9.2%	37.1%	42.1%
• audio conferencing tools. N=241	2.5%	0.4%	1.2%	4.1%	7.1%	33.2%	51.5%
• video conferencing tools. N=194	3.6%	8.8%	4.1%	11.3%	16.5%	32.0%	23.7%
Thinking about your level of expertise in using technology to communicate virtually, how comfort-table are you with using:	Extremely Uncomfortable	Uncomfortable	Somewhat Uncomfortable	Neutral	Somewhat Comfortable	Comfortable	Extremely Comfortable
• online text based tools? N=240	3.8%	0.8%	0.8%	3.3%	3.8%	31.7%	55.8%
• audio conferencing tools? N=241	1.7%	0.4%	0.4%	1.2%	5.8%	30.3%	60.2%
• video conferencing tools? N=194	1.0%	1.0%	4.6%	7.2%	19.1%	34.0%	33.0%

Appendix K

Figure K.1

Institutional Review Board Application

Online IRB Application Submitted for review:Dissertation - What is the nature of relationship and the influence of relationship on success in a virtual work environment? April 14, 2013, 1:06 pm

Admin & Tools/IRB x

ckenny@antioch.edu Apr 14

to me

Dear Carol Ransone ,
Your Antioch University Ethics Application has been received and a copy of your submission is below. The IRB committee will review your application and respond to you within two weeks regarding the results of its deliberations.
Until you have received formal notification of approval, you cannot collect data or interact with prospective participants for this project.
Thank you for your application.

**********application is below**********
1. Name and mailing address of Principal Investigator(s):
Carol Ransone
7734 Covey Chase Drive N/A Charlotte, NC 28210

For faculty applications, Co-Principal Investigator(s) name(s): N/A

2. Academic Department: PhD in Leadership and Change

3. Departmental Status: Student

4. Phone Number: (a) Work 704-650-3754(b) Home 704-554-7577

5. Name of research advisor: Elizabeth Holloway

6. Name & email address(es) of other researcher(s) involved in this project:
a) Name of Researcher(s)
N/A
b) E-mail address(es)
N/A

7.Project Title: Dissertation - What is the nature of relationship and the influence of relationship on success in a virtual work environment?

8.Is this project federally funded: No
Source of funding for this project (if applicable): This project is not funded externally. I will be funding this project independently, using some resources from my management consulting company - Ransone Group, LLC

9. Expected starting date for data collection: 04/17/2013

10. Expected completion date for data collection: 05/1/2013

11. Project Purpose(s): (Up to 500 words)
This research project will serve to understand more about virtual work environments and the importance of relationship on the perceived success of those working in a distributed nature. Research questions include:

- RQ1: What characterizes the profile of virtual workers in terms of the degree of virtuality demographic statistics?
- RQ2: How important is it to virtual workers to experience high-quality relationships in a virtual work environment?
- RQ3: What is the correlation between perception of relationship quality and relationship as measured by the Relational Health Indices and the Team Connection Subscale?
- RQ4: What factors influence perceived success in a virtual work environment?
- RQ5: What suggestions do virtual workers have for building and maintaining high-quality relationships or to improve productivity?

12. Describe the proposed participants- age, number, sex, race, or other special characteristics. Describe criteria for inclusion and exclusion of participants. Please provide brief justification for these criteria. (Up to 500 words)
Participants in the study will be a convenience sample and will represent a wide variety of industries and roles. The one requirement for participation in the study is that the participant must be a member of a virtual team, defined as a group of individuals located in different locations who are working together through technology facilitated communication to achieve common goals. Targeted participants will be those who are members of virtual internet communities, representing a wide variety of industries, (i.e. financial services, government, and human services). Some of the participants will operate in a global virtual network. By including an assortment of industries and including a global presence component, a more complete picture of the variety of work environments will be obtained. The total number of responses required for this research is 300.

13. Describe how the participants are to be selected and recruited. (Up to 500 words)
I am seeking to address two limitations of the majority of the studies of virtual team environments. Most of the studies use very small samples and/or fabricated teams. I will endeavor to reach a large population of those whose real-live work environment is virtual in nature. Participants will be a convenience sample of those working in virtual work environments. I will use direct email communications to colleagues as well as LinkedIn groups and networks. I will ask that the survey be cascaded to any contacts others have who satisfy the criteria for inclusion (detailed in question 2).

14. Describe the proposed procedures, (e.g., interview surveys, questionnaires, experiments, etc). in the project. Any proposed experimental activities that are included in evaluation, research, development, demonstration, instruction, study, treatments, debriefing, questionnaires, and similar projects must be described. USE SIMPLE LANGUAGE, AVOID JARGON, AND IDENTIFY ACRONYMS. Please do not insert a copy of your methodology section from your proposal. State briefly and concisely the procedures for the project. (500 words)
An online survey will be conducted using SurveyMonkey. The survey will include both quantitative and qualitative questions. The qualitative data will initially be reviewed to identify high-level common themes into which each of the answers will be coded. My new "degree of virtuality" scale will be derived from both qualitative and quantitative information using time zone and country dispersion; work effort allocation; and face-to-face meeting frequency.

15. Participants in research may be exposed to the possibility of harm - physiological, psychological, and/or social - please provide the following information: (Up to 500 words)
a. Identify and describe potential risks of harm to participants (including physical, emotional, financial, or social harm).
The survey includes specific questions regarding the relationship s/he has with the team leader and teammates. If that information were to be somehow shared with the other individuals, it could cause conflict and/or potentially impact his/her reputation or job status. It is for that reason that confidentiality is critical. Note that the broad participant pool will also facilitate anonymity.

b. Identify and describe the anticipated benefits of this research (including direct benefits to participants and to society-at-large or others)
This research is open to all who work virtually on teams, therefore it is quite possible that it will be global in nature. My questions do not focus specifically on a person's culture or on that of their colleagues, however I do ask if they work across country or time zone boundaries. The main focus is the dispersion the population, not the culture of the population.

c. Explain why you believe the risks are so outweighed by the benefits described above as to warrant asking participants to accept these risks. Include a discussion of why the research method you propose is superior to alternative methods that may entail less risk.
The advent of virtual work environments is still in its' infancy. My research will serve to add to the body of knowledge to understand virtual work environments. It will also illuminate the nature of relationship and the correlation to perceived success.

d. Explain fully how the rights and welfare of participants at risk will be protected (e.g., screening out particularly vulnerable participants, follow-up contact with participants, list of referrals, etc.) and what provisions will be made for the case of an adverse incident occurring during the study.
The survey will be voluntary and anonymous. Data will be maintained on my personal computer which is protected with multiple levels of passwords and encryption.

16. Explain how participants' privacy is addressed by your proposed research. Specify any steps taken to safeguard the anonymity of participants and/or confidentiality of their responses. Indicate what personal identifying information will be kept, and procedures for storage and ultimate disposal of personal information. Describe how you will de-identify the data or attach the signed confidentiality agreement on the attachements tab (scan, if necessary). (Up to 500 words)
Please the explanation above.

17. Will electrical, mechanical (electroencephalogram, biofeedback, etc.) be applied to participants, or will audio-visual devices be used for recording participants? No
If YES, describe the devices and how they will be used:
N/A

18. Type of Review: Full

Please provide your reasons/justification for the level of review you are requesting.
This is the first application submitted, therefore it requires full review.

19. Informed consent and/or assent statements, if any are used, are to be included with this application. If information other than that provided on the informed consent form is provided (e.g. a cover letter), attach a copy of such information. If a consent form is not used, or if consent is to be presented orally, state your reason for this modification below. *Oral consent is not allowed when participants are under age 18.
The survey will include the following text as an introduction (note that the names of the researcher and the IRB chair will be hyperlinks to email addresses): You are invited to participate in a research study investigating the role of relationship in virtual work environments. The purpose of the study is to further the understanding of virtual team environments, focusing from the personal perspective of those working virtually. Participation is voluntary and one may withdraw from the study at any time. Confidentiality of individual responses will be maintained, however those who participate in the survey are welcome to provide their email address so they may receive a copy of the Executive Summary. This study is being conducted by Carol Locher Ransone, a doctoral candidate in the Leadership and Change program at Antioch University, Yellow Springs, Ohio. The results of this study will be used for her doctoral dissertation and possibly other future publications. If you have !
questions or would like further information about this study, please contact the researcher (Carol Locher Ransone) or Antioch University's Leadership and Change Chair of the Institutional Review Board (Dr. Carolyn Kenny).

20. If questionnaires, tests, or related research instruments are to be used, then you must attach a copy of the instrument at the bottom of this form (unless the instrument is copyrighted material), or submit a detailed description (with examples of items) of the research instruments, questionnaires, or tests that are to be used in the project. Copies will be retained in the permanent IRB files. If you intend to use a copyrighted instrument, please consult with your research advisor and your IRB chair. Please clearly name and identify all attached documents when you add them on the attachments tab.
The Relational Health Index authored by Dr. Belle Liang was used to develop a new Relational Health Index for work environments. Dr. Liang has approved the use of her questions. The survey also uses some connectivity questions adapted from a part of Dr. Andrew Carmeli's High-quality relationship items. Dr. Carmeli has approved the use of his questions. Dr. Elizabeth Holloway and Dr. Carol Baron have been included in the design of the new instrument. The attached document (Survey For IRB.pdf) provides a printout of the survey.

I have agreed to conduct this project in accordance with Antioch University's policies and requirements involving research as outlined in the IRB Manual and supplemental materials.

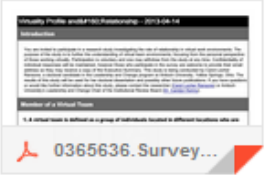
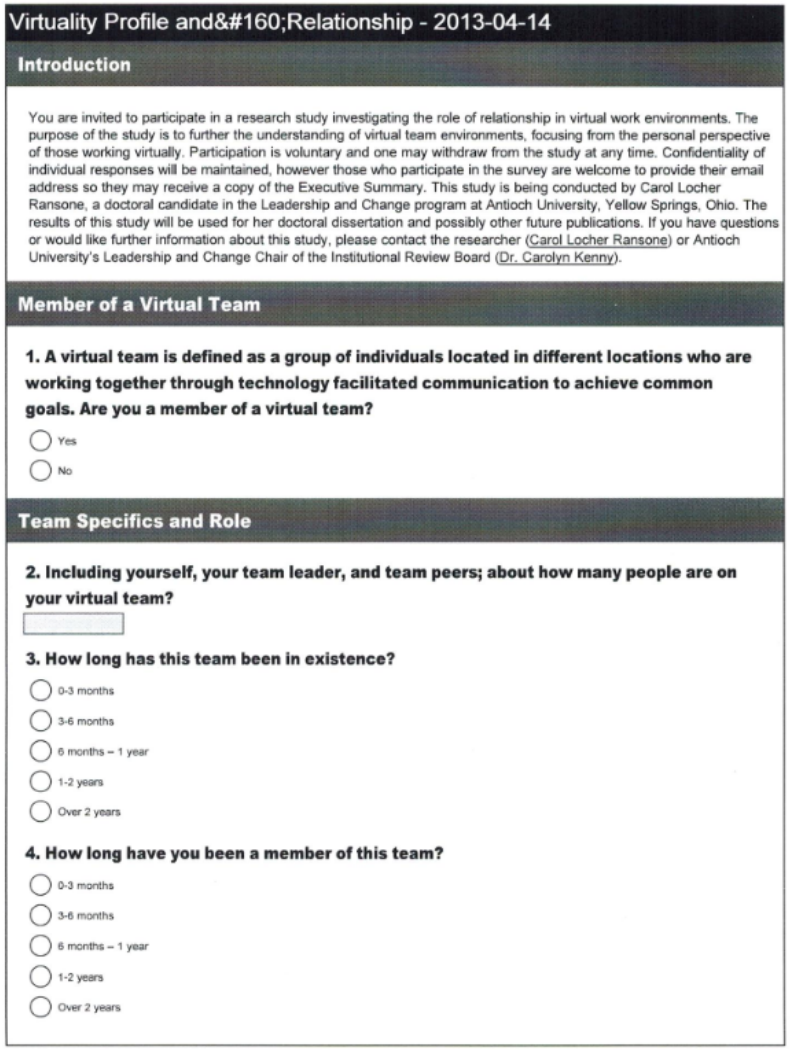


Figure K.2

Draft Survey Included With Institutional Review Board Application



Virtuality Profile and Relationship - 2013-04-14

Introduction

You are invited to participate in a research study investigating the role of relationship in virtual work environments. The purpose of the study is to further the understanding of virtual team environments, focusing from the personal perspective of those working virtually. Participation is voluntary and one may withdraw from the study at any time. Confidentiality of individual responses will be maintained, however those who participate in the survey are welcome to provide their email address so they may receive a copy of the Executive Summary. This study is being conducted by Carol Locher Ransone, a doctoral candidate in the Leadership and Change program at Antioch University, Yellow Springs, Ohio. The results of this study will be used for her doctoral dissertation and possibly other future publications. If you have questions or would like further information about this study, please contact the researcher (Carol Locher Ransone) or Antioch University's Leadership and Change Chair of the Institutional Review Board (Dr. Carolyn Kenny).

Member of a Virtual Team

1. A virtual team is defined as a group of individuals located in different locations who are working together through technology facilitated communication to achieve common goals. Are you a member of a virtual team?

- ◯ Yes
- ◯ No

Team Specifics and Role

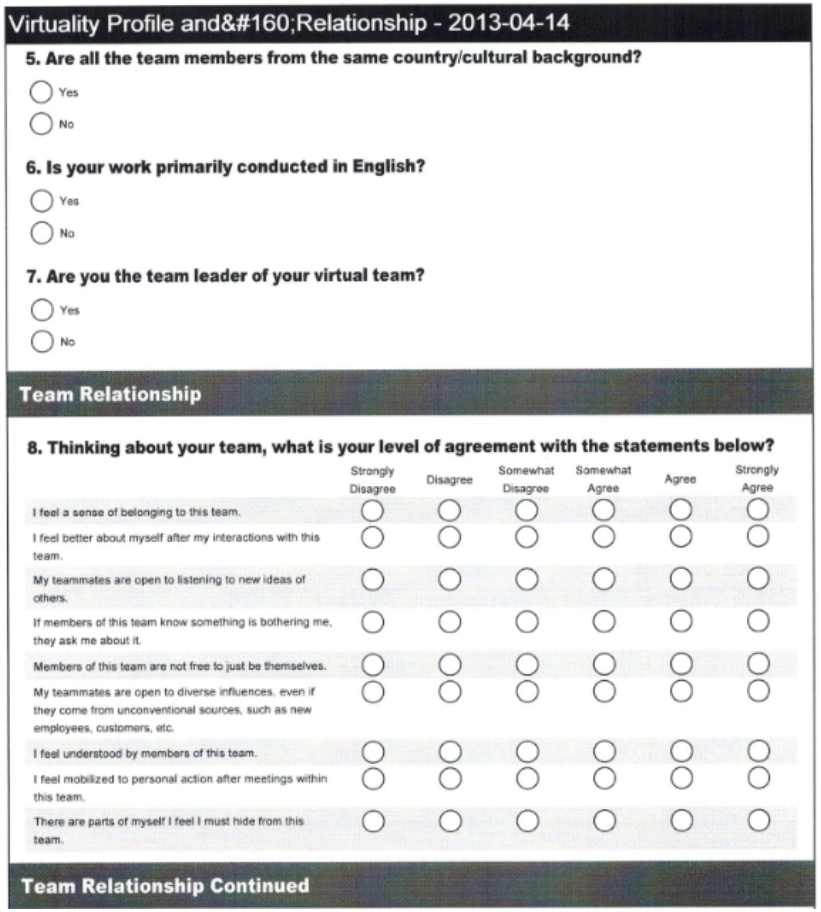
2. Including yourself, your team leader, and team peers; about how many people are on your virtual team?

3. How long has this team been in existence?

- ◯ 0-3 months
- ◯ 3-6 months
- ◯ 6 months – 1 year
- ◯ 1-2 years
- ◯ Over 2 years

4. How long have you been a member of this team?

- ◯ 0-3 months
- ◯ 3-6 months
- ◯ 6 months – 1 year
- ◯ 1-2 years
- ◯ Over 2 years



Virtuality Profile and Relationship - 2013-04-14

5. Are all the team members from the same country/cultural background?

- ◯ Yes
- ◯ No

6. Is your work primarily conducted in English?

- ◯ Yes
- ◯ No

7. Are you the team leader of your virtual team?

- ◯ Yes
- ◯ No

Team Relationship

8. Thinking about your team, what is your level of agreement with the statements below?

	Strongly Disagree	Disagree	Somewhat Disagree	Somewhat Agree	Agree	Strongly Agree
I feel a sense of belonging to this team.	◯	◯	◯	◯	◯	◯
I feel better about myself after my interactions with this team.	◯	◯	◯	◯	◯	◯
My teammates are open to listening to new ideas of others.	◯	◯	◯	◯	◯	◯
If members of this team know something is bothering me, they ask me about it.	◯	◯	◯	◯	◯	◯
Members of this team are not free to just be themselves.	◯	◯	◯	◯	◯	◯
My teammates are open to diverse influences, even if they come from unconventional sources, such as new employees, customers, etc.	◯	◯	◯	◯	◯	◯
I feel understood by members of this team.	◯	◯	◯	◯	◯	◯
I feel mobilized to personal action after meetings within this team.	◯	◯	◯	◯	◯	◯
There are parts of myself I feel I must hide from this team.	◯	◯	◯	◯	◯	◯

Team Relationship Continued

Virtuality Profile and Relationship - 2013-04-14

9. Again, thinking about your team, what is your level of agreement with the statements below?

	Strongly Disagree	Disagree	Somewhat Disagree	Somewhat Agree	Agree	Strongly Agree
It seems as if people in this team really like me as a person.	◯	◯	◯	◯	◯	◯
There is a lot of backbiting and gossiping in this team.	◯	◯	◯	◯	◯	◯
Members of this team are very competitive with each other.	◯	◯	◯	◯	◯	◯
I have a greater sense of self-worth through my connection with this team.	◯	◯	◯	◯	◯	◯
My connections with this team are so inspiring that they motivate me to pursue relationships with other people outside this team.	◯	◯	◯	◯	◯	◯
My teammates are attentive to new opportunities that can make things more efficient and effective.	◯	◯	◯	◯	◯	◯
This team has shaped my identity in many ways.	◯	◯	◯	◯	◯	◯
This team provides me with emotional support.	◯	◯	◯	◯	◯	◯
My teammates know how to accept people who are different than themselves.	◯	◯	◯	◯	◯	◯

10. How would you rate your level of agreement with the following statements?

	Strongly Disagree	Disagree	Somewhat Disagree	Somewhat Agree	Agree	Strongly Agree
It is important to me to have high-quality relationships with my teammates.	◯	◯	◯	◯	◯	◯
I have high-quality relationships with my teammates.	◯	◯	◯	◯	◯	◯
The technology tools have helped me build high-quality relationships with my teammates.	◯	◯	◯	◯	◯	◯

11. What examples can you provide of things you or your teammates have done to build or maintain high-quality relationships within the team?

12. What makes it difficult to have high-quality relationships within the team?

Virtual Profile: Geographic

A primary work location is the the place from which one normally performs his/her job.

Virtuality Profile and Relationship - 2013-04-14

13. What best describes your primary work location?

- ◯ Assigned workspace in an office building (space is assigned to me)
- ◯ Shared workspace in an office building (workspace is shared with one or more teammates)
- ◯ Unassigned workspace in an office building (workspace available for use by all on a short-term or drop-in basis)
- ◯ Flexible work center (a building or floor that is share among a variety of teams within my organization)
- ◯ Workspace at a another organization with whom my team partners
- ◯ Temporary or rented space that is not managed within my organization
- ◯ Home office
- ◯ Other (please specify)

14. What best describes the primary work location of your teammates? They are:

- ◯ in the same building or complex.
- ◯ not in the same building / complex but in the same local geographic area.
- ◯ not in the same local geographic area but in the same country and time zone.
- ◯ not in the same local geographic area but in the same country but different time zones.
- ◯ not in the same time zone but within the same country.
- ◯ in different countries all within the same time zone.
- ◯ in different countries and different time zones.

15. Select what best describes the primary work locations of your teammates:

- ◯ All teammates work from different primary work locations.
- ◯ Most teammates work from different primary work locations.
- ◯ There are a few locations in which most teammates work and others are distributed.
- ◯ There is one location in which most teammates work and others are distributed.

16. Select what best describes where you work in relation to your teammates?

- ◯ There are no other teammates at my primary work location.
- ◯ I work from a location where a few of my teammates are located.
- ◯ I work from a location where most of my teammates are located.

Virtuality Profile and Relationship - 2013-04-14

17. One way to measure how virtual a team may be geographic.

Reflecting on your team's geographic related aspects, how "virtual" would you rate your team?

1 Not at all Virtual	2	3	4	5	6	7	8	9	10 Extremely Virtual
◯	◯	◯	◯	◯	◯	◯	◯	◯	◯

Virtual Profile: Interaction

18. On average, how many times do you have meetings where:

	Daily	A Few Times a Week	A Few Times Per Month	Monthly	Several Times Per Year	Once Per Year	None
none of the attendees are in person (face-to-face)?	◯	◯	◯	◯	◯	◯	◯
only a few attendees are in person (face-to-face)?	◯	◯	◯	◯	◯	◯	◯
most attendees are in person (face-to-face)?	◯	◯	◯	◯	◯	◯	◯
all attendees are in person (face-to-face)?	◯	◯	◯	◯	◯	◯	◯

19. How would you rate your level of agreement with the following statements? Our team successfully holds meetings where:

	Strongly Disagree	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree	Strongly Agree	Does not Occur
Some are in-person and some use audio conferencing (Teleconference, bridge line, etc.).	◯	◯	◯	◯	◯	◯	◯	◯
Some are in person and some use video conferencing (TelePresence, Skype, Go to Meeting, etc.).	◯	◯	◯	◯	◯	◯	◯	◯
Some are in-person, some use audio, and some use video conferencing.	◯	◯	◯	◯	◯	◯	◯	◯

20. On average, what percentage of your time do you spend (the total of time should add to 100):

doing individual work? ☐

communicating virtually with other persons using technology (i.e. email, phone, chat)? ☐

meeting face-to-face (in person)? ☐

other? ☐

21. If you selected "other" in the previous question, what best describes that activity?

☐

Virtuality Profile and Relationship - 2013-04-14

22. What routines does your team use to stay connected?

☐

23. One way to measure how virtual a team may be how the team interacts with each other.

Reflecting on how your team interacts, how "virtual" would you rate your team?

1 Not at all Virtual	2	3	4	5	6	7	8	9	10 Extremely Virtual
◯	◯	◯	◯	◯	◯	◯	◯	◯	◯

Virtual Profile: Use of Online Text-based Tools

24. On average, how many times do you use online text-based - not voice based tools (Instant Messaging, Communicator, non-video Skype, etc.)?

- ◯ Daily
- ◯ A Few Times a Week
- ◯ A Few Times Per Month
- ◯ Monthly
- ◯ Several Times Per Year
- ◯ Once Per Year
- ◯ None

Virtual Profile: Expertise in Online Text-based Tools

25. How would you rate your level of agreement with the following statement? Our team successfully uses online text-based tools.

- ◯ Strongly Disagree
- ◯ Disagree
- ◯ Somewhat Disagree
- ◯ Neutral
- ◯ Somewhat Agree
- ◯ Agree
- ◯ Strongly Agree

Virtuality Profile and Relationship - 2013-04-14

26. Thinking about your level of expertise in using technology to communicate virtually, how comfortable are you with using online text-based tools?

- ◯ Extremely Uncomfortable
- ◯ Uncomfortable
- ◯ Somewhat Uncomfortable
- ◯ Neutral
- ◯ Somewhat Comfortable
- ◯ Comfortable
- ◯ Extremely Comfortable

Virtual Profile: Use of Audio Conferencing

27. On average, how many times do you use audio conferencing tools (Teleconference, bridge line, etc.)?

- ◯ Daily
- ◯ A Few Times a Week
- ◯ A Few Times Per Month
- ◯ Monthly
- ◯ Several Times Per Year
- ◯ Once Per Year
- ◯ None

Virtual Profile: Expertise in Voice Conferencing Tools

28. How would you rate your level of agreement with the following statement? Our team successfully uses voice conferencing tools.

- ◯ Strongly Disagree
- ◯ Disagree
- ◯ Somewhat Disagree
- ◯ Neutral
- ◯ Somewhat Agree
- ◯ Agree
- ◯ Strongly Agree

Virtuality Profile and Relationship - 2013-04-14

29. Thinking about your level of expertise in using technology to communicate virtually, how comfortable are you with using voice conferencing tools?

- ◯ Extremely Uncomfortable
- ◯ Uncomfortable
- ◯ Somewhat Uncomfortable
- ◯ Neutral
- ◯ Somewhat Comfortable
- ◯ Comfortable
- ◯ Extremely Comfortable

Virtual Profile: Use of Online Video Conferencing

30. On average, how many times do you use video conferencing tools (TelePresence, Skype, Go to Meeting, etc.)?

- ◯ Daily
- ◯ A Few Times a Week
- ◯ A Few Times Per Month
- ◯ Monthly
- ◯ Several Times Per Year
- ◯ Once Per Year
- ◯ None

Virtual Profile: Expertise in Video Conferencing Tools

31. How would you rate your level of agreement with the following statement? Our team successfully uses video conferencing tools.

- ◯ Strongly Disagree
- ◯ Disagree
- ◯ Somewhat Disagree
- ◯ Neutral
- ◯ Somewhat Agree
- ◯ Agree
- ◯ Strongly Agree

Virtuality Profile and Relationship - 2013-04-14

32. Thinking about your level of expertise in using technology to communicate virtually, how comfortable are you with using video conferencing tools?

- ◯ Extremely Uncomfortable
- ◯ Uncomfortable
- ◯ Somewhat Uncomfortable
- ◯ Neutral
- ◯ Somewhat Comfortable
- ◯ Comfortable
- ◯ Extremely Comfortable

33. One way to measure how virtual a team may be the use and effectiveness of technology tools.

Reflecting on how your team uses technology tools, how "virtual" would you rate your team?

1 Not at all Virtual	2	3	4	5	6	7	8	9	10 Extremely Virtual
◯	◯	◯	◯	◯	◯	◯	◯	◯	◯

Summary

34. A virtual team is defined as a group of individuals located in different locations who are working together through technology facilitated communication to achieve common goals.

Reflecting on this definition, how "virtual" would you rate your team overall?

1 Not at all Virtual	2	3	4	5	6	7	8	9	10 Extremely Virtual
◯	◯	◯	◯	◯	◯	◯	◯	◯	◯

35. What comments do you have about your team's level of virtuality?

Virtuality Profile and Relationship - 2013-04-14

Thank you for supporting our research efforts! If you have colleagues who are working in virtual team environments, please forward the survey so they may also participate. The link to the survey is on the Research page of www.RansoneGroup.com or RansoneGroup Research. Once available, the Executive Summary will be posted at the same location.

Virtuality Profile and Relationship - 2013-04-14

36. How would you rate your level of agreement with the following statements?

	1 Strongly Disagree	2	3	4	5	6	7	8	9	10 Strongly Agree
My team achieves its' goals.	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
I am satisfied with my job.	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
I am satisfied with the relationships we have in our team.	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯

Personal Demographics

37. Are you male or female?

- ◯ Male
- ◯ Female

38. Which category below includes your age?

- ◯ under 21
- ◯ 21-29
- ◯ 30-39
- ◯ 40-49
- ◯ 50-59
- ◯ 60+

39. What is the field or industry of your employer?

☐

Other (please specify)

Closing Page

40. Do you have any suggestions that would make you more productive working virtually?

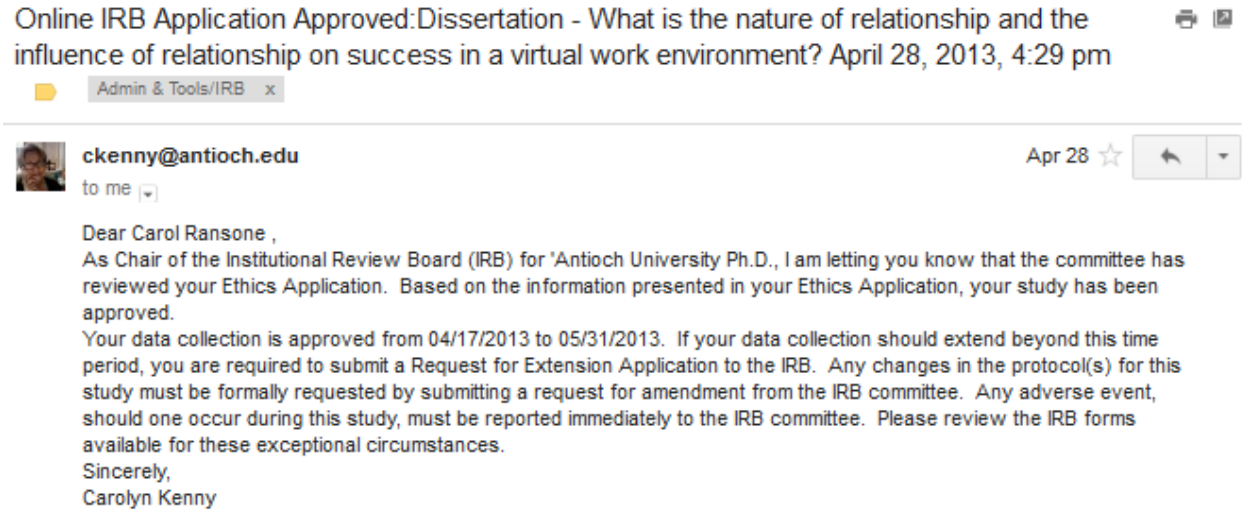
Research Participation

This research is focused on those who are working in a virtual team environment. As you are not currently part of a virtual team it is not necessary for you to complete this survey. We do appreciate your interest in this research.

Thank you

Figure K.3

Institutional Review Board Approval



Online IRB Application Approved:Dissertation - What is the nature of relationship and the influence of relationship on success in a virtual work environment? April 28, 2013, 4:29 pm

Admin & Tools/IRB x

ckenny@antioch.edu Apr 28

to me

Dear Carol Ransone ,
As Chair of the Institutional Review Board (IRB) for 'Antioch University Ph.D., I am letting you know that the committee has reviewed your Ethics Application. Based on the information presented in your Ethics Application, your study has been approved.
Your data collection is approved from 04/17/2013 to 05/31/2013. If your data collection should extend beyond this time period, you are required to submit a Request for Extension Application to the IRB. Any changes in the protocol(s) for this study must be formally requested by submitting a request for amendment from the IRB committee. Any adverse event, should one occur during this study, must be reported immediately to the IRB committee. Please review the IRB forms available for these exceptional circumstances.
Sincerely,
Carolyn Kenny

Appendix L

Executive Summary Report

The Nature and Influence of Relationship on Perceived Success in a Virtual Work Environment

2014

Executive Summary Report

Presented By:

RANSONE GROUP

Research Overview

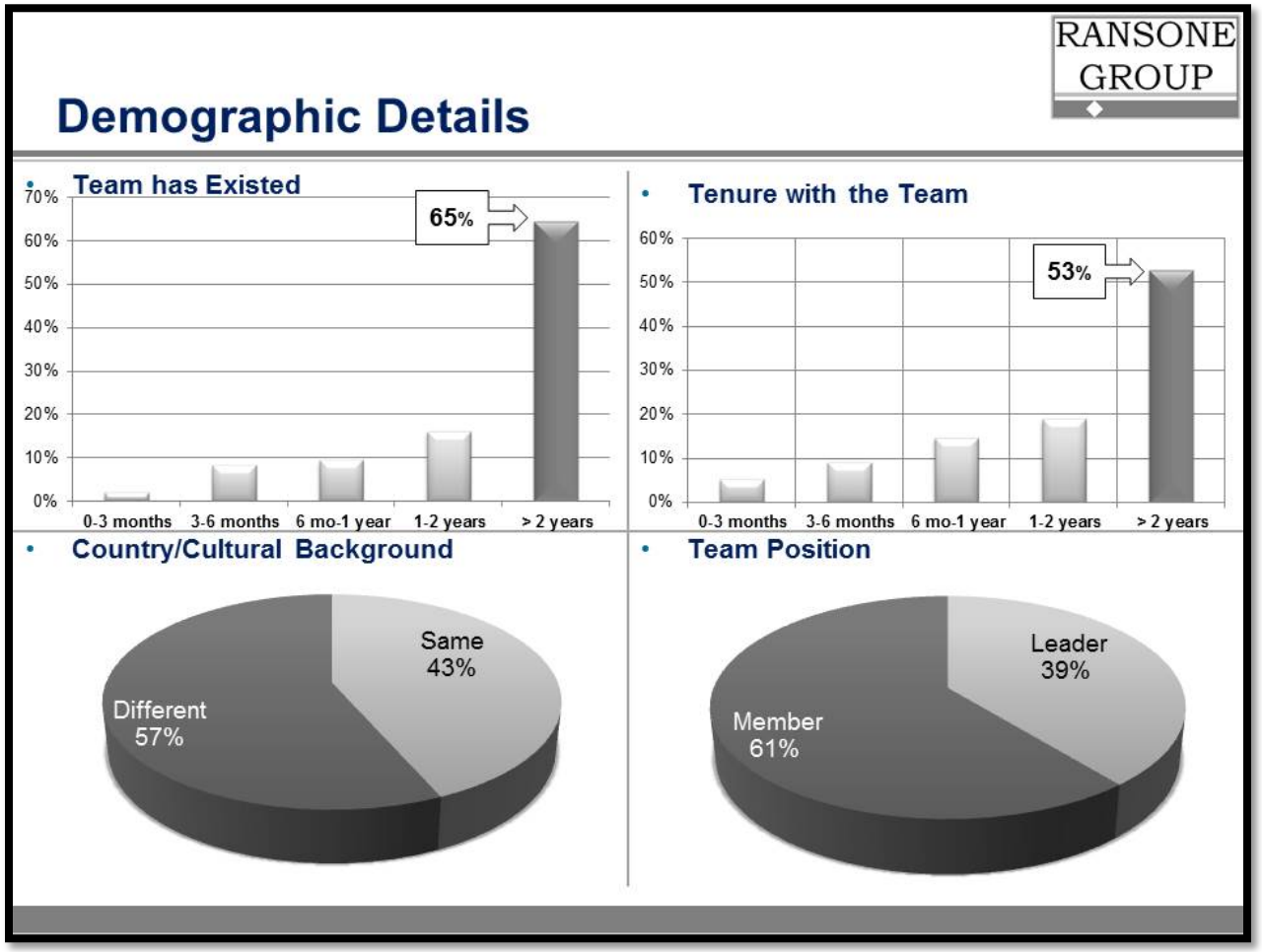
This study was conducted by Carol Locher Ransone as part of her doctoral dissertation in the Leadership and Change program at Antioch University. Dr. Elizabeth Holloway was the chairperson of her committee. The title of her dissertation is "The Nature and Influence of Relationship on Success in a Virtual Work Environment. The electronic version of this dissertation is at OhioLink ETD Center, http://www.ohiolink.edu/etd. An overview of the dissertation is provided in the abstract from her dissertation, as follows:

> The evolution of technology in the 21st century has led to a greater understanding of the benefits and the challenges of expanding work relationships across geographical boundaries. This expansion has contributed to the development of a global society with over three million employee teleworkers (Global Workplace Analytics and the Telework Research Network, 2013). In spite of the advances in connecting across the globe technologically, the importance of successfully working together in a virtual work environment is grounded in relationships that foster individual growth and group cohesion. The human elements of connectivity are primary to the success of organizations as well as fulfillment of the individual. This study explores the importance of relationship within the world of virtual work and investigates the various aspects of virtual work environments to understand overall virtuality. The Relational Health Indices (RHI) were used as a foundation to build the means for measuring relationship quality among teammates. These were then explored as a means to provide insight into the importance of relationship within the world of virtual work. The primary research question for this study was: "What is the nature and influence of relationship on success in a virtual work environment?" Success is defined here as perceived team goal achievement, job satisfaction, and relationship satisfaction. The research design consists of a mixed-methods, descriptive, and correlational study looking at the nature and influence of relationship on success in a virtual work environment based on a hierarchical multiple regression analysis of data collected from an online survey. A content analysis of participant responses to open-ended survey questions was employed. Major findings include: the development of a tool to measure relationship quality between teammates; the factors that influence perceived success; demographic differences in relationship quality; difference in importance of relationship versus the existence of relationship in virtual work environments; and the wide variation in the work environments of virtual workers. The electronic version of this dissertation is at OhioLink ETD Center, http://www.ohiolink.edu/etd.[1]

Demographic Details of the Respondents

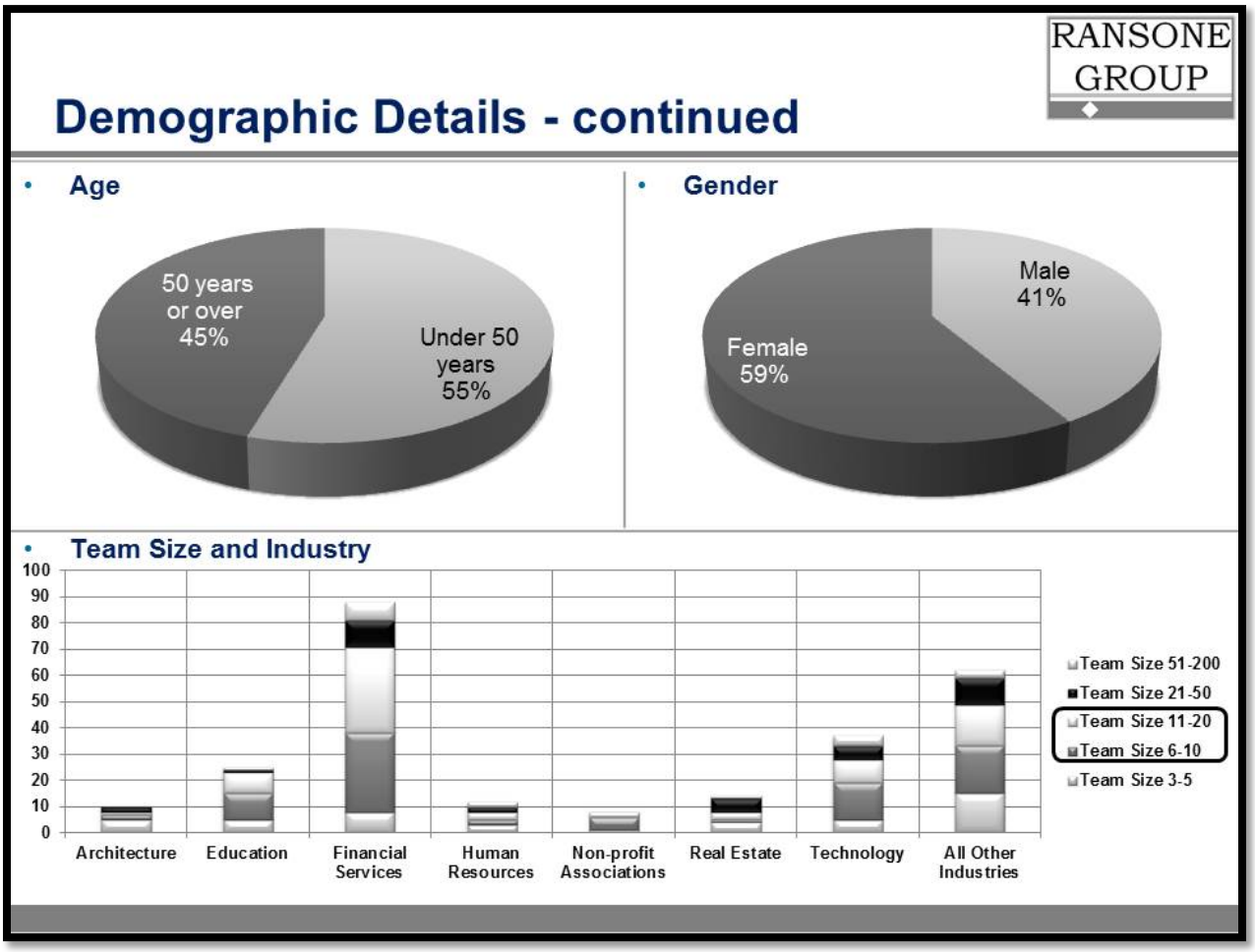
A total of 410 individuals began the survey. The number of completed surveys representing those who worked in a virtual team environment was 256. The majority of respondents (65%) had been on teams that had existed for longer than two years. And the tenure on the team for the majority (53%) was over two years. Most (57%) were on teams comprised of individuals from different country/cultural backgrounds. And the majority (61%) was a team member as opposed to the leader of their team. (See Figure 1.)

Figure 1: Team Demographic Details Overview A



Respondents represented both those under 50 years of age (55%) and 50 years or over (45%). The majority (59%) of the respondents were female. The majority of the teams ranged from 6-20 persons. Financial Services, Technology, and Education were the most represented industries. (See Figure 2.)

Figure 2: Team Demographic Details Overview B

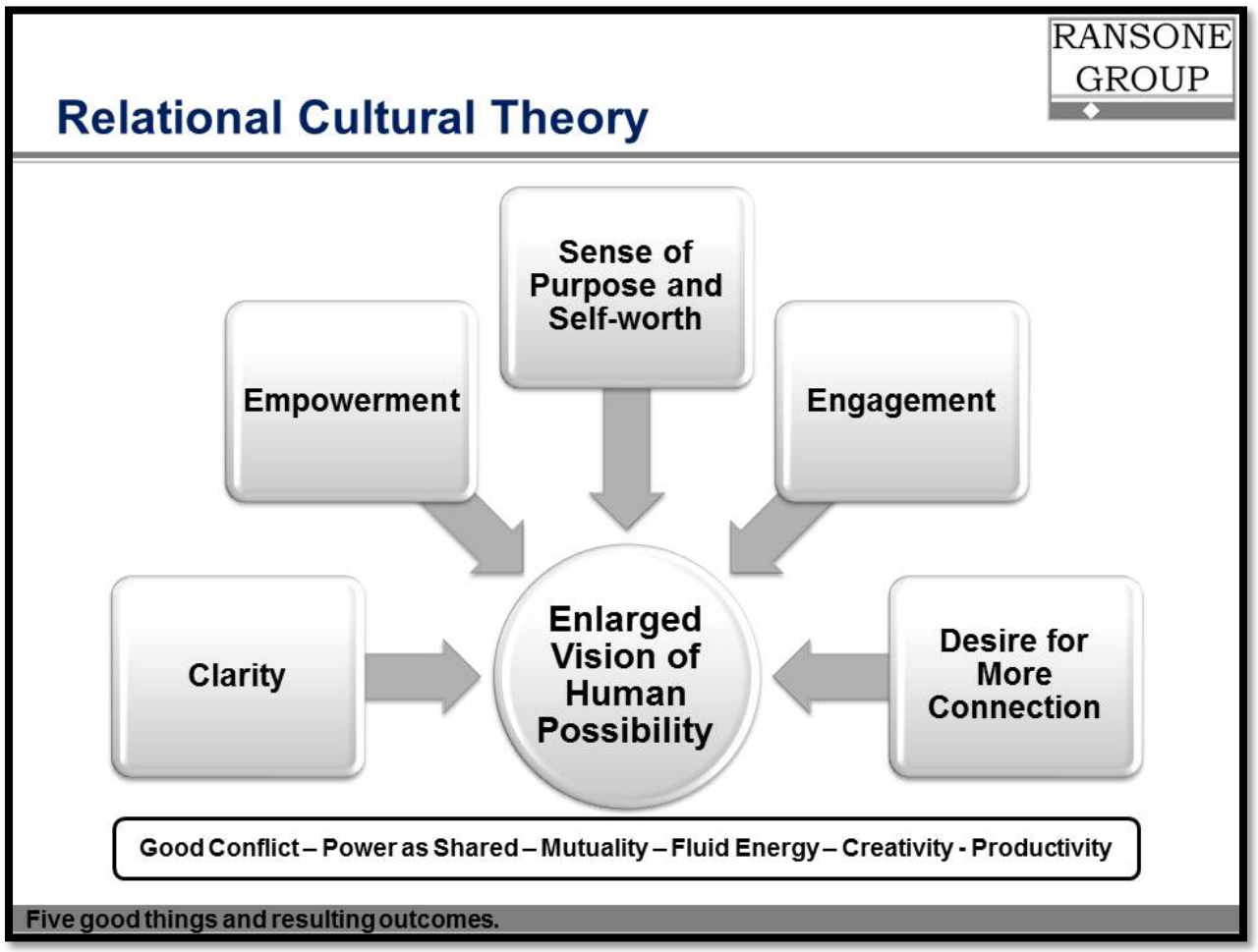


Four key findings resulted from this study, as follows: 1) the role of relationship in virtual teams, 2) demographic difference in relationship, 3) the importance versus existence of high-quality relationships, and 4) the components of virtuality.

The Role of Relationship in Virtual Teams

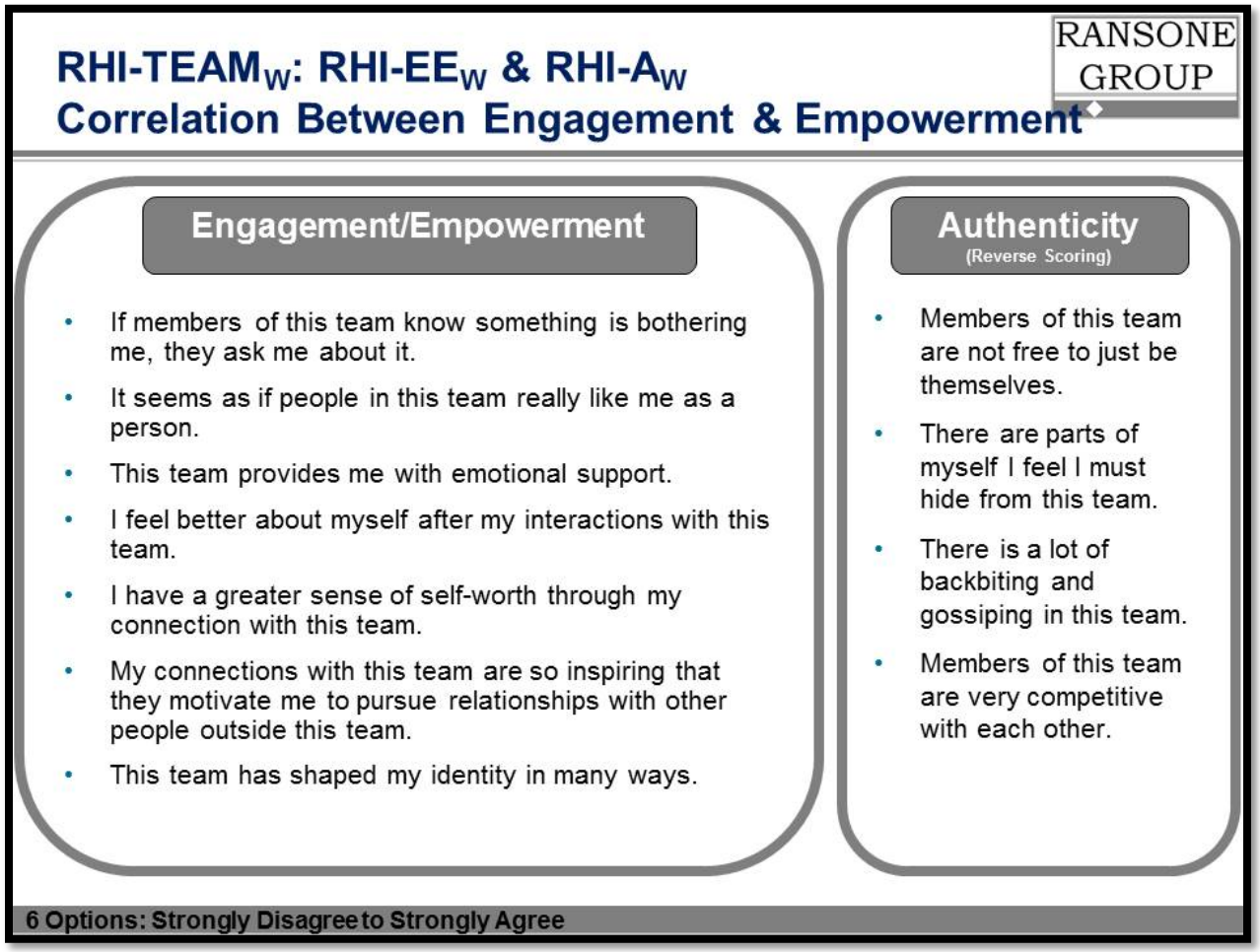
Relational Cultural Theory began with Jean Baker Miller's *Toward a New Psychology of Women* (1970). The evolution of the theory has been characterized as one that "has been a movement from a psychology of separation to one of connection, and it represents a profound change in our approach to understanding people."[2] RCT creates a framework to understand the importance of relationship and the resulting outcome. (See Figure 3.)

Figure 3: Relational Cultural Theory and Resulting Outcomes



A proposed tool to measure relationship between teammates was developed using the Relational Health Index as a foundation.[3] The resulting tool called RHI-TEAM$_W$ consisted of 11 items to rate relationship quality within the dimensions of engagement/empowerment (RHI-EE$_W$) and authenticity (RHI-A$_W$). Verification of the new tool to measure relationship included determining whether the respondent's perception of high-quality relationships agreed with the RHI-EE and RHI-AW components to ensure validity. (See Figure 4.)

Figure 4: RHI-TEAM$_W$ Items

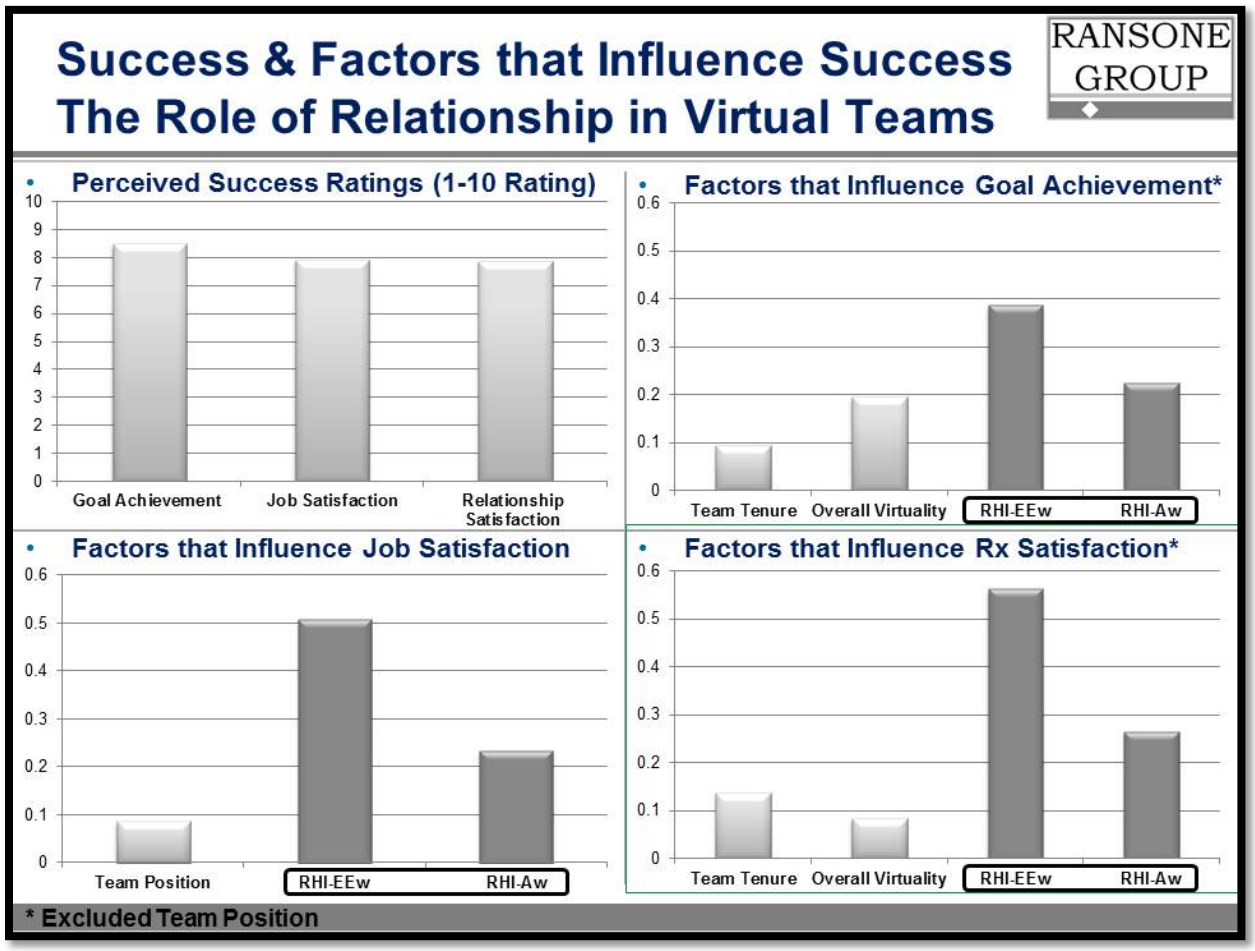


Perceived success was measured by requesting respondents to rate their agreement with the following questions on a 10-point scale where *1=Strongly Disagree and 10=Strongly Agree*:

- My team achieves its goals.
- I am satisfied with my job.
- I am satisfied with the relationships we have in our team.

Analysis of the factors that impact perceived success identified that relationship as measured by the RHI-TEAM$_W$ components of RHI-EE$_W$ and RHI-A$_W$ influenced perceived success. (See Figure 5.)

Figure 5: Factors that Influence Success

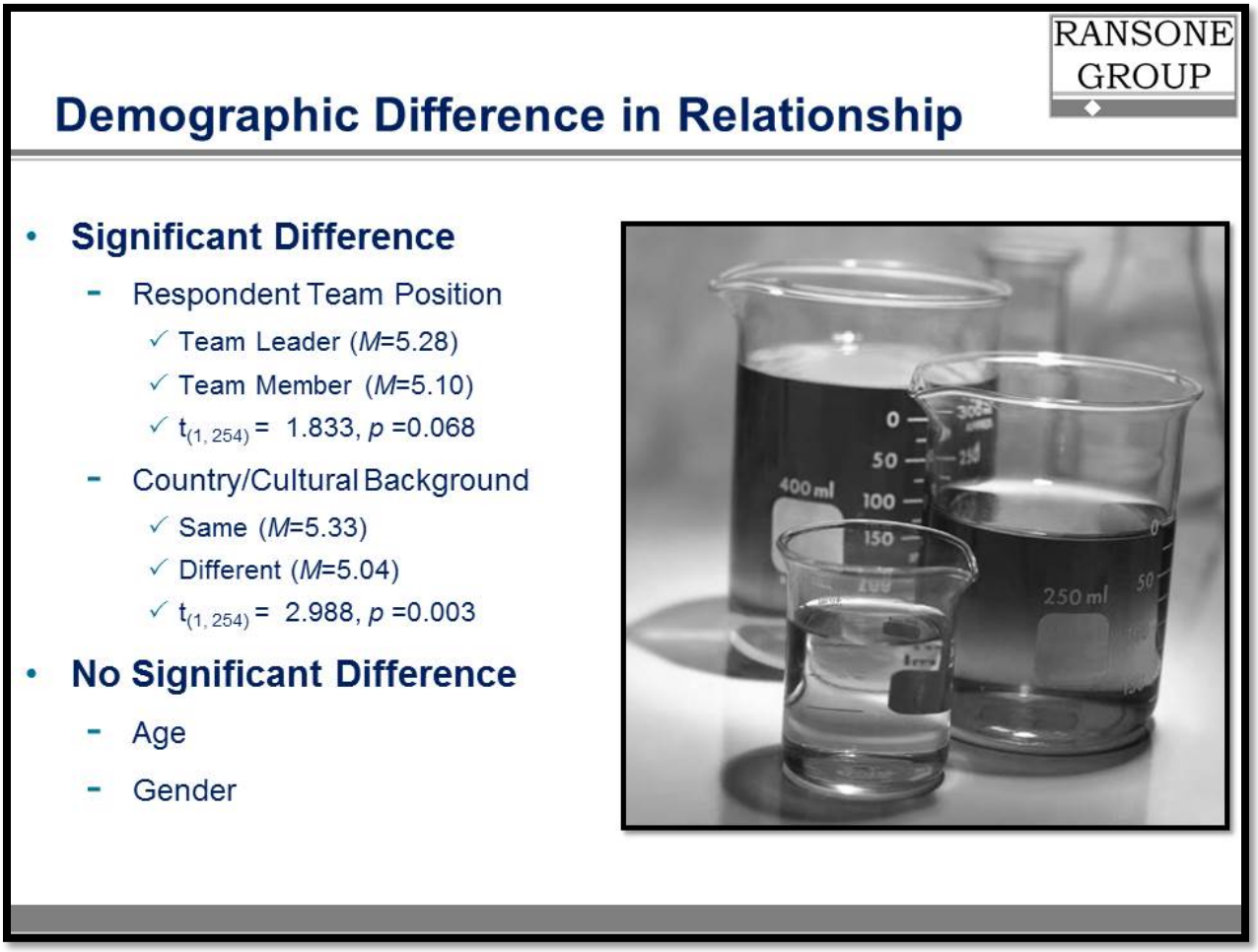


The development of a new tool to measure relationship quality and the identification of relationship as the most impactful factors on perceived success were the most salient findings of this study.

Demographic Difference in Relationship

Identification of demographic differences in relationship revealed some interesting results. Significant difference was identified between those who were team leaders versus team members and those who were from the same versus different country/cultural backgrounds. (See Figure 6.)

Figure 6: Demographic Difference in Relationship

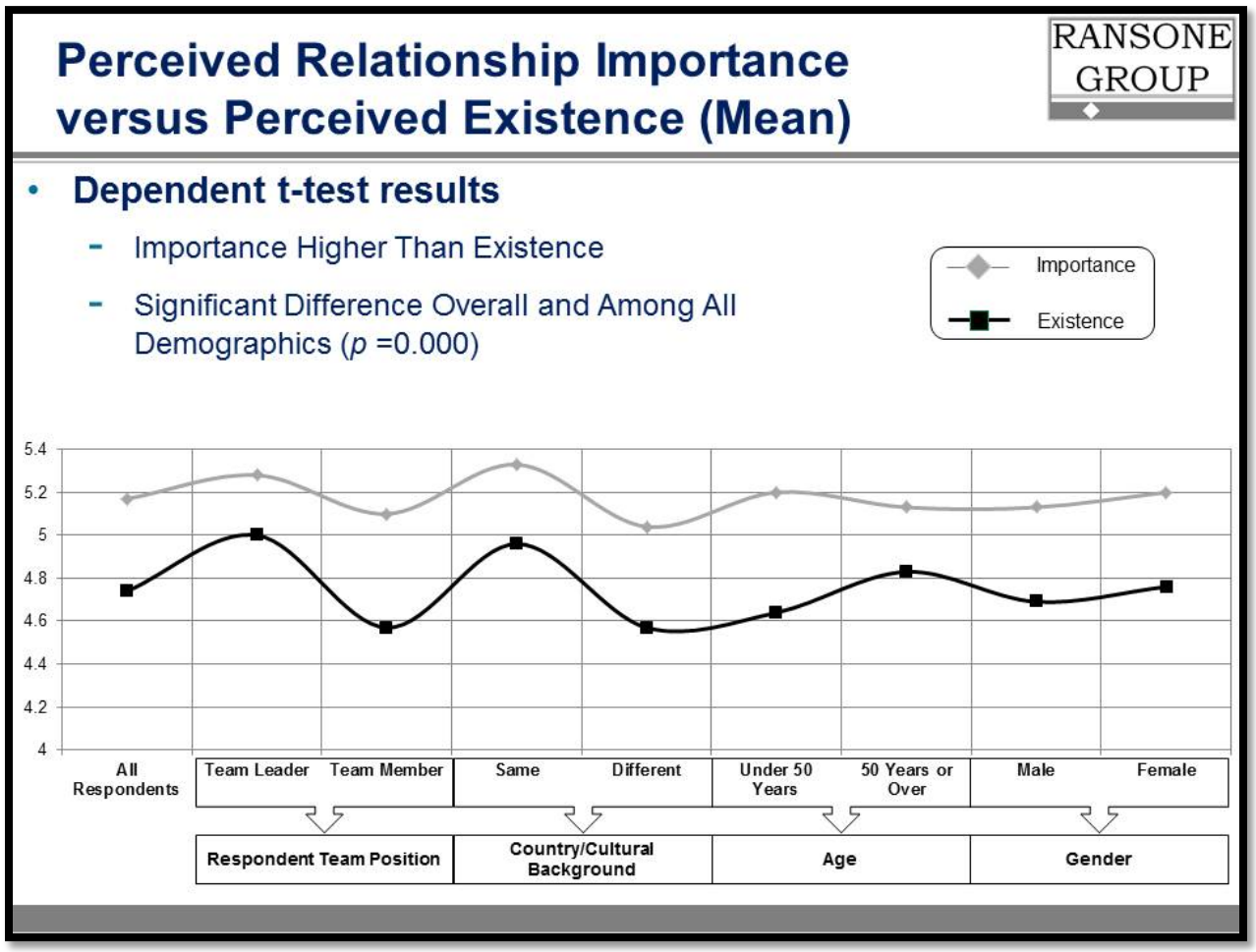


One might assume that the largest difference would be in gender; however, the differences between male versus female were not statistically significant. In addition, the difference between those under 50 versus 50 and over was not significant.

The Importance Versus Existence of High-quality Relationships

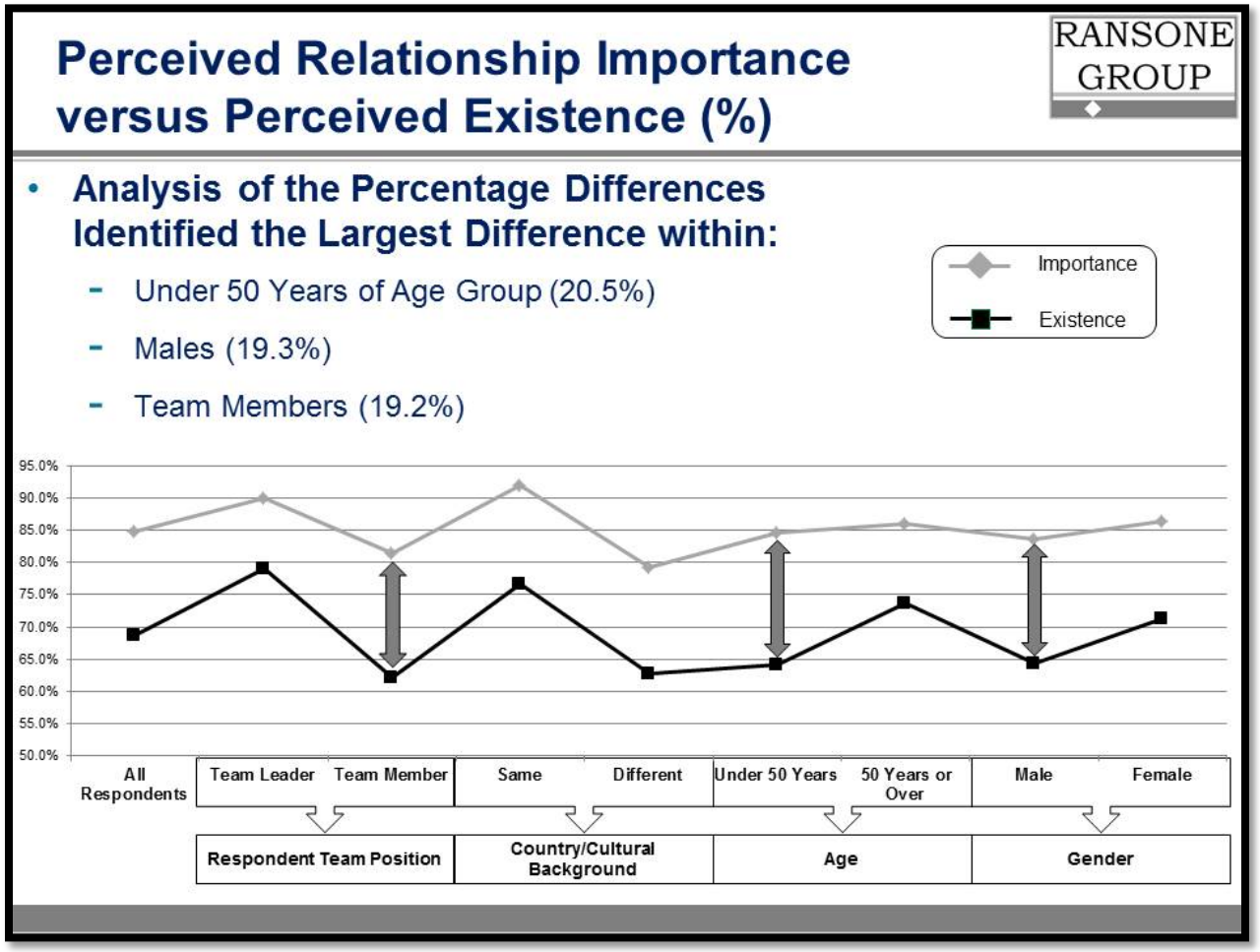
Respondents were asked to rate their perception of the importance of high-quality relationships and whether they experience them in their work environment. For all demographics analyzed there was statistical significant difference in the mean scores of perceived importance versus existence. (See Figure 7.)

Figure 7: Demographic Difference in Mean Scores of Relationship



The largest difference in percentage scores was within team members, those under 50 years of age, and males. (See Figure 8.)

Figure 8: Demographic Difference in Percentage Scores of Relationship

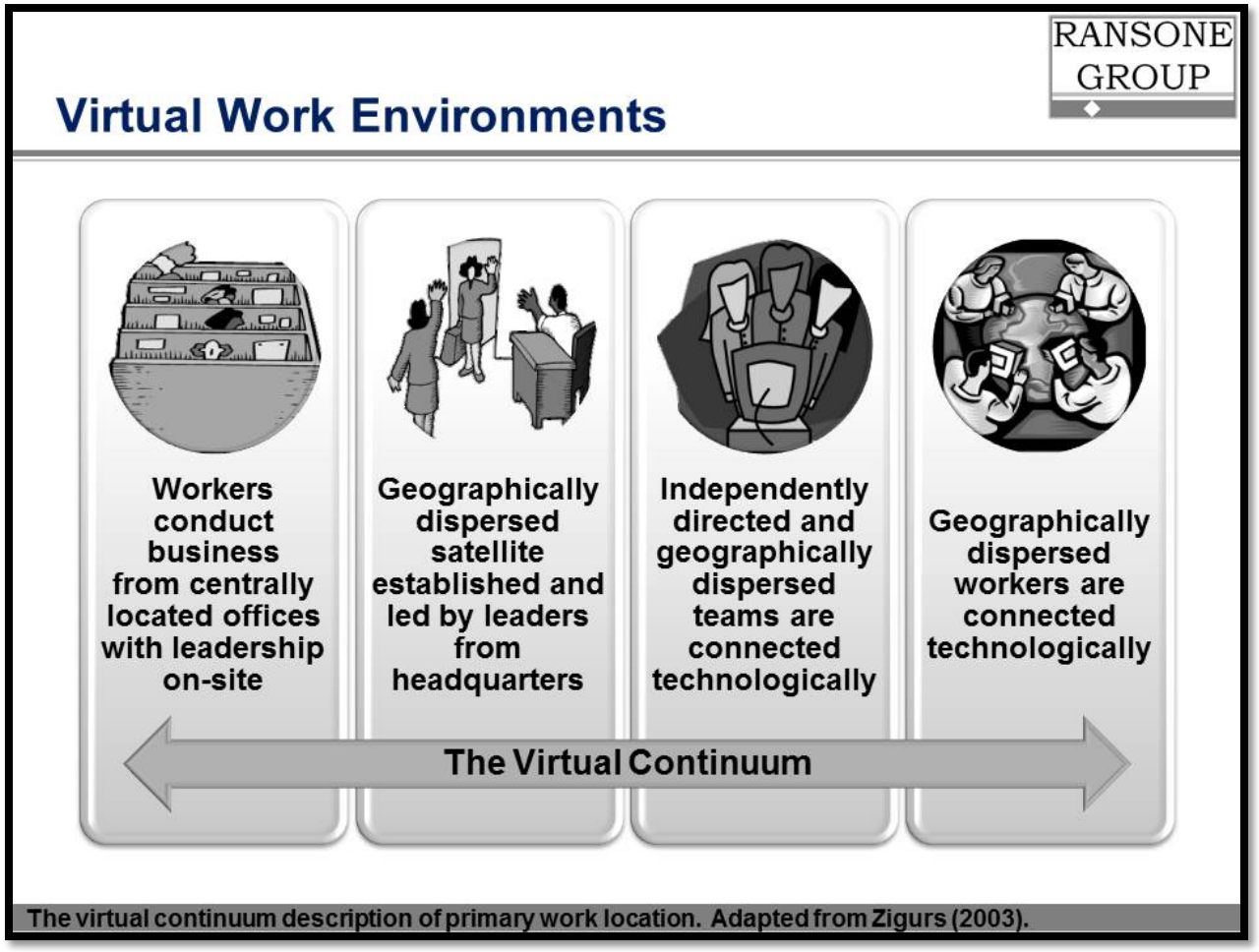


Clearly more work is required to address the differences between perceived importance versus existence of high-quality relationships.

The Components of Virtuality

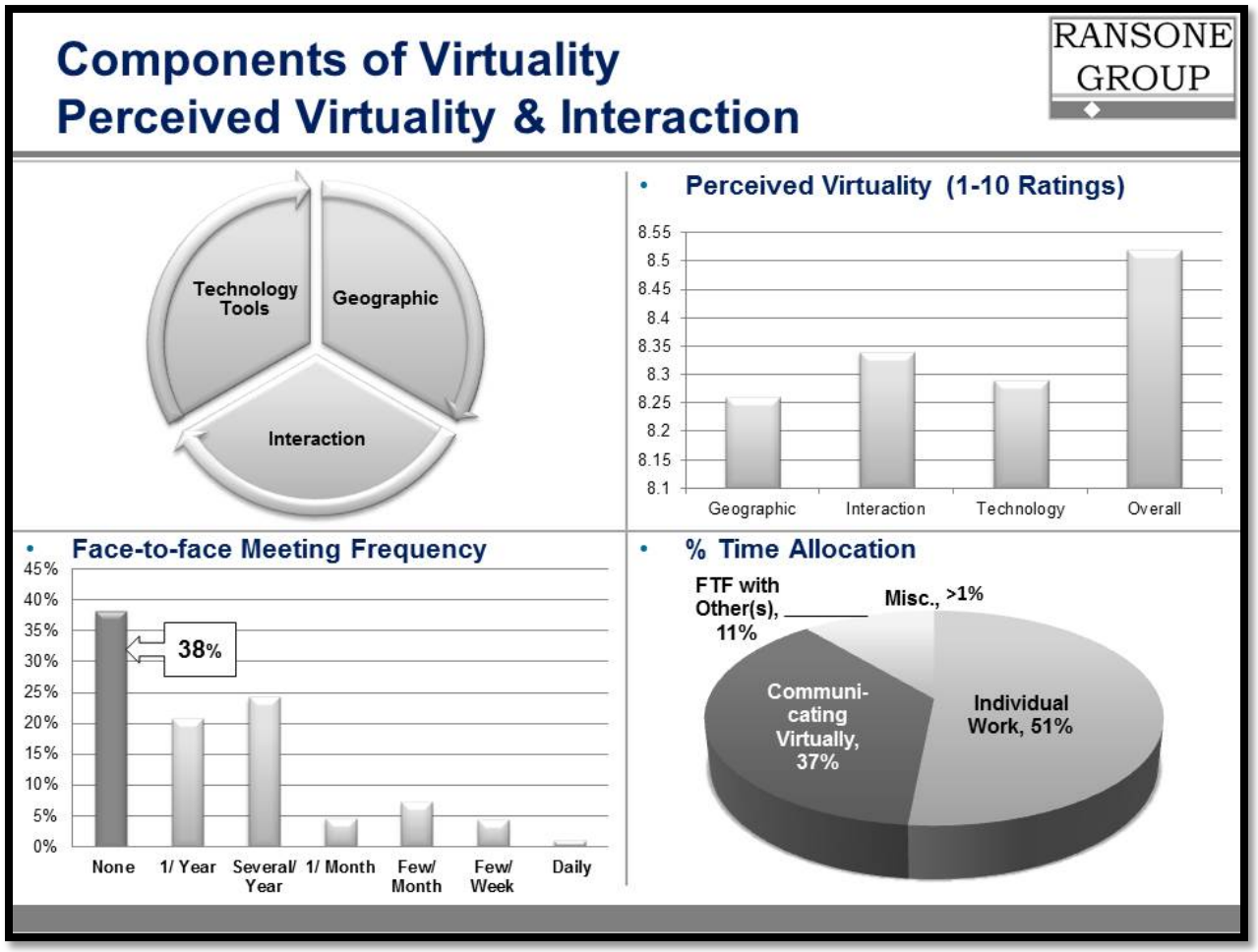
A wide variety of data regarding virtual work environments was obtained through this research. This study identified three aspects of virtuality. The first was interaction and attempted to understand how teammates interacted with each other. The second was geographic, referring to the primary work locations of teammates. The third involved the employment, expertise, and success of the use of virtual tools. Zigurs[4] introduce the concept of a virtual continuum to describe the various work environments in which virtual workers perform their tasks. (See Figure 9.)

Figure 9: The Virtual Continuum



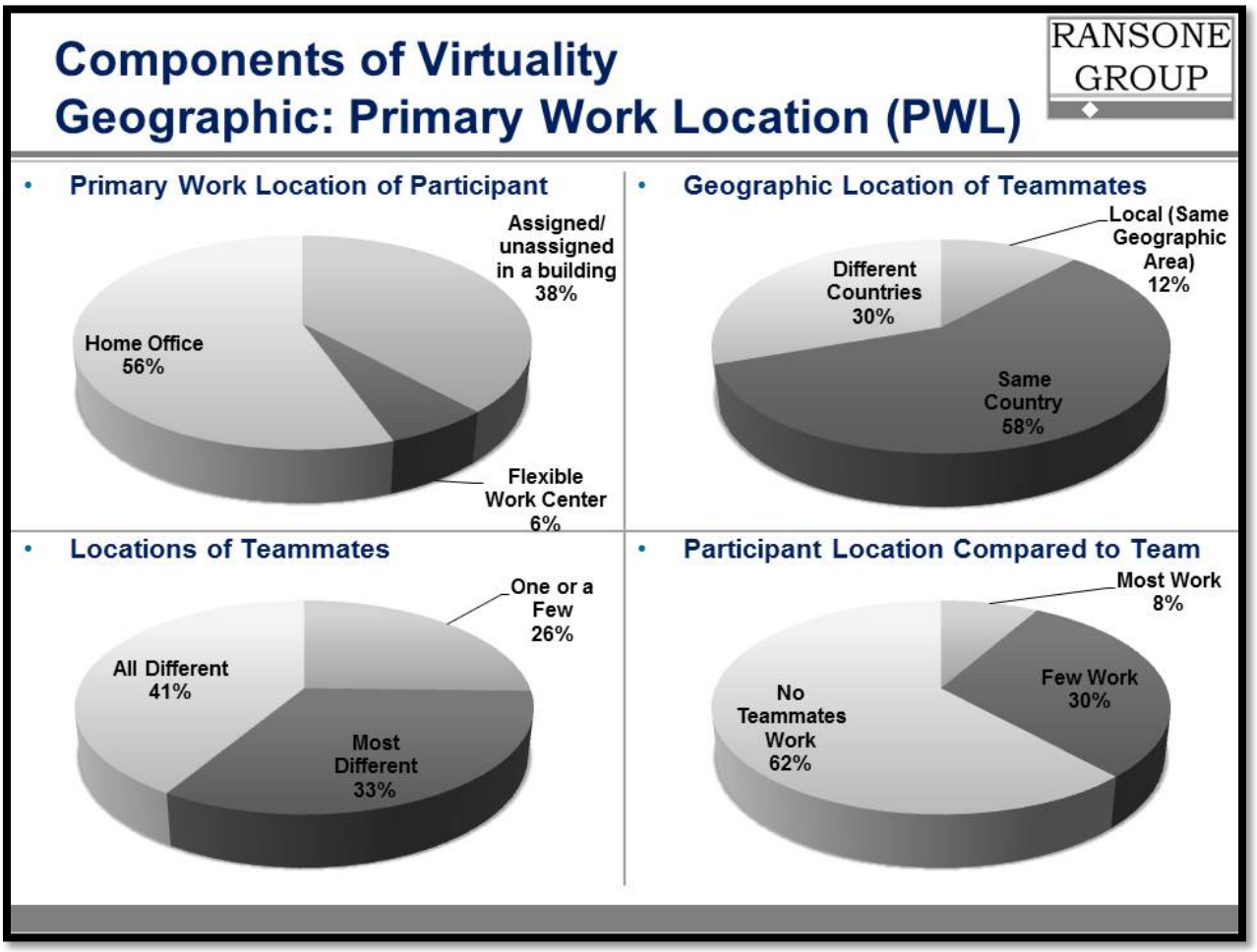
Respondents were asked to rate their level of virtuality (overall, geographic, interaction, and technology tools) on a 10-point scale where *1=Not at All Virtual and 10=Extremely Virtual*. Data were acquired about how the teams interacted and how the respondent spent his/her time. A full 38% of the respondents indicated they had not met face-to-face with all or the majority of their teammates. Commentary provided by the respondents indicated that there is significant benefit to meeting face-to-face. The majority of the respondent's time was spent in performing tasks individually (51%) or communicating with others virtually (37%). (See Figure 10.)

Figure 10: Perceived Virtuality and Interaction



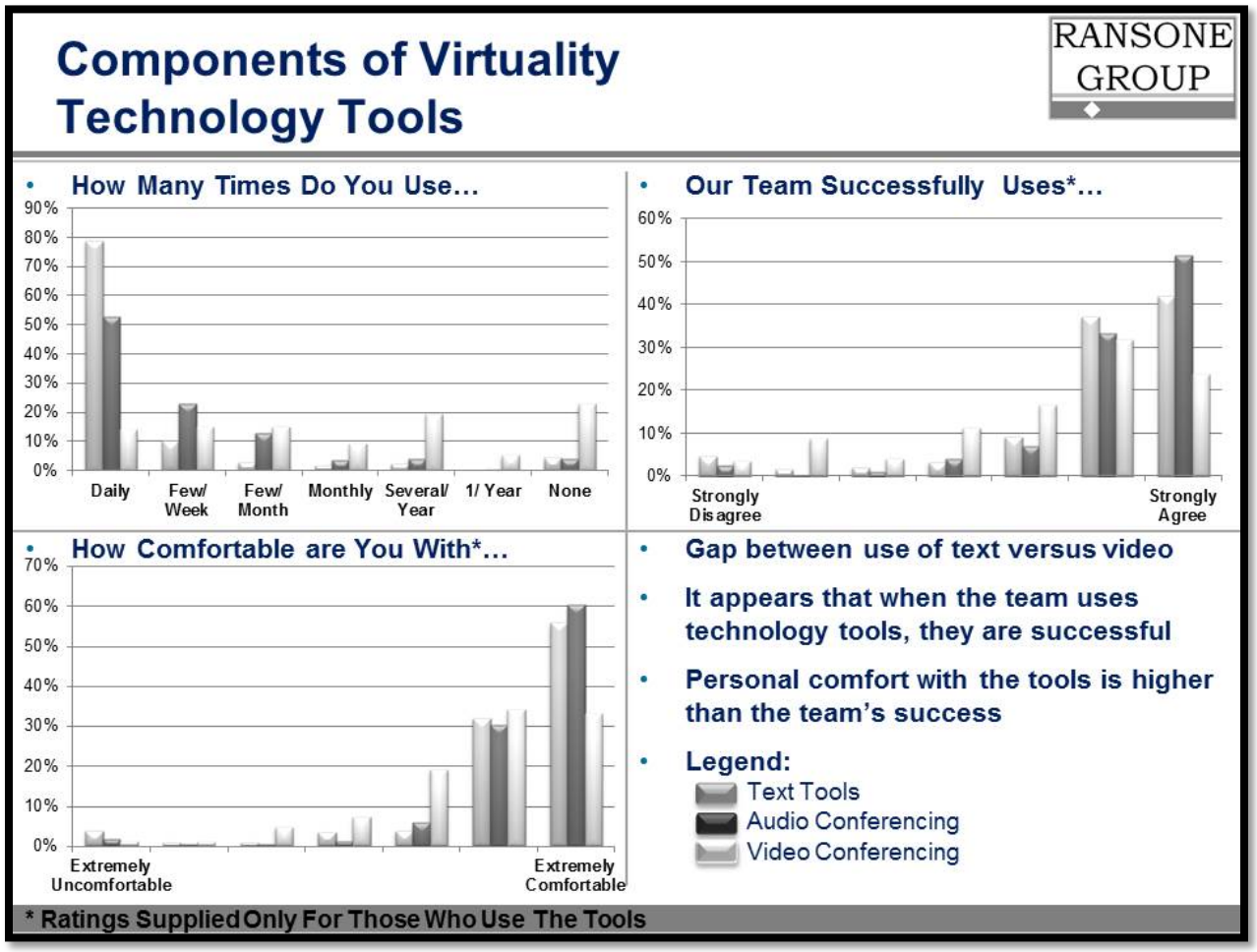
The next type of data acquired was in the area of primary work locations of the respondent and teammates. The majority (56%) of the respondents worked from home offices. The geographic locations of the teams were primarily (58%) within the same country. The locations of teammates were primarily all different (41%) or mostly different (33%). Respondents were primarily in locations (62%) where no other teammates were located. (See Figure 11.)

Figure 11: Primary Work Location Overview



The last area measured included the respondent's assessment as to what types of technology tools were utilized, how successful the team was in using the tools, and how comfortable the respondent was in using the tools. Text tools were the most frequently used tools. Commentary provided by the respondents indicated that video was not as available as they would prefer. (See Figure 12.)

Figure 12: Technology Tools



Summary

The importance of high-quality relationships has been identified in a number of forums. Development of the RHI-TEAMW to measure relationship quality, applying Relational Cultural Theory in virtual work environments is a new instrument available for research. The most impactful factor to positively affect perceived success is relationship. And relationship existence lags behind the perceived importance of high-quality relationships. Specific demographics have been identified as significantly different in relationships (team role and country/cultural background). Additional virtual team profiles have been provided to enlighten both practitioners and researchers regarding the variation within the virtual continuum. Clearly additional research is warranted; however this study has contributed immensely to the body of knowledge.

Researcher Background

Carol Locher Ransone, Ph.D., is the founder and principal of The Ransone Group, LLC. She is experienced in managing in a virtual work environment and leading organizations to effectively incorporate alternative work options. Ransone is an MBA graduate from Queens University in Charlotte, NC, and received her Ph.D. in Leadership and Change from Antioch University. Please see www.RansoneGroup.com for additional information.

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Appendix M

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